OFFSITE DRAINAGE REPORT

for

The Dysart Ranch Subdivision

NW 1/4 Sec 27 T2N R1E

June 12, 2002

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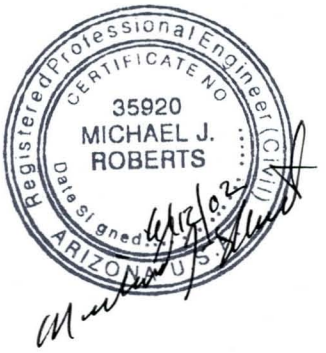

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1.0 Introduction

Dysart Ranch is a 118-acre single family residential subdivision planned along the north side of the Roosevelt Irrigation District (RID) Canal and along the west side of Dysart Road in Avondale, Arizona. The subdivision is located in the northwest 1/4 of Section 27, T2N, R1E. Refer to Figure 1 for the Vicinity Map. The off-site drainage area consists of approximately 2.9 mi^2 of developed and developing land. The majority of the existing development is residential but there are also several small commercial parcels.

The purpose of this report is to document the hydraulic design of the offsite drainage structures associated with the subdivision construction. Currently the site is adjacent to three significant drainage channels. They are: the Dysart Road Channel, the Roosevelt Irrigation District (RID) Canal Channel and the Plaza Circle Channel. These channels will all be preserved and improved, as necessary, to increase conveyance and provide erosion protection. In addition, the adjacent detention basin (at the southwest corner of the subdivision) will be deepened to increase storage capacity. With one exception, these drainage structures were constructed by the Flood Control District of Maricopa County (FCDMCMC). The exception is the Dysart Road Channel. It was designed and built by the Maricopa County Department of Transportation (MCDOT) for the Dysart Road paving project. They are all intended to reduce the flood hazard to the surrounding area. The flood hazard is caused by stormwater from the north ponding behind by the elevated RID Canal that runs east to west along the southern boundary of the subdivision.

1.1 Existing Floodplain

The south 18 acres of the proposed subdivision lie within a Federal Emergency Management Association (FEMA) Flood Hazard Zone AH, with Base Flood Elevation of 1013 ft. as shown on FIRM Panel Number 04013C2080G, dated September, 1995, revised January 2002 by a Letter of Map Revision (LOMR).

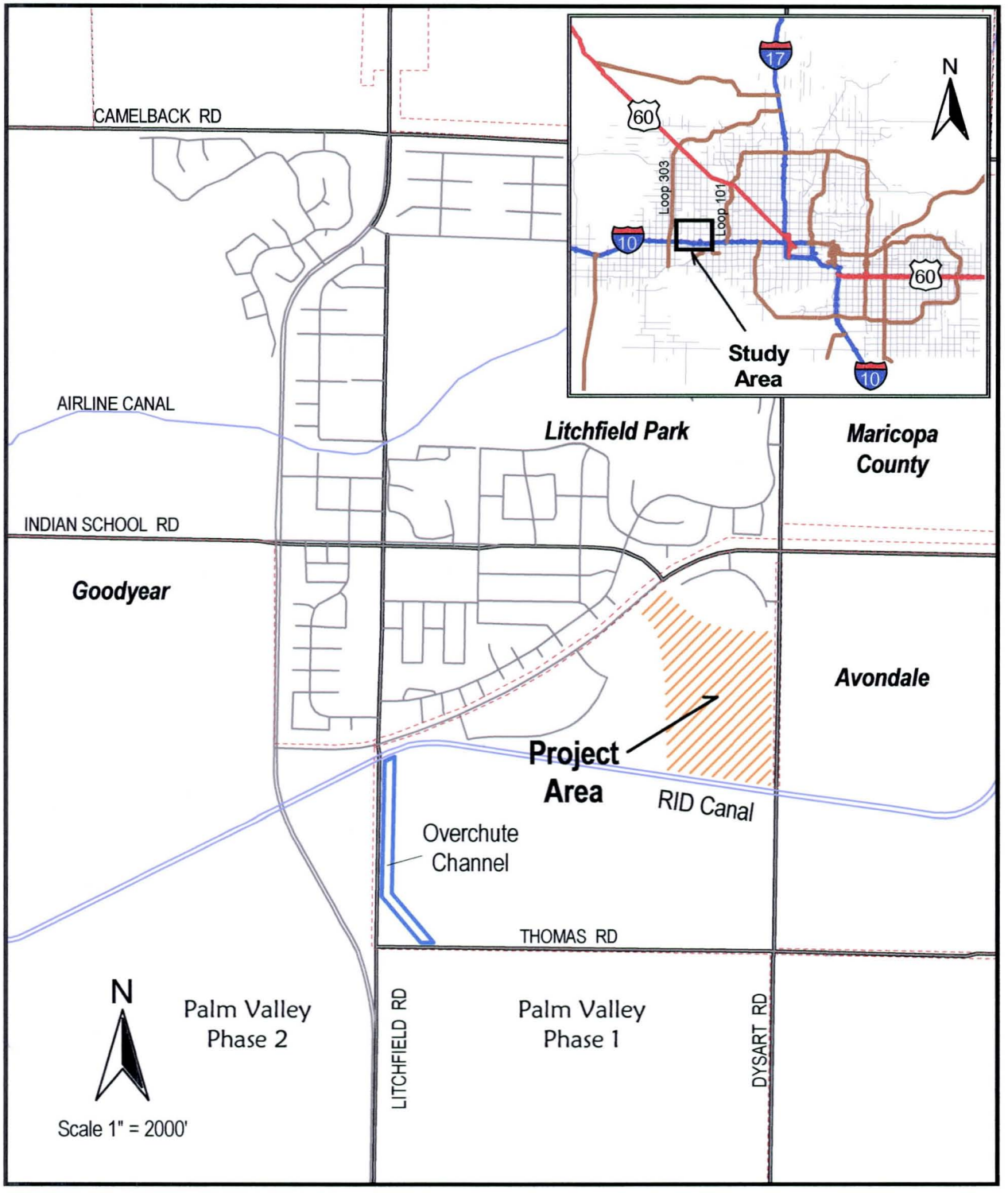

Figure 1

Dysart Ranch Vicinity Map

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2.0 Hydrologic Analysis

Two HEC-1 models were developed for this project, a 100-year, 6-hour, and a 100-year, 24-hour model. The 6-hour model was used as a basis for designing the drainage structures adjacent to the new subdivision. The 24-hour model was used to ensure that the new subdivision and its associated construction do not adversely impact the surrounding properties.

HEC-1 Model Parameters:

100-year, 24-hour, S-Graph for the unit hydrograph
100-year, 6-hour, Clark Method for the unit hydrograph.
Both models use the Green and Ampt rainfall loss method.
Both models use the Normal Depth for hydrograph routing.

Existing Studies:

A large part of the watershed has been previously modeled and has not changed hydrologically. However, a significant amount of development has occurred in the last year or two that necessitate revisions to the existing models. Two existing HEC-1 models were used as basis for this project. The first is the 100-year, 24-hour FCDMC model for the RID Canal overchute design (References, No. 2) and the second is the 100-year, 6-hour model for the offsite flow for the Sage Creek development (References, No. 7).

Changes to these models include:

FCDMC Model

1. Existing condition subbasins 256, 257, 2712 were modified due to the addition of onsite retention with new development. On site retention for most of 256 and 257 is for the 100-year, 6-hour volume(reference 6).
2. Subbasin 2712 was divided into 4 separate basins 12A, 12B, 12C and 12D.
3. The volumes in the storage route SR2712 were modified to reflect the deeper basin proposed for this subdivision.
4. The outflow rating curve for SR2712 was modified using a new HEC-RAS model as the basis for the stage-discharge part of the operation.
5. Two new subbasins were added north of the Sage Creek development. These were delineated in the Sage Creek report and were included in this analysis. New routing cards and divert cards were added at CP256 to reflect the flow paths for the existing storm drains and weir flow over the roadway.

Sage Creek Report

1. Only a portion of this analysis was used in the Dysart Ranch HEC-1 model. This includes the diverts and routing operations at CP256, the onsite 6-hour hydrographs for the Sage Creek subdivision and the 6-hour storm hydrographs for subbasins SUB6 and SUB7.

Existing vs. Developed Conditions

Two HEC-1 models were developed, an existing conditions and a developed conditions model. The peak discharges from these models were then compared to determine if the new development would create a worse situation than in existing conditions.

The existing condition hydrologic parameters for those subbasins currently under construction, such as the subdivision north of Indian School Road in subbasins 256 and 257, were included in the existing conditions model.

The developed conditions model is the same model as the existing conditions, except new runoff parameters for Dysart Ranch (subbasins 12A, 12B, 12C), and the storage basin volumes were modified due the additional storage for the retention requirement.

6-Hour vs. 24-hour Storms

Two 100-year HEC-1 models were developed, a 24-hour and a 6-hour. The 6-hour model peak discharges were used to design the offsite drainage structures adjacent to the subdivision. The 24-hour storm was developed to determine if the new subdivision would cause an additional flood hazard to existing drainage system associated with the RID Canal overchute.

3.0 Hydraulic Design

The proposed drainage structures are designed using the 100-year, 6-hour peak discharges from the DYR.6I HEC-1 model. Two HEC-RAS models were developed to design the proposed channels and culverts crossings for the subdivision. HEC RAS parameters:

Manning's "n": 0.028 for the earthen channels
0.022 for bank protected sections of the channels
0.013 for the concrete channel sections (overchute only)

Expansion/Contraction Coefficients: 0.1/0.3 normal channel section, 0.3/0.5 at the culvert sections.

Culvert Analysis: HEC RAS software set to highest the loss equations.

Section 3.1 through 3.2 are brief descriptions of the specific channel and culvert design. Refer to Exhibits 3 and 4 for the HEC-RAS cross section locations and Appendix 2 for HEC-RAS model output.

3.1 Dysart Road and RID Canal Channel and Culverts

The existing earthen channel along Dysart Road will remain in place as an open channel. The channel's existing slope is approximately 0.23%. Cross sections were taken using the proposed Dysart roadway section including the new sidewalk. The typical channel section has 4H:1V side slopes, 15ft –20ft bottom width and is offset two feet from the proposed sidewalk. The channel flow depth varies from 2.0 ft on the north end to 4.4 ft at the Osborn Road culvert crossing. Velocities range from 6 fps on the upstream end to 2 fps within the main channel. Since the north end velocities are above 5 fps, which is considered to be erosive, bank protection is required. Additional bank protection will be provided on the upstream and downstream ends of the all the culverts, at the bend in the channel along the RID Canal, and at the channel outlet in the retention area. A specific type of bank protection has not been decided yet. It will need to be able to protect against velocities ranging from 5 fps to 7 fps.

The existing 3-42" RGRCP's at Osborn Road do not convey the 100 year flow without overtopping and spilling into Dysart Road. Therefore, a new double barrel 8' x 4' concrete box culvert crossing will used at Osborn Road. The upstream high water elevation is 1014.1 ft., which is approximately 1.0 ft below the top of the curb on Dysart Road.

The RID Canal Channel is at the downstream end of the Dysart Road Channel. This portion has a 100-year, 6-hour flow of 611 cfs. Cross sections were taken

capacity design

using the proposed subdivision grading and existing grades along the RID Canal bank. The existing channel invert will be lowered approximately 1 foot at the downstream end and will match existing ground at the upstream end (at the bend).

A future roadway crossing is also planned for this part of the channel. Constructing this crossing is not part of the Dysart Ranch project, but should be addressed to ensure that future development and the City staff know what to expect for the culvert size. This culvert should be a double barrel 12ft x 5ft CBC to convey the 100-year, 6-hour flows of 611 cfs without over topping the channel banks.

3.2 Plaza Circle Channel

The Plaza Circle Channel is along the west side of Dysart Ranch and drains stormwater runoff from much of Litchfield Park. The channel is adjacent to Indian School Road, Plaza Circle Drive and the subdivision. There are two roadway crossings that require culverts. In addition, the channel section is somewhat modified with this project.

The majority of the runoff enters the channel by sheet flowing south across Indian School Road and then spilling into the channel. The 100-year, 6-hour peak discharge at the upstream end of the channel is 713 cfs. A small portion (about 28 cfs) of this runoff flows out of Litchfield Park through 4-18 inch RGRCP's under Indian School Road then into the upstream end of the Plaza Circle Channel. The remaining flow simply spills into the channel as surface flow over Indian School Road.

From field visits and topographic mapping it appears that runoff flowing out of Litchfield Park at Cascada Road generally sheet flows to the south and west into the Plaza Circle Channel. 132nd Avenue will be extended to Indian School Road across from Cascada Road. Part of the Dysart Ranch project is to design this section of Indian School Road. The roadway needs to be designed and sloped to direct the runoff coming out of Cascada Road into the Plaza Circle Channel south of 132nd Avenue. It appears that a majority of the runoff already flows in this direction. Additionally, 132nd Avenue south of the Indian School Road needs to include a high point-grade break to ensure runoff from Litchfield Park does not enter the new subdivision.

132nd Avenue will need 2- 36" RGRCP culverts to convey the 100-year, 6-hour peak discharge (82cfs) from the contributing drainage area to the east. The drainage area is an existing church site that is currently being expanded. The 4-18" pipe culverts from Litchfield Park are upstream of the 132nd Avenue pipes. They will drain into the existing channel and then through the 132nd Avenue pipes.

The north channel bank downstream of 132nd Avenue needs to be protected, to ensure that runoff sheet flowing across Indian School Road does not erode the existing banks and potentially wash out part of Indian School Road. The limits of bank protection are shown on Exhibit 3.

The existing Plaza Circle Channel is trapezoidal with approximately 4H:1V side slopes, an average bottom width of approximately 40 feet and an average depth of 6 ft to 7ft. The developed conditions peak discharge in the channel is 713 cfs at the upstream end and 800 cfs at the Osborn Road culvert crossing. The channel slope will be modified from approximately 0.08% to 0.2% by lowering the downstream end to elevation 1008.0 (approximately 1ft) and matching the existing upstream elevation at the 132nd Avenue culvert's elevation of 1011.6.

Additional modifications include adding a new 5-ft sidewalk at the downstream end of the channel. This channel portion will be regraded to have 6H:1V side slopes and an area for the new sidewalk.

The Osborn Road crossing will need 2- 12'x 5' concrete box culverts to convey the 100-year, 6-hour, peak discharge. Results from the HEC-RAS model show that the culverts are in inlet control with a headwater elevation of 1014.41. The adjacent FFE is 1015.56 and the top of curb on Plaza Drive is 1015.65, both of which are more than 1 ft above the high water elevation.

Upstream of the Osborn Road culverts are several lots that encroach into the existing channel. A portion of this section of the channel will be filled and graded with 4H:1V side slopes. The cross sections in the HEC-RAS model were modified to include the reduced channel width.

The new retention basin is located at the downstream end of the Plaza Circle Channel. Therefore, to protect the channel from being head cut, bank protection will be required as shown in Exhibit 4.

4.0 Stormwater Retention and Floodplain Replacement Volumes

The subdivision will provide 100-year, 2-hour stormwater retention within the existing storage basin along the west side of the site (refer to Exhibit 2). The basin bottom will be lowered approximately 2½ feet to elevation 1003.5. The existing channel invert at the outlet is at El. 1006.5, therefore total depth is 3 feet. The basin will be drained using a combination of drywells and percolation and will drain in 36 hours. The number of drywells required will depend on the basin percolation rate. The owner will need to verify this prior to final design. Total retention required is 16.5 ac-ft. (References, No. 7), total volume provided is 16.5 ac-ft.

The new subdivision will be constructed within a FEMA ponding floodplain. In order to obtain the LOMR, the subdivision must replace the ponded volume that is displaced by the new construction. The existing volume displaced is 20.1 ac-ft. However, the subdivision will be providing 16.5 ac-ft for retention. The storage basin had 34.64 ac-ft at elevation 1012 ft. according to the original FCDMC HEC-1 model for the RID canal overchute study (References, No. 2). Using recent as-built mapping, it was determined that the actual basin volume is 55.2 ac-ft at elevation 1012ft. This is an increase of 20.5 ac-ft. In order to grade the basin to get required retention volume a significant portion of the existing storage basin will be graded. Because of this, the volume of the entire basin will become even greater above elevation 1007 ft. This additional volume was not included in the subdivisions retention basin volume provided requirement because it is above the outfall elevation of 1006.5 ft. When combined with the grading required for the new retention basin there is approximately 80.5 ac-ft of storage at elevation 1012 ft. This is an increase of 25.3 ac-ft from existing conditions and an additional 45.9 ac-ft when compared to the original FCDMC study. Therefore, the subdivision is providing the required replacement volume. Refer to Appendix 3 for the basin volume calculations.

BASIN VOLUME FOR HEC-1 AND 6
CHANNEL ENTER 100.

5.0 Results of Analysis

Four HEC-1 models were created to compare the existing condition hydrology verses the developed conditions hydrology. They are the 100-year, 24-hour and 100-year, 6-hour existing and developed conditions storms. Refer to Table 5.0 for a summary of the results.

5.1 24-Hour Storm Results

The peak discharges remained the same at the concentration points where flow was not impacted by the development. Peak discharges for CP12A, 1I12C went down in the developed conditions model. This is due to the increased time of concentration from subbasin 12A. The peak flow from 12A ran off before the peak inflow from Litchfield Park did. Concentration point CP12B (Osborn Rd. and Plaza Circle Channel) had an 8% higher peak discharge in the developed conditions. Both flows will overtop the designed culverts, However, this channel has been designed to convey the developed condition 6-hr storm peak flow. The peak flow at concentration point CP12C is 6% higher than in existing conditions. This occurs inside the storage basin and is a combination of three flows at three different points which technically do not affect each other or the high water elevation in the storage basin. HEC-1 nodes SR12C and LITCH both went down in developed conditions. This is due to the increased storage provided in the basin by the new subdivision.

5.2 6-Hour Storm Results

Concentration point CP12A increased 9% from existing conditions. The times of concentration were closer in the 6-hour storm than in the 24-hour storm therefore, the peak discharges increased slightly in developed conditions. CP12A is at the new Osborn Road and Dysart Road culverts. From our HEC-RAS analysis, the proposed box culverts can pass the developed conditions flows without spilling into Dysart Road or into the new subdivision. It should be noted that the existing 42" RCP's were designed to convey 238 cfs. They would cause runoff to spill on to Dysart Road during the design storm. Therefore, the 2-8'x 4' CBC's will provide flood protection for Dysart Road even though the peak discharge is higher in developed conditions. The peak discharge in the RID Canal Channel increased 4 % from existing conditions. The channel and culverts have been designed to convey the developed condition flows and, since this is on private property, the increase will should not adversely impact adjacent properties. Concentration CP12B increased 1% from existing conditions. The channel and culverts have been designed to contain this flow. The adjacent properties will not be adversely impacted. The inflow to storage basin increased 9% from existing conditions. As in the 24-hour model, this HEC-1 Node is a combination of three inflows into a large storage basin. They do not actually combine until after flow though the basin, therefore, there will not be an adverse

impact due to this increase. The outflow from the storage basin decreased 22%. This is due to the increase storage volume provided by the subdivision.

Table 5.0
Summary of 100-Year Peak Discharges

HEC-1 Node	Existing Cond. 24Hr. (cfs)	Existing Cond. 6Hr (cfs)	Developed Cond. 24Hr. (cfs)	% Change from Existing conditions (24hr.)	Developed Cond, 6Hr (cfs)	% Change from Existing conditions (6hr.)	Original Design Flow (cfs)	Location
RCPSUB6	335	336	335	0	336	0	238	Upstream end of the Dysart Road Channel
CP12A	437	361	408	-7	394	9	238	Dysart Road Channel at the Osborn Road Culverts
1I12C	476	586	456	-4	611	4	476	Dysart Road Channel at the RID Canal
CP255A	1161	713	1161	0	713	0	1161	Upstream End of the Plaza Circle Channel
CP12B	1169	788	1265	8	799	1	1161	Plaza Cicle Channel at Osborn Road
CP12C	1547	980	1637	6	1071	9	1746	Peak inflow the storage basin
SR12C	934	710	878	-6	551	-22	1084	Peak discharge out of the storage basin
LITCH	1335	N/A	1164	-13	N/A		1357	Peak discharge at the RID Canal Over-chute

Table 5.1
Summary of New Drainage Structures

HEC-1 Node	Design	Structure
CP12A	394	2-8' x 4' Concrete Box Culvert Osborn and Dysart Roads
CP12B	799	2- 12' x 5'Concrete Box Culvert Osborn Road and Plaza Circle Channel

7. References

1. *White Tanks/Agua Fria ADMS*, by the FCDMC, dated May, 1992.

2. *Hydrologic Analysis for Roosevelt Irrigation District Canal Overchute at Litchfield Road*, by FCDMC, dated 1995.

3. *Dysart Road Work Order No. 68644*, by MCDOT, dated July, 1992.

4. *Revision for: The RID Canal Overchute Hydrologic Mode*l, by the WLB Group dated May, 1999, revised June, 1999, (the Sage Creek subdivision Off-site Report).

5. *Palm Valley Master Drainage Study*, by The WLB Group, dated August, 1998.

6. *Drainage Report for Wigwam Creek-South Offsites, SEC of Camelback Road and Dysart Road Arizona*, by CMX, dated January 8, 2002.

7. *Preliminary Drainage Report for Dysart Ranch*, by Keogh Engineering, dated April, 2002.

6.0 Conclusions

1. The proposed channels and culverts surrounding the Dysart Ranch Subdivision will convey the 100-year, 6-hour flood flows with improvements as specified in this report.

2. The developed condition peak discharge leaving the site is lower than the existing condition peak discharge and significantly lower than the design peak discharge developed by the Flood Control District of Maricopa County. The peak discharge is reduced by deepening the existing stormwater storage basin.

3. The proposed finish floor elevations are above the 100-year, 6-hour water surface elevation.

4. The developed condition peak discharge through the RID Canal overchute is lower than the existing condition peak discharge.

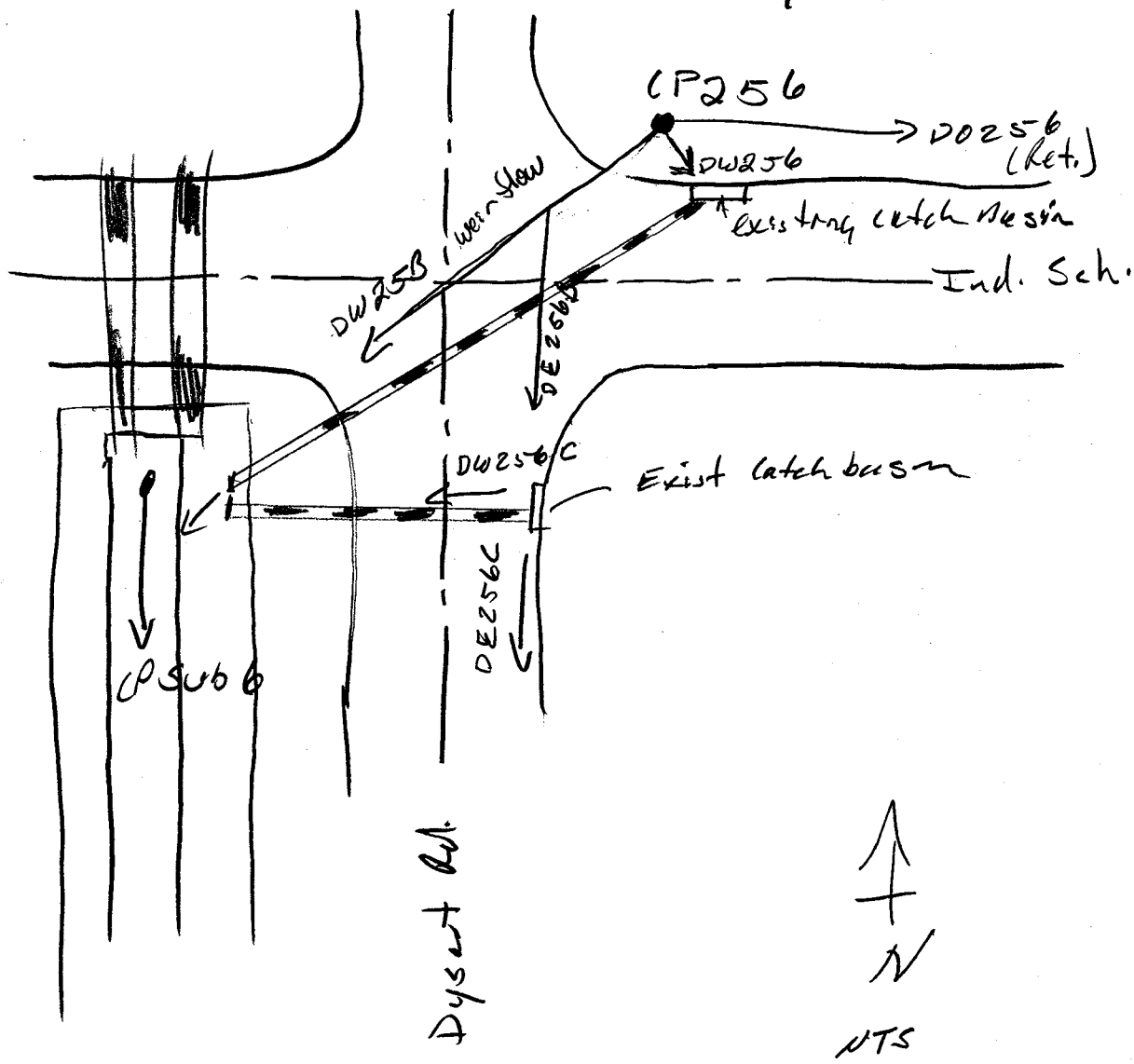
5. The new box culverts under Osborn Road at Dysart Road will eliminate the existing flood hazard due to the fact that the existing pipe culverts are undersized.

6. The design of Indian Schoool Road at 132nd Avenue will require careful consideration due to runoff that spills over Indian School Road from Litchfield Park. The roadway will need to be designed to ensure that the peak discharge of 700 cfs is forced to flow westerly into the Plaza Circle Channel. Otherwise, it could enter the Dysart Ranch subdivision and present a flood hazard.

APPENDIX 1.0
HYDROLOGIC DATA/HEC-1 OUTPUT

Project Title Dysart Ranch Project No 302008 Date

Subject HEC-1 Exhibit Prepared By MJB Checked By Page



LOSS PARAMETERS FOR SUBBASIN: 2712a

Existing Cond.

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	39.200	86.4	0.05	0
LB	6.160	13.6	0.40	0

TOTAL = 45.360 Acres XKSAT = 0.07 %Rock = 0

DTHETA

Dry = 0.30 PSIF = 8.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
45.360	Desert	100.	DRY	20	0	0.35	0.05	Low	0.06
	RES		NORMAL	50	20	0.12	0.03	Low	
	Comm		DRY	10	90	0.06	0.03	Min	
	Golf		NORMAL	50	0	0.50	0.03	Min	
45.360 = Total Area			Avg. =	20	0%	0.350			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.30

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.08

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
2712a	0.071	1.600	0.057	15.0	0.35	0.30	8.00	0.08	0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
2712a	0.071	0.56	0.26	0.05	10.7	0.35	0.30	8.00	0.08	0	22

Exist. Cond.

LOSS PARAMETERS FOR SUBBASIN: 2712b

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	41.570	81.1	0.05	0
GT	0.931	1.8	0.04	0
ES	8.745	17.1	0.25	0

TOTAL = 51.250 Acres XKSAT = 0.07 %Rock = 0

DTHETA

Dry = 0.30 PSIF = 8.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
51.250	Desert	91.9	DRY	20	0	0.35	0.05	Low	0.06
	RES		NORMAL	50	20	0.12	0.03	Low	
4.500	Comm	8.1	DRY	10	90	0.06	0.03	Min	0.04
55.750 = Total Area			Avg. =	20	7%	0.330			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.30

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.08

IMPERVIOUS AREA: URBAN @ 100 % effective = 7
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 7

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
2712b	0.080	0.540	0.054	11.0	0.33	0.30	8.00	0.08	7

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
2712b	0.080	0.54	0.21	0.05	29.6	0.33	0.30	8.00	0.08	7	10

Exist Cond.

LOSS PARAMETERS FOR SUBBASIN: 2712c

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
LCA	7.380	7.6	0.25	0
ES	32.980	33.9	0.25	0
VA	21.860	22.5	0.39	0
GT	11.460	11.8	0.04	0
LB	7.370	7.6	0.40	0
MR	16.180	16.6	0.05	0
TOTAL =	97.230 Acres		XKSAT = 0.18	%Rock = 0

DTHETA

Dry = 0.38 PSIF = 5.60
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
51.470	Desert	52.9	DRY	20	0	0.35	0.05	Low	0.06
	RES		NORMAL	50	20	0.12	0.03	Low	
45.760	Comm	47.1	DRY	10	90	0.06	0.03	Min	0.03
	Golf		NORMAL	50	0	0.50	0.03	Min	
	RowCrop		WET	90	0	0.50	0.12	Hi	
97.230 = Total Area			Avg. =	19	42%	0.210			

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.38

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.20

IMPERVIOUS AREA: URBAN @ 100 % effective = 42
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 42

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %
2712c	0.152	0.570	0.041	7.0	0.21	0.38	5.60	0.20	42

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
2712c	0.152	0.53	0.04	0.04	7.5	0.21	0.38	5.60	0.20	42	9

Exist. Cond.

LOSS PARAMETERS FOR SUBBASIN: 2712d

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
LB	0.717	5.0	0.40	0
LCA	2.670	18.6	0.25	0
TU	5.010	34.9	0.25	0
MP	5.960	41.5	0.25	0
TOTAL =	14.360 Acres		XKSAT = 0.26	%Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP%	IA in.	Kn	Kb Type	Kb
	Desert		DRY	20	0	0.35	0.05	Low	
	RES		NORMAL	50	20	0.12	0.03	Low	
14.360	Comm	100.	DRY	10	90	0.06	0.03	Min	0.03
	Golf		NORMAL	50	0	0.50	0.03	Min	
	RowCrop		WET	90	0	0.50	0.12	Hi	
14.360 = Total Area			Avg. =	10	90%	0.060			

PERCENT OF SUBBASIN DRY = 50.0 %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.17

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.26

IMPERVIOUS AREA: URBAN @ 100 % effective = 90
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 90

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA	PSIF	XKSAT adj.	RTIMP %	Lag min.
2712d	0.022	0.27	0.13	0.01	11.1	0.03	0.17	4.70	0.26	90	4

LOSS PARAMETERS FOR SUBBASIN: 2712a

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	39.200	86.4	0.05	0
LB	6.160	13.6	0.40	0

TOTAL = 45.360 Acres XKSAT = 0.07 %Rock = 0

DTHETA

Dry = 0.30 PSIF = 8.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg.	RTIMP% in.	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
25.060	RES	55.2 NORMAL	50	20	0.12	0.03 Low	0.06		
20.300	Comm	44.8 DRY	10	90	0.06	0.03 Min	0.03		
	Golf	NORMAL	50	0	0.50	0.03 Min			

45.360 = Total Area Avg. = 46 51% 0.090

PERCENT OF SUBBASIN DRY = 45.0 %
NORMAL = 55.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.22

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.10

IMPERVIOUS AREA: URBAN @ 100 % effective = 51
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 51

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
2712a	0.071	1.600	0.022	15.0	0.05	0.22	8.00	0.10	51

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn in.	Slope	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %	Lag min.
2712a	0.071	0.56	0.26	0.01	10.7	0.05	0.11	8.00	0.10	51	7

LOSS PARAMETERS FOR SUBBASIN: 2712b

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	41.570	81.1	0.05	0
GT	0.931	1.8	0.04	0
ES	8.745	17.1	0.25	0

TOTAL = 51.250 Acres XKSAT = 0.07 %Rock = 0

DTHETA

Dry = 0.30 PSIF = 8.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg.	RTIMP% in.	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
46.750	RES	91.2 NORMAL	50	20	0.12	0.03 Low	0.06		
4.500	Comm	8.8 DRY	10	90	0.06	0.03 Min	0.04		

51.250 = Total Area Avg. = 50 26% 0.110

PERCENT OF SUBBASIN DRY = 9.0 %
NORMAL = 91.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.16

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.10

IMPERVIOUS AREA: URBAN @ 100 % effective = 26
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 26

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope	IA in.	DTHETA adj.	PSIF	XKSAT	RTIMP %
2712b	0.080	0.540	0.054	11.0	0.11	0.16	8.00	0.10	26

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn	Slope	IA in.	DTHETA adj.	PSIF	XKSAT	RTIMP %	Lag min.
2712b	0.080	0.54	0.21	0.03	29.6	0.11	0.16	8.00	0.10	26	10

LOSS PARAMETERS FOR SUBBASIN: 2712c

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
LCA	7.380	7.6	0.25	0
ES	32.980	33.9	0.25	0
VA	21.860	22.5	0.39	0
GT	11.460	11.8	0.04	0
LB	7.370	7.6	0.40	0
MR	16.180	16.6	0.05	0

TOTAL = 97.230 Acres XKSAT = 0.18 %Rock = 0

DTHETA

Dry = 0.38 PSIF = 5.60
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP% Type	IA	Kn	Kb	Kb
22.070	Desert	22.7 DRY	20	0		0.35	0.05	Low	0.06
29.400	RES	30.2 NORMAL	50	20		0.12	0.03	Low	0.06
45.760	Comm	47.1 DRY	10	90		0.06	0.03	Min	0.03
	Golf	NORMAL	50	0		0.50	0.03	Min	
	RowCrop	WET	90	0		0.50	0.12	Hi	

97.230 = Total Area Avg. = 33 48% 0.140

PERCENT OF SUBBASIN DRY = 70.0 %
NORMAL = 30.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.34

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.23

IMPERVIOUS AREA: URBAN @ 100 % effective = 48
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 48

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca	Kn	Slope ft/mi	IA in.	DTHETA adj.	PSIF	XKSAT	RTIMP %	Lag min.
2712c	0.152	0.53	0.04	0.04	7.5	0.14	0.34	5.60	0.23	48	8

LOSS PARAMETERS FOR SUBBASIN: 2712d

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT Outcrop	% Rock
LB	0.717	5.0	0.40	0
LCA	2.670	18.6	0.25	0
TU	5.010	34.9	0.25	0
MP	5.960	41.5	0.25	0

TOTAL = 14.360 Acres XKSAT = 0.26 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.70
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP%	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
	RES	NORMAL	50	20	0.12	0.03 Low			
14.360	Comm	100. DRY	10	90	0.06	0.03 Min	0.03		
	Golf	NORMAL	50	0	0.50	0.03 Min			
	RowCrop	WET	90	0	0.50	0.12 Hi			

14.360 = Total Area Avg. = 10 90% 0.060

PERCENT OF SUBBASIN DRY = 50.0 %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.17

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.26

IMPERVIOUS AREA: URBAN @ 100 % effective = 90
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 90

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn in.	Slope	IA adj.	% DTHETA	PSIF	XKSAT	RTIMP	Lag min.
2712d	0.022	0.27	0.13	0.01	11.1	0.03	0.17	4.70	0.26	90	4

LOSS PARAMETERS FOR SUBBASIN: 256

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MP	5.800	4.9	0.25	0
GGA	6.800	5.8	0.25	0
LCA	10.000	8.5	0.25	0
GXB	1.900	1.6	0.24	0
MR	71.000	60.4	0.05	0
LB	17.200	14.6	0.40	0
ES	4.900	4.2	0.25	0

TOTAL = 117.600 Acres XKSAT = 0.10 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 7.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP%	IA	Kn	Kb	Kb Type
	Desert	DRY	20	0	0.35	0.05	Low		
44.000	RES	37.4 NORMAL	50	20	0.12	0.03	Low	0.06	
73.600	Comm	62.6 DRY	10	90	0.06	0.03	Min	0.03	
	Golf	NORMAL	50	0	0.50	0.03	Min		
	RowCrop	WET	90	0	0.50	0.12	Hi		

117.60 = Total Area Avg. = 43 64% 0.080

PERCENT OF SUBBASIN DRY = 63.0 %
NORMAL = 37.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.28

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.14

IMPERVIOUS AREA: URBAN @ 100 % effective = 64
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 64

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
256	0.184	1.070	0.036	21.0	0.08	0.28	7.00	0.14	64

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn in.	Slope	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %	Lag min.
256	0.184	1.07	0.38	0.03	21.0	0.08	0.28	7.00	0.14	64	17

LOSS PARAMETERS FOR SUBBASIN: 257

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT Outcrop	% Rock
LB	217.600	100.	0.25	0

TOTAL = 217.600 Acres XKSAT = 0.25 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 4.80
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP% Type	IA	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05	Low		
217.600	RES	100. NORMAL	50	20	0.12	0.03	Low	0.05	
	Comm	DRY	10	90	0.06	0.03	Min		
	Golf	NORMAL	50	0	0.50	0.03	Min		

217.60 = Total Area Avg. = 50 20% 0.120

PERCENT OF SUBBASIN DRY = 0.0 %
NORMAL = 100. %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.36

IMPERVIOUS AREA: URBAN @ 100 % effective = 20
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 20

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
257	0.340	1.210	0.048	12.0	0.12	0.25	4.80	0.36	20

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn in.	Slope	IA	DTHETA adj.	PSIF	XKSAT %	RTIMP min.	Lag
257	0.340	1.21	0.61	0.03	11.6	0.12	0.25	4.80	0.36	20	24

LOSS PARAMETERS FOR SUBBASIN: 255A

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	382.000	100.	0.16	0

TOTAL = 45.360 Acres XKSAT = 0.07 %Rock = 0

DTHETA

Dry = 0.30 PSIF = 8.00
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg.	RTIMP% in.	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
247.000	RES	64.7 NORMAL	50	20	0.12	0.03 Low	0.05		
	Comm	DRY	10	90	0.06	0.03 Min			
135.000	Golf	35.3 NORMAL	50	0	0.50	0.03 Min	0.03		

45.360 = Total Area Avg. = 46 51% 0.090

PERCENT OF SUBBASIN DRY = 45.0 %
NORMAL = 55.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.22

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.10

IMPERVIOUS AREA: URBAN @ 100 % effective = 51
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 51

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
255A	0.597	1.600	0.019	15.0	0.13	0.12	5.80	0.23	13

LOSS PARAMETERS FOR SUBBASIN: 271A1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	29.500	52.0	0.05	0
LCA	27.200	48.0	0.25	0

TOTAL = 56.700 Acres XKSAT = 0.11 %Rock = 0

DTHETA

Dry = 0.36 PSIF = 6.80
Normal = 0.17
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP%	IA	Kn	Kb	Kb Type
	Desert	DRY	20	0	0.35	0.05			Low
	RES	NORMAL	50	20	0.12	0.03			Low
	Comm	DRY	10	90	0.06	0.03			Min
	Golf	NORMAL	50	0	0.50	0.03			Min
56.700	RowCrop	100. WET		90	0	0.50	0.12	Hi	0.11

56.700 = Total Area Avg. = 90 0% 0.500

PERCENT OF SUBBASIN DRY = 0.0 %
NORMAL = 0.0 %
WET = 100. %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.00

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.21

IMPERVIOUS AREA: URBAN @ 100 % effective = 0
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 0

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
271A1	0.089	0.630	0.106	11.0	0.50	0.00	6.80	0.21	0

INPUT VALUES FOR MCUHP2 PROGRAM

SUBBASIN	Area sq. mi.	Length mi.	Lca ft/mi	Kn in.	Slope	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %	Lag min.
271A1	0.089	0.62	0.31	0.12	11.3	0.50	0.00	6.80	0.21	0	58

LOSS PARAMETERS FOR SUBBASIN: SCE

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT Outcrop	% Rock
LB	62.700	100.	0.40	0

TOTAL = 62.700 Acres XKSAT = 0.40 %Rock = 0

DTHETA

Dry = 0.35 PSIF = 3.95
Normal = 0.25
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area	DTHETA condition	%Veg. cover	RTIMP% in.	IA Type	Kn	Kb	Kb
	Desert		DRY	20	0	0.35	0.05	Low	
59.000	RES	94.1	NORMAL	50	20	0.12	0.03	Low	0.06
	Comm		DRY	10	90	0.06	0.03	Min	
3.700	Golf	5.9	NORMAL	50	0	0.50	0.03	Min	0.04
	RowCrop		WET	90	0	0.50	0.12	Hi	
62.700 = Total Area			Avg. =	50	19%	0.140			

PERCENT OF SUBBASIN DRY = 0.0 %
NORMAL = 100. %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.25

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.58

IMPERVIOUS AREA: URBAN @ 100 % effective = 19
ROCK OUTCROP @ 100 % effective = 0

% EFFECTIVE IMP. = 19

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope	IA in.	DTHETA adj.	PSIF	XKSAT	RTIMP %
SCE	0.098	0.500	0.054	10.0	0.14	0.25	3.95	0.58	19

LOSS PARAMETERS FOR SUBBASIN: SCW

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	34.700	90.8	0.05	0
LB	3.500	9.2	0.40	0

TOTAL = 38.200 Acres XKSAT = 0.06 %Rock = 0

DTHETA

Dry = 0.29 PSIF = 8.40
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg. in.	RTIMP%	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
36.000	RES	94.2 NORMAL	50	20	0.12	0.03 Low	0.06		
	Comm	DRY	10	90	0.06	0.03 Min			
2.200	Golf	5.8 NORMAL	50	0	0.50	0.03 Min	0.04		
	RowCrop	WET	90	0	0.50	0.12 Hi			

38.200 = Total Area Avg. = 50 19% 0.140

PERCENT OF SUBBASIN DRY = 0.0 %
NORMAL = 100. %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.15

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.09

IMPERVIOUS AREA: URBAN @ 100 % effective = 19
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 19

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope	IA in.	DTHETA adj.	PSIF	XKSAT	RTIMP %
SCW	0.060	0.360	0.057	11.0	0.14	0.15	8.40	0.09	19

LOSS PARAMETERS FOR SUBBASIN: 12a1

Soil Survey Used Central County

XKSAT

Map Unit	AREA Acres	% Area	XKSAT	% Rock Outcrop
MR	14.000	100.	0.05	0

TOTAL = 14.000 Acres XKSAT = 0.05 %Rock = 0

DTHETA

Dry = 0.27 PSIF = 8.80
Normal = 0.15
Wet = 0.00

LAND USE

AREA Acres	LAND USE Type	% Area condition	DTHETA cover	%Veg.	RTIMP% in.	IA Type	Kn	Kb	Kb
	Desert	DRY	20	0	0.35	0.05 Low			
	RES	NORMAL	50	20	0.12	0.03 Low			
14.000	Comm	100. DRY	10	90	0.06	0.03 Min	0.03		
	Golf	NORMAL	50	0	0.50	0.03 Min			
	RowCrop	WET	90	0	0.50	0.12 Hi			

14.000 = Total Area Avg. = 10 90% 0.060

PERCENT OF SUBBASIN DRY = 100. %
NORMAL = 0.0 %
WET = 0.0 %

SUBBASIN DTHETA WEIGHTED BY LAND USE = 0.27

SUBBASIN XKSAT ADJUSTED FOR VEG. = 0.05

IMPERVIOUS AREA: URBAN @ 100 % effective = 90
ROCK OUTCROP @ 100 % effective = 0
% EFFECTIVE IMP. = 90

INPUT VALUES FOR MCUHP1 PROGRAM

SUBBASIN	Area sq.mi.	Length mi.	Kb ft/mi	Slope in.	IA	DTHETA adj.	PSIF	XKSAT	RTIMP %
12a1	0.022	0.200	0.033	10.0	0.06	0.27	8.80	0.05	90

24-Hour
Developed Conditions HEC-1 Model

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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   10JUN02  TIME  13:53:16   *
(916) 756-1104             *
 *                                       *
*
 *****************************************
*****************************************
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24hr. Dev.

```
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

             1          ID        DYSART RANCH HEC-1 MODEL
             2          ID        BY EEC MAY 2002   mjr
             3          ID        PORTIONS OF THIS MODEL WERE FROM
             4          ID        THE WLB GROUPD MODEL FOR SAGE CREEK MAY 1999 AND
             5          ID        THE FCDMC ORIGINAL MODEL FOR THE RID CANAL OVER-CHUTE DESIGN MAY
1997
             6          ID
             7          ID        100 YEAR, 24 HOUR STORM
             8          ID
             9          ID        FILE: DYR.24I
            10          ID
            11          ID
            12          ID
                       *DIAGRAM
            13          IT       5 01JAN94    0001     300
            14          IO        1
            15          IN       15
```

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          16          JD    4.03     0.01
          17          PC    .000     .002     .005     .008     .011     .014     .017     .020     .023
.026
          18          PC    .029     .032     .035     .038     .041     .044     .048     .052     .056
.060
          19          PC    .064     .068     .072     .076     .080     .085     .090     .095     .100
.105
          20          PC    .110     .115     .120     .126     .133     .140     .147     .155     .163
.172
          21          PC    .181     .191     .203     .218     .236     .257     .283     .387     .663
.707
          22          PC    .735     .758     .776     .791     .804     .815     .825     .834     .842
.849
          23          PC    .856     .863     .869     .875     .881     .887     .893     .898     .903
.908
          24          PC    .913     .918     .922     .926     .930     .934     .938     .942     .946
.950
          25          PC    .953     .956     .959     .962     .965     .968     .971     .974     .977
.980
          26          PC    .983     .986     .989     .992     .995     .998    1.00     1.000    1.000
1.000
          27          JD    3.99       10

          28          KK    2711
          29          KM    NEW SUBBASIN, PART OF THE PREVIOUS 271 NORTH OF INDIAN SCHOOL BYPASS
          30          BA    0.11
          31          LG     0.2     0.25      4.3     0.39       20
          32          UI      93      288      306      118       33       11        0        0        0
0
          33          UI       0        0        0        0        0        0        0        0        0
0

          34          KK    254A
          35          KM       RUNOFF HYDROGRAPH FROM SUB-BASIN 254A
          36          BA     .20
          37          LG     .12      .19     5.82      .21    20.00
          38          UI     72.     225.     404.     415.     246.     104.      51.      14.      13.
0.
          39          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.
0.
          40          UI      0.       0.       0.       0.       0.       0.       0.       0.       0.
0.

          41          KK  R2711
          42          KM       ROUTE FLOW FROM CP254A TO CP270A
          43          KM       FROM CP254A TO THE PROPOSED INDIAN SCHOOL BYPASS
          44          RS       2                -1
          45          RC   0.05     0.05     0.05     2100  0.0025
          46          RX   1000     1001     1002     1180     1310     1398     1399     1400
          47          RY   1050     1017     1017     1016     1016     1017     1017     1050
1                                                   HEC-1 INPUT
PAGE  2

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

          48          KK  CP2711
          49          HC       2.

          50          KK   1R12C
          51          KM
          52          KM       ROUTE FLOW FROM CP2711 TO MERGING POINT
          53          RS       1    FLOW       -1
          54          RC   0.015    0.015    0.015     1025  0.0015
          55          RX       0        5       15       20       26       31       41       46
          56          RY      10       10       10        5        5       10       10       10
                      * ****************************************************************

          57          KK     257
          58          KM   BASIN 257
```

```
          59          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          60          KM    L=      1.2  Lca=       .6   S=   11.6  Kn= .050  LAG=  40.3
          61          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
          62          BA     .34
          63          LG     .25     .15    8.80    0.25   30.00
          64          UI     28.     38.    105.    141.    168.    203.    258.    356.    298.
242.
          65          UI    201.    164.    132.     91.     50.     47.     31.     28.      9.
9.
          66          UI      9.      9.      9.      9.      0.      0.      0.      0.      0.
0.
          67          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          68          KK    257D
          69          KM        DIVERT OUT ONSITE RETENTION
          70          DT   257DO   36.54
          71          DI       0    1000
          72          DQ       0    1000

          73          KK    D257
          74          KM        DIVERT FROM CP257 TO CP256
          75          DT   DI256
          76          DI       0      56    1308
          77          DQ       0       0     922

          78          KK    R257
          79          KM        ROUTE FLOW FROM 271B1 TO CPA1
          80          KM                        257
          81          KM                                3350
          82          RS       3    FLOW      -1
          83          RC   0.035   0.025   0.035    2600   0.002
          84          RX       0       5       8      18      26     215     220     230
          85          RY    1021    1020    1018    1018    1020    1020    1020    1021

          86          KK    D257
          87          KM        RETURN DIVERT AT CP257
          88          DR   DI256
1                                                HEC-1 INPUT
PAGE  3

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

          89          KK   RD257
          90          KM        ROUTE DIVERT FROM CP257 TO CP256
          91          KM    *********   RENAMED FROM R257 TO RD257  *****    BY WLB MAY 1999
          92          RS      12              -1       0
          93          RC    .035    .035    .075    2680   .0018
          94          RX    1000    1001    1002    1010    1540    1858    1859    1860
          95          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

          96          KK     256
          97          KM   BASIN 256
          98          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          99          KM    L=      1.2  Lca=       .6   S=   11.6  Kn= .070  LAG=  56.4
         100          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
         101          BA     .43
         102          LG     .35     .15    8.80    0.22   18.00
         103          UI     26.     26.     49.     93.    120.    138.    155.    178.    204.
264.
         104          UI    324.    290.    242.    213.    187.    161.    139.    121.     91.
62.
         105          UI     45.     42.     36.     26.     26.     12.      8.      8.      8.
8.
         106          UI      8.      8.      8.      0.      0.      0.      0.      0.      0.
0.
         107          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
```

```
          108          KK    256D
          109          KM         DIVERT OUT ONSITE RETENTION
          110          DT   256DO    37.6
          111          DI       0    1000
          112          DQ       0    1000

          113          KK   CP256
          114          KM         COMBINE 256 AND RD257
          115          HC       2

          116          KK  DE256B
          117          KM         DIVERT AT INTERSECTION OF INDIAN SC. AND DYSART RD
          118          KM         WEIR SECTION THROUGH CENTER OF INTERSECTION
          119          DT  DW256B
          120          DI       0       7      90     276     655
          121          DQ       0       0      25     116     495

          122          KK    R256
          123          KM     ROUTE REMAINING FLOW ALONG THE EAST SIDE OF DYSART RD
          124          RS       3    FLOW      -1       0
          125          RC    .035   0.025   0.035    1300   0.003
          126          RX    1000    1001    1002    1010    1110    1120    1859    1860
          127          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

          128          KK   271B2
          129          KM   BASIN 271B2
          130          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          131          KM    L=        .4  Lca=        .2   S=   10.8  Kn= .120  LAG=  40.1
          132          KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
          133          BA     .04
          134          LG     .50     .00    3.95     .76     .00
          135          UI      6.     21.     26.     19.      9.      4.      2.      1.      0.
0.
          136          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
1                                                HEC-1 INPUT
PAGE  4

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

          137          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          138          KK     RB2
          139          KM        ROUTE FLOW FROM 271B1 TO CPA1
          140          KM
          141          KM
          142          RS     2.5    FLOW      -1
          143          RC   0.035   0.025   0.035    2600   0.002
          144          RX       0       5       8      18      26     215     220     230
          145          RY    1021    1020    1018    1018    1020    1020    1020    1021

          146          KK   271B1
          147          KM   BASIN 271B1
          148          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          149          KM    L=        .2  Lca=        .1   S=   11.1  Kn= .120  LAG=  22.8
          150          KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
          151          BA     .01
          152          LG     .50     .00    3.95     .76     .00
          153          UI      8.     17.      8.      2.      1.      0.      0.      0.      0.
0.
          154          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          155          KK     RB1
          156          KM        ROUTE FLOW FROM 271B1 TO CPA1
          157          KM
          158          KM
          159          RS       2    FLOW      -1
          160          RC   0.035   0.025   0.035    2000   0.002
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         161                RX        0         5         8        18        26       215       220       230
         162                RY     1021      1020      1018      1018      1020      1020      1020      1021

         163                KK    271A1
         164                KM    BASIN 271A1
         165                KM      THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         166                KM      L=         .5  Lca=         .3    S=    11.5  Kn= .120  LAG=   50.8
         167                KM      AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
         168                BA      .07
         169                LG      .50       .00      7.00       .19       .00
         170                UI       7.       26.       41.       39.       29.       17.        9.        5.        3.
2.
         171                UI       1.        1.        1.        1.        1.        0.        0.        0.        0.
0.
         172                UI       0.        0.        0.        0.        0.        0.        0.        0.        0.
0.

         173                KK      CPA1
         174                KM          COMBINE FLOWS AT NE CORNER OF SAGE CREEK
         175                HC        5

         176                KK    ~~R256A~~ [CPA1]
         177                KM        ROUTE REMAINING FLOW ALONG THE EAST SIDE OF DYSART RD  [TO CPSCW]
         178                KM      *********                                   **      BY WLB MAY 1999
         179                RS        2      FLOW        -1         0
         180                RC     .035     0.025     0.035      1600 [1800]  0.003
         181                RX     1000      1001      1002      1010      1110      1120      1859      1860
         182                RY   1025.5      1025      1025      1024      1024      1025      1025    1025.5
1                                                          HEC-1 INPUT
PAGE  5

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

         183                KK      SCE
         184                KM    BASIN SCE
         185                KM      THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         186                KM      L=         .5  Lca=         .2    S=    18.4  Kn= .035  LAG=   12.3
         187                KM      PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
         188                BA      .10
         189                LG      0.12      .25      3.95       .60     42.00
         190                UI      60.      175.      284.      158.       55.       18.        8.        0.        0.
0.
         191                UI       0.        0.        0.        0.        0.        0.        0.        0.        0.
0.

         192                KK      SCW
         193                KM    BASIN SCW
         194                KM      THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         195                KM      L=         .4  Lca=         .1    S=    20.6  Kn= .035  LAG=    7.4
         196                KM      PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
         197                BA      .06
         198                LG      .26       .25      4.35       .49     42.00
         199                UI     100.      256.       91.       14.        0.        0.        0.        0.        0.
0.
         200                UI       0.        0.        0.        0.        0.        0.        0.        0.        0.
0.

         201                KK     CPW
         202                KM          COMBINE ~~AND ROUTE ONSITE RUNOFF THROUGH STORAGE BASINS~~
         203                HC        2

         204                KK    RSCW_E
         205                KM         RETENTION BASINS WITH SAGE CREEK DEVEL.
         206                KM          OUTFLOW IS ASSUMED TO BE THROUGH LOW FLOW PIPES
         207                KM          DRYWELLS MY ALSO BE USED
         208                RS        1      STOR         0
         209                SV        0         3         8      13.9      14.6
         210                SE     1015      1016      1017      1018    1018.5
         211                SQ        0         5         5         5       100

[CPSCW]
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             212          KK   CPSCW
             213          KM        COMBINE AND ROUTE ONSITE RUNOFF THROUGH STORAGE BASINS
             214          HC       2

             215          KK    SUB6
             216          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
             217          KM    L=      1.1  Lca=       .6   S=   19.0  Kn= .030  LAG=  20.0
             218          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
             219          BA     .10
             220          LG     .17     .20    6.00     .16   20.00
             221          UI     21.     75.    114.    189.    162.    109.     65.     30.     17.
5.
             222          UI      5.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             223          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

             224          KK    SUB7
             225          KM   BASIN SUB7
             226          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
             227          KM    L=      1.0  Lca=       .5   S=   21.0  Kn= .030  LAG=  19.0
             228          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
             229          BA     .24
             230          LG     .19     .19    6.80     .20    3.00
1                                                  HEC-1 INPUT
PAGE  6

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

             231          UI     55.    192.    294.    483.    362.    238.    117.     60.     28.
13.
             232          UI     13.      0.      0.      0.      0.      0.      0.      0.      0.
0.
             233          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

             234          KK      D7
             235          KM   DIVERT D7 TO CP255A
             236          DT   D7OUT
             237          DI       0     250
             238          DQ       0     125

             239          KK   DR256
             240          KM        ADD OVERFLOW FROM CP256 TO BE ROUTED WITH RSUB6 TO CP271A
             241          DR  DW256B

             242          KK  CPSUB6
             243          KM    *** OPPERATION RENAMED BY THE WLB GROUP MAY 1999
             244          KM      ADD HYDROGRAPHS AT CPSUB6
             245          HC       3

             246          KK    R12A
             247          KM        ROUTE CPSUB 6 TO CP12A
             248          KM
             249          RS       3    FLOW      -1       0
             250          RC    .035   0.028   0.035    2500  0.0007
             251          RX    2000    2000    2010    2035    2075    2095    2100    2100
             252          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016

             253          KK   2712a
             254          KM   BASIN 2712a
             255          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
             256          KM    L=       .6  Lca=       .3   S=   10.7  Kn= .037  LAG=  16.3
             257          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
             258          BA     .07
             259          LG     .18     .15    8.00     .10   52.00
             260          UI     23.     75.    128.    152.     92.     45.     20.      7.      4.
0.
```

```
          261          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
          262          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          263          KK  CP12A
          264          KM
          265          HC       2

          266          KK  4R12C
          267          KM       ROUTE CP12A TO 1I12C
          268          KM
          269          RS       1    FLOW      -1       0
          270          RC    .035   0.025   0.035     400  0.0007
          271          RX    2000    2000    2010    2035    2075    2095    2100    2100
          272          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016
1                                                HEC-1 INPUT
PAGE  7

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

          273          KK  1I12C
          274          KM       ADD HYDROGRAPHS AT 1I12C
          275          HC       2

          276          KK   2R12C
          277          KM        ROUTE 1I12C TO CP12C
          278          KM
          279          RS       2    FLOW      -1       0
          280          RC    .035    .028   0.035    2850  0.005
          281          RX    2000    2005    2010    2025    2055    2070    2075    2080
          282          RY    1012    1011  1010.5  1005.5  1005.5  1010.5    1011    1012

          283          KK    255A
          284          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 255A
          285          BA   .5968
          286          LG    .20     .22    3.88     .29   12.00
          287          UI    91.    359.    542.    814.   1029.    707.    492.    268.    147.
86.
          288          UI    28.     28.     28.      0.      0.      0.      0.      0.      0.
0.
          289          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          290          KK   D7OUT
          291          KM        RETURN DIVERT TO 255A
          292          DR   D7OUT

          293          KK   R255A
          294          KM        ROUTE DIVERT FORM SUB 7 TO CP255A
          295          KM
          296          RS       1    FLOW      -1       0
          297          RC    .035   0.025   0.035    1000  0.002
          298          RX    2000    2000    2010    2015    2045    2050    2060    2060
          299          RY    1018    1017    1012    1015    1015    1012    1017    1018

          300          KK  CP255A
          301          KM        ADD HYDROGRAPHS AT CP255A
          302          HC       2

          303          KK    R12B
          304          KM        ROUTE CP255A TO CP12C
          305          KM
          306          RS       2    FLOW      -1       0
          307          RC    .035    .028   0.035    1400   .0011
          308          RX    2000    2000    2010    2035    2080    2112    2122    2122
          309          RY  1018.5    1018  1017.9  1010.9  1011.6  1017.9    1018  1018.5

          310          KK   2712b
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                311          KM   BASIN 2712b
                312          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                313          KM    L=       .5  Lca=       .2   S=   11.1  Kn= .047  LAG=  18.7
                314          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
                315          BA     .08
                316          LG     .24      .15     8.00      .10   34.00
                317          UI    19.      66.     101.      165.   119.      78.      36.      19.      8.
4.
                318          UI     4.       0.       0.       0.     0.       0.       0.       0.       0.
0.
                319          UI     0.       0.       0.       0.     0.       0.       0.       0.       0.
0.
1                                                      HEC-1 INPUT
PAGE  8

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


                320          KK   CP12B
                321          KM   PEAK FLOW PLAZE DRIVE CULEVRTS
                322          HC       2
Route to 12C
                323          KK   2712C
                324          KM   BASIN 2712c
                325          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
                326          KM    L=       .5  Lca=       .0   S=    7.5  Kn= .029  LAG=   6.6
                327          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
                328          BA     .15
                329          LG     .15      .28     5.60      .23   47.00
                330          UI    315.     681.     158.       0.     0.       0.       0.       0.       0.
0.
                331          UI     0.       0.       0.       0.     0.       0.       0.       0.       0.
0.

                332          KK   2I12C
                333          KM   COMBINE THREE FLOWS
                334          HC       3

                335          KK   SR12C
                336          KM        STORAGE ROUTE CP12C BEHIND ROOSEVELT CANAL
                337          KM
                338          RS       1    STOR       0
                339          SV     2.5      7.7     13.2     16.5     19.8     28.2     38.9     51.1     64.9
80.5
                340          SE    1004     1005     1006   1006.5     1007     1008     1009     1010     1011
1012
                341          SQ       0        0        0      0.0       25      150      360      650      900
1200

                342          KK   3R12C
                343          KM        ROUTE SR12C TO 3I12C (MERGE POINT)
                344          KM
                345          RS       3    FLOW       -1        0
                346          RC    .035   0.025    0.035      900     .001
                347          RX    9968     9968     9970     9990    10010    10030    10032    10032
                348          RY    1013   1012.5   1012.5   1006.7   1006.7   1012.5   1012.5    1013

                349          KK  MERGE
                350          KM        COMBINED Q'S ALONG INDIAN SCH.RD. INTO OVERCHUTE
                351          HC       2

                352          KK  R271_1
                353          KM    ROUTE THE MERGING POINT OF TWO CHANNELS TO LITCH, 3/8/96, FCD
                354          RD
                355          RC   0.015   0.015    0.015      625   0.0015
                356          RX      10       11       12       12       42       42       43       44
                357          RY      10       10       10      5.0      5.0       10       10       10

                358          KK     270
                359          KM   BASIN 270
```

1400 MINIMUM

Three feet deeper

repeat based 55.2 @ 1012

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          360          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN** REVISED BY
FCD
          361          KM    L=       .7  Lca=       .3   S=   10.5  Kn= .030  LAG=  16.0
          362          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
          363          BA   .2936
          364          LG     .16     .22    3.58     .38   18.00
          365          UI    100.    319.    558.    621.    371.    170.     78.     26.     19.
0.
          366          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.
1                                                  HEC-1 INPUT
PAGE  9

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

          367          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          368          KK   2712d
          369          KM   BASIN 2712d
          370          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          371          KM    L=       .3  Lca=       .1   S=   11.1  Kn= .020  LAG=   5.1
          372          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
          373          BA     .02
          374          LG     .10     .25    4.70     .45   80.00
          375          UI     82.     81.      8.      0.      0.      0.      0.      0.      0.
0.
          376          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.
0.

          377          KK   LITCH
          378          KM   OVER-CHUTE FLOW
          379          KM      PEAK DISCHARGE IN THE NEW RID CANAL CHANNEL
          380          HC      3
          381          ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    28        2711
              .
              .
    34        .        254A
              .          V
              .          V
    41        .      R2711
              .          .
              .          .
    48      CP2711.........
            V
            V
    50     1R12C
              .
              .
    57        .         257
              .          .
              .          .
    70        .          .-------->   257DO
    68        .        257D
              .          .
              .          .
    75        .          .-------->   DI256
    73        .        D257
              .          V
              .          V
    78        .        R257
              .          .
```
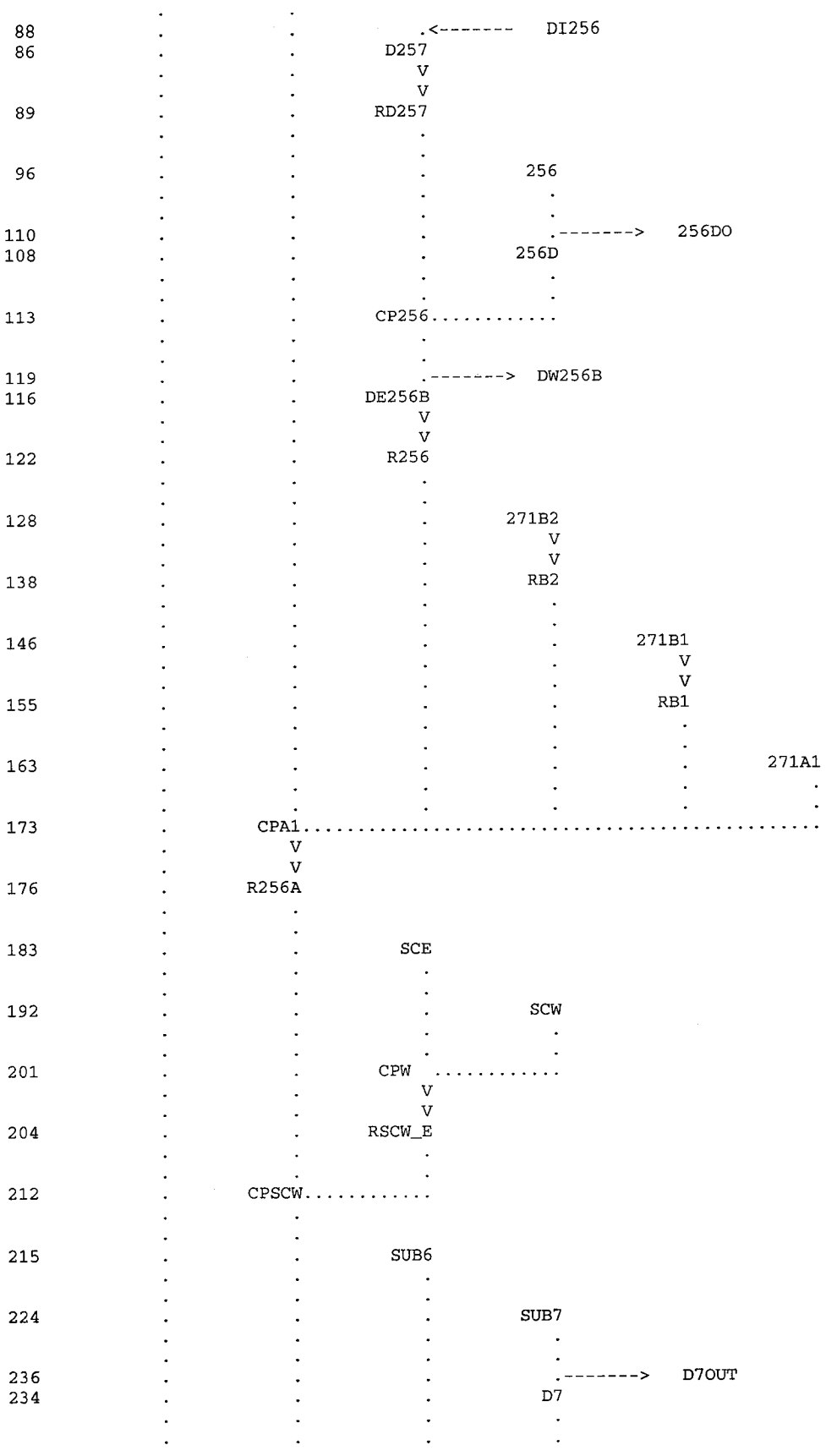
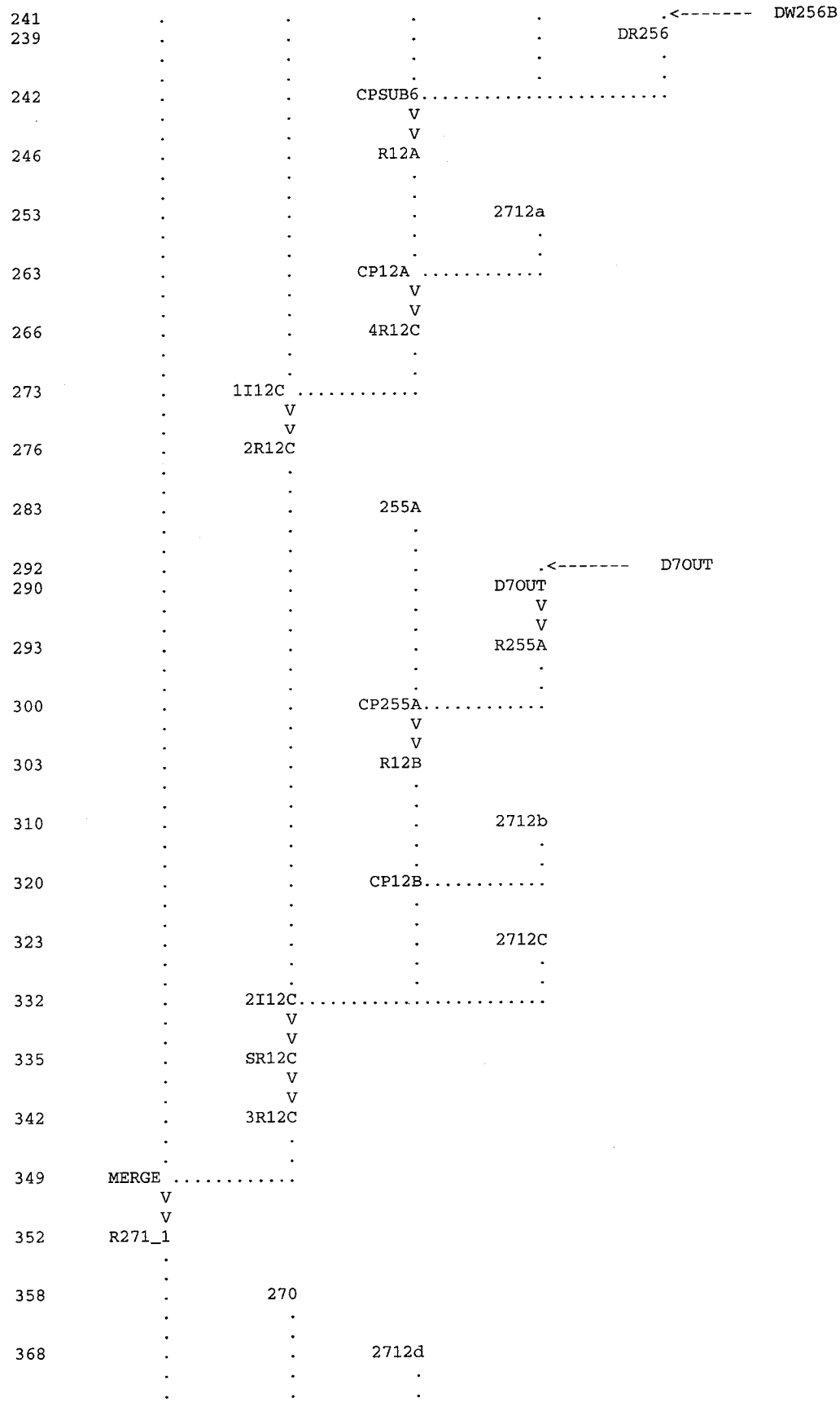


88
86
89
96
110
108
113
119
116
122
128
138
146
155
163
173
176
183
192
201
204
212
215
224
236
234
DI256
D257
RD257
256
256DO
256D
CP256
DW256B
DE256B
R256
271B2
RB2
271B1
RB1
271A1
CPA1
R256A
SCE
SCW
CPW
RSCW_E
CPSCW
SUB6
SUB7
D7OUT
D7


241
239
242
246
253
263
266
273
276
283
292
290
293
300
303
310
320
323
332
335
342
349
352
358
368
DW256B
DR256
CPSUB6
R12A
2712a
CP12A
4R12C
1I12C
2R12C
255A
D7OUT
D7OUT
R255A
CP255A
R12B
2712b
CP12B
2712C
2I12C
SR12C
3R12C
MERGE
R271_1
270
2712d

377 LITCH.....

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

*

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1164.	12.17		318.	91.	87.	87.
		(INCHES)	1.015	1.158	1.159	1.159
		(AC-FT)	158.	180.	180.	180.

CUMULATIVE AREA = 2.91 SQ MI

1

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

MAXIMUM STAGE +	TIME OF MAX STAGE	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA
+	HYDROGRAPH AT	2711	234.	12.00	18.	5.	5.	.11
+	HYDROGRAPH AT	254A	404.	12.08	36.	10.	10.	.20
+	ROUTED TO	R2711	281.	12.33	36.	10.	10.	.20
+	2 COMBINED AT	CP2711	385.	12.08	54.	15.	15.	.31
+	ROUTED TO	1R12C	375.	12.17	54.	15.	15.	.31
+	HYDROGRAPH AT	257	391.	12.50	64.	19.	19.	.34
+	DIVERSION TO	257DO	391.	12.50	64.	18.	18.	.34
+	HYDROGRAPH AT	257D	4.	19.67	3.	1.	1.	.34
+	DIVERSION TO	DI256	0.	.00	0.	0.	0.	.34
+	HYDROGRAPH AT	D257	4.	19.67	3.	1.	1.	.34
+	ROUTED TO	R257	4.	20.58	3.	1.	1.	.34
+	HYDROGRAPH AT	D257	0.	.00	0.	0.	0.	.34
+	ROUTED TO	RD257	0.	.00	0.	0.	0.	.34
+	HYDROGRAPH AT	256	379.	12.75	73.	21.	20.	.43

+	DIVERSION TO	256DO	379.	12.75	72.	19.	18.	.43
+	HYDROGRAPH AT	256D	15.	14.58	5.	2.	2.	.43
+	2 COMBINED AT	CP256	15.	14.58	5.	2.	2.	.43
+	DIVERSION TO	DW256B	3.	14.58	0.	0.	0.	.43
+	HYDROGRAPH AT	DE256B	13.	14.58	5.	2.	2.	.43
+	ROUTED TO	R256	8.	15.17	5.	2.	2.	.43
+	HYDROGRAPH AT	271B2	21.	12.08	1.	0.	0.	.04
+	ROUTED TO	RB2	13.	12.33	1.	0.	0.	.04
+	HYDROGRAPH AT	271B1	10.	12.00	1.	0.	0.	.01
+	ROUTED TO	RB1	5.	12.25	1.	0.	0.	.01
+	HYDROGRAPH AT	271A1	45.	12.08	5.	1.	1.	.07
+	5 COMBINED AT	CPA1	58.	12.17	9.	4.	4.	.89
+	ROUTED TO	R256A	47.	12.33	9.	4.	4.	.89
+	HYDROGRAPH AT	SCE	206.	12.08	19.	6.	6.	.10
+	HYDROGRAPH AT	SCW	147.	12.00	12.	4.	4.	.06
+	2 COMBINED AT	CPW	333.	12.00	30.	10.	9.	.16
+	ROUTED TO	RSCW_E	9.	13.58	6.	4.	3.	.16
+	2 COMBINED AT	CPSCW	52.	12.33	15.	7.	7.	1.05
+	HYDROGRAPH AT	SUB6	189.	12.17	20.	6.	5.	.10
+	HYDROGRAPH AT	SUB7	429.	12.17	37.	9.	9.	.24
+	DIVERSION TO	D7OUT	215.	12.17	18.	5.	5.	.24
+	HYDROGRAPH AT	D7	215.	12.17	18.	5.	5.	.24
+	HYDROGRAPH AT	DR256	3.	14.58	0.	0.	0.	.43
+	3 COMBINED AT	CPSUB6	403.	12.17	38.	10.	10.	.34

+	ROUTED TO	R12A	335.	12.42	38.	10.	10.	.34
+	HYDROGRAPH AT	2712a	150.	12.08	18.	6.	5.	.07
+	2 COMBINED AT	CP12A	408.	12.33	55.	16.	15.	.41
+	ROUTED TO	4R12C	405.	12.33	55.	16.	15.	.41
+	2 COMBINED AT	1I12C	456.	12.33	69.	23.	22.	1.46
+	ROUTED TO	2R12C	435.	12.42	69.	23.	22.	1.46
+	HYDROGRAPH AT	255A	959.	12.25	96.	26.	25.	.60
+	HYDROGRAPH AT	D7OUT	215.	12.17	18.	5.	5.	.24
+	ROUTED TO	R255A	203.	12.25	18.	5.	5.	.24
+	2 COMBINED AT	CP255A	1161.	12.25	115.	31.	30.	.60
+	ROUTED TO	R12B	1119.	12.25	115.	31.	30.	.60
+	HYDROGRAPH AT	2712b	159.	12.17	18.	5.	5.	.08
+	2 COMBINED AT	CP12B	1265.	12.25	133.	36.	35.	.68
+	HYDROGRAPH AT	2712C	399.	12.00	32.	10.	10.	.15
+	3 COMBINED AT	~~2I12C~~ CP12C	1637.	12.33	231.	69.	67.	2.29
+	ROUTED TO	SR12C	878.	12.58	216.	60.	58.	2.29
+	ROUTED TO	3R12C	878.	12.67	216.	60.	58.	2.29
+	2 COMBINED AT	MERGE	1086.	12.58	267.	75.	72.	2.60
+	ROUTED TO	R271_1	1084.	12.58	267.	75.	72.	2.60
+	HYDROGRAPH AT	270	549.	12.08	48.	14.	13.	.29
+	HYDROGRAPH AT	2712d	61.	12.00	6.	2.	2.	.02
+	3 COMBINED AT	LITCH	1164.	12.17	318.	91.	87.	2.91

1

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

	ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	PEAK	TIME TO PEAK
			(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)
VOLUME (IN)									
FOR STORM = 1 STORM AREA (SQ MI) = .01									
	R271_1	MANE	1.02	1096.77	754.39	1.09	5.00	1096.05	755.00
1.09									

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1517E+03 EXCESS= .0000E+00 OUTFLOW= .1516E+03 BASIN STORAGE= .1357E+00 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = 10.00									
	R271_1	MANE	1.02	1081.93	754.90	1.07	5.00	1081.56	755.00
1.07									

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1485E+03 EXCESS= .0000E+00 OUTFLOW= .1484E+03 BASIN STORAGE= .1341E+00 PERCENT ERROR= .0

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

6-Hour
Developed Conditions HEC-1 Model

```
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   12JUN02  TIME  07:03:04  *                                      *           (916) 756-
1104            *
 *                                      *                                      *
*
 ****************************************
****************************************
```

6 hr. Dev.

```
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

   1          ID        DYSART RANCH
   2          ID        100-YEAR, 6HOUR STORM
   3          ID        HEC-1 MODEL
   4          ID        BY EEC MAY 2002      mjr
   5          ID
   6          ID        FILE: DYR.6I
   7          ID
   8          IT      5             700
              *DIAGRAM

   9          KK    SUB6
  10          KM
  11          PB   3.10
  12          PC  0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.075
  13          PC  0.087   0.099   0.119   0.148   0.230   0.407   0.778   0.881   0.919   0.945
  14          PC  0.957   0.968   0.980   0.990    1.00
  15          BA    0.1
  16          LG  0.170   0.200    6.00   0.160    20.0
  17          UC  0.979   0.815            0.00
  18          UA      0       3       5       8      12      20      43      75      90      96
  19          UA    100

  20          KK    SUB7
  21          KM
  22          BA   0.24
  23          LG   0.19   0.190    6.80   0.200    3.00
  24          UC  0.979   0.815            0.00
  25          UA      0       3       5       8      12      20      43      75      90      96
  26          UA    100

  27          KK      D7
  28          KM        DIVERT FROM D7 TO CP255A        50/50 SPLIT
  29          DT   D7OUT
  30          DI      0     250
  31          DQ      0     125

  32          KK  C6
  33          KM
```

```
 34          HC       2

 35          KK     D67
 36          KM  DIVERT ALL FLOW TO CP271A
 37          DT    DO67
 38          DI       0     522
 39          DQ       0     522

 40          KK     256
 41          KM   SUB-BASIN 256
 42          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
 43          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
 44          KM     L = 1.07  Kb = .036  Adj. Slope =   21.0
 45          BA    .184
 46          LG    .080    .280   7.000    .140  64.000
 47          UC    .533    .510
 48          UA       0       5      16      30      65      77      84      90      94      97
1                                        HEC-1 INPUT                                          PAGE
2

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

 49          UA     100

 50          KK  256RET
 51          KM        DIVERT ONSITE RETENTION OUT    100 2 hour
 52          DT   DO256    14.8
 53          DI       0    1000
 54          DQ       0    1000

 55          KK  DE256A
 56          KM        DIVERT THROUGH STORM DRAIN INLET
 57          KM        15CFS INTO DYSART ROAD CHANNEL
 58          DT  DW256A
 59          DI       0      15      20      50     250     600
 60          DQ       0      15      15      15      15      15

 61          KK  DE256B
 62          KM        DIVERT WEIR FLOW AT INTERSECTION OF IN SC. AND DYSART
 63          DT  DW256B
 64          DI       0       7      90     276     655
 65          DQ       0       0      25     116     164

 66          KK  DE256C
 67          KM   DIVERT OUT   stormdrain in dysart(south of intersection)
 68          DT  DW256C
 69          DI       0      15      20      50     250     600
 70          DQ       0      15      15      15      15      15

 71          KK    R256
 72          KM   ROUTE REMAINING FLOW TO CPA1
 73          RS       2      -1
 74          RC   0.035   0.025   0.015    1300   0.004
 75          RX    1000    1001    1026    1056    1068    1069    1100    1101
 76          RY    1020  1018.9  1018.7  1018.1  1018.7  1018.7  1019.3  1019.8

 77          KK    CPA1
 78          KM        COMBINE FLOWS AT NORTHEAST CORNER OF SAGE CREEK
 79          HC       2

 80          KK   RCPA1
 81          KM        ROUTE ALONG EAST SIDE OF DYSART ROAD
 82          RS       2    FLOW      -1
 83          RC   0.035   0.025   0.035    1600   0.003
 84          RX    1000    1001    1002    1010    1110    1200    1859    1860
 85          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

 86          KK  DW256A
 87          KM        RETURN STORM DRAIN DIVERT
 88          DR  DW256A

 89          KK  DW256B
 90          KM        RETURN WEIR FLOW
 91          DR  DW256B
1                                        HEC-1 INPUT                                          PAGE
3

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

 92          KK  DW256C
 93          KM        RETURN STORM DRAIN DIVERT
 94          DR  DW256C

 95          KK    DO67
 96          KM        RETURN CPSUB6 DIVERT
 97          DR    DO67
```

```
 98          KK  CPSUB6
 99          KM
100          HC       4

101          KK    R12A
102          KM         ROUTE CPSUB 6 TO CP12A
103          KM
104          RS       3    FLOW      -1       0
105          RC    .035   0.028   0.035    2500   0.002
106          RX    2000    2000    2010    2035    2075    2095    2100    2100
107          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016

108          KK     12A
109          KM   SUB-BASIN 2712a
110          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
111          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
112          KM     L =  .56  Kb = .045  Adj. Slope =   11.0
113          BA    .071
114          LG    .180    .150   8.000    .100  52.000
115          UC    .529    .518
116          UA       0       5      16      30      65      77      84      90      94      97
117          UA     100

118          KK   CP12A
119          KM        PEAK FLOW AT OSBORN CULVERTS
120          HC       2

121          KK   271A1
122          KM   SUB-BASIN 271A1
123          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
124          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
125          KM     L =  .63  Kb = .106  Adj. Slope =   11.0
126          BA    .089
127          LG    .500    .000   6.800    .210    .000
128          UC   1.050   1.072
129          UA       0       3       5       8      12      20      43      75      90      96
130          UA     100

131          KK   SCE
132          KM   SUB-BASIN SCE
133          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
134          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
135          KM     L =  .50  Kb = .054  Adj. Slope =   10.0
136          BA    .098
137          LG    .140    .250   3.950    .580  19.000
138          UC    .688    .527
```



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

139          UA       0       5      16      30      65      77      84      90      94      97
140          UA     100

141          KK   SCW
142          KM   SUB-BASIN SCW
143          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
144          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
145          KM     L =  .36  Kb = .057  Adj. Slope =   11.0
146          BA    .060
147          LG    .140    .150   8.400    .090  19.000
148          UC    .475    .355
149          UA       0       5      16      30      65      77      84      90      94      97
150          UA     100

151          KK   CPSC
152          KM    COMBINE FLOW AT SAGE CREEK
153          HC       2

154          KK  SCRET
155          KM        DIVERT ONSITE RETENTION OUT
156          DT   DOSC     14.6
157          DI       0    1000
158          DQ       0    1000

159          KK   1I12C
160          KM         COMBINE ALL FLOW AT DYSART ROAD AND RID CANAL WEST SIDE OF ROAD
161          HC       4

162          KK   255A
163          KM   SUB-BASIN 255A
164          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
165          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
166          KM     L = 1.60  Kb = .050  Adj. Slope =   15.0
167          BA    .597
168          LG     0.2    0.22    3.88    0.29    12.0
169          UC   1.079   0.787
170          UA       0       5      16      30      65      77      84      90      94      97
```

```
171          UA     100

172          KK   D7OUT
173          KM         RETURN SUB 7 DIVERT
174          DR   D7OUT

175          KK  CP255A
176          KM         COMBINE 255A AND SUB 7
177          HC       2

178          KK    R12B
179          KM         ROUTE CP255A TO CP12C
180          KM
181          RS       2    FLOW      -1       0
182          RC    .035    .028   0.035    1400    .002
183          RX    2000    2000    2010    2035    2080    2127    2122    2123
184          RY  1018.5    1018  1017.9  1010.9  1010.9  1017.9    1018  1018.5
```



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

185          KK     12C
186          KM   SUB-BASIN 2712b
187          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
188          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
189          KM     L =  .54  Kb = .054  Adj. Slope =   11.0
190          BA    .080
191          LG    .110    .160   8.000    .100  26.000
192          UC    .592    .533
193          UA       0       5      16      30      65      77      84      90      94      97
194          UA     100

195          KK   CP12B
196          KM         PEAK FLOW AT PLAZA DRIVE CULVERTS
197          HC       2

198          KK   12C
199          KM   SUB-BASIN 2712c
200          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
201          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
202          KM     L =  .57  Kb = .037  Adj. Slope =    7.0
203          BA    .152
204          LG    .150    .380   5.600    .200  61.000
205          UC    .575    .374
206          UA       0       3       5       8      12      20      43      75      90      96
207          UA     100

208          KK   CP12C
209          KM         PEAK INLFOW TO EXITING STORAGE BASIN
210          HC       2

211          KK   SR12C
212          KM         STORAGE ROUTE CP12C BEHIND ROOSEVELT CANAL
213          KM
214          RS       1    STOR       0
215          SV       0     5.9    12.1    18.5    25.6    34.3    44.9    57.1    70.9    86.6
216          SE    1003    1004    1005    1006    1007    1008    1009    1010    1011    1012
217          SQ       0       0       0       0      25     150     360     575     800    1080
218          ZZ
```

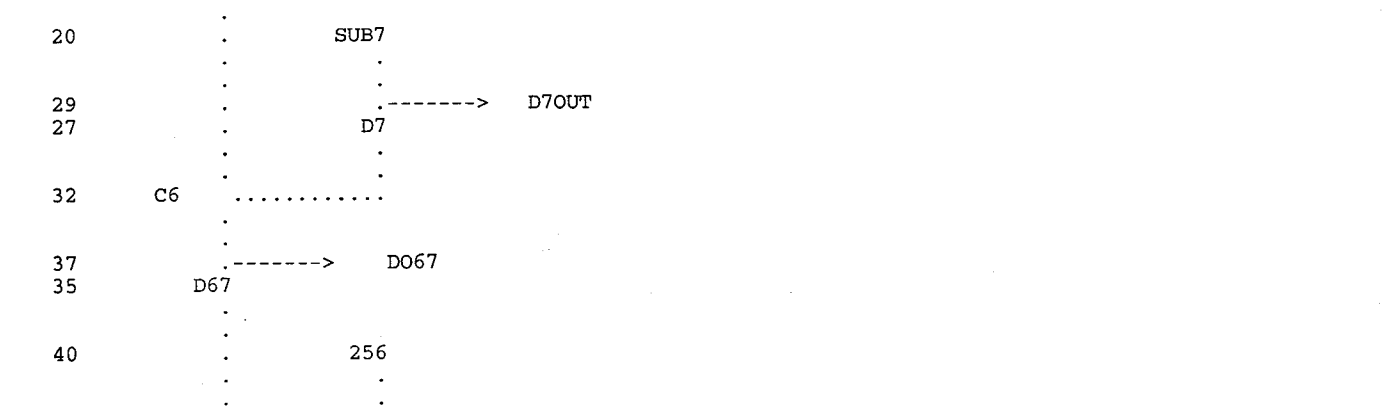
1

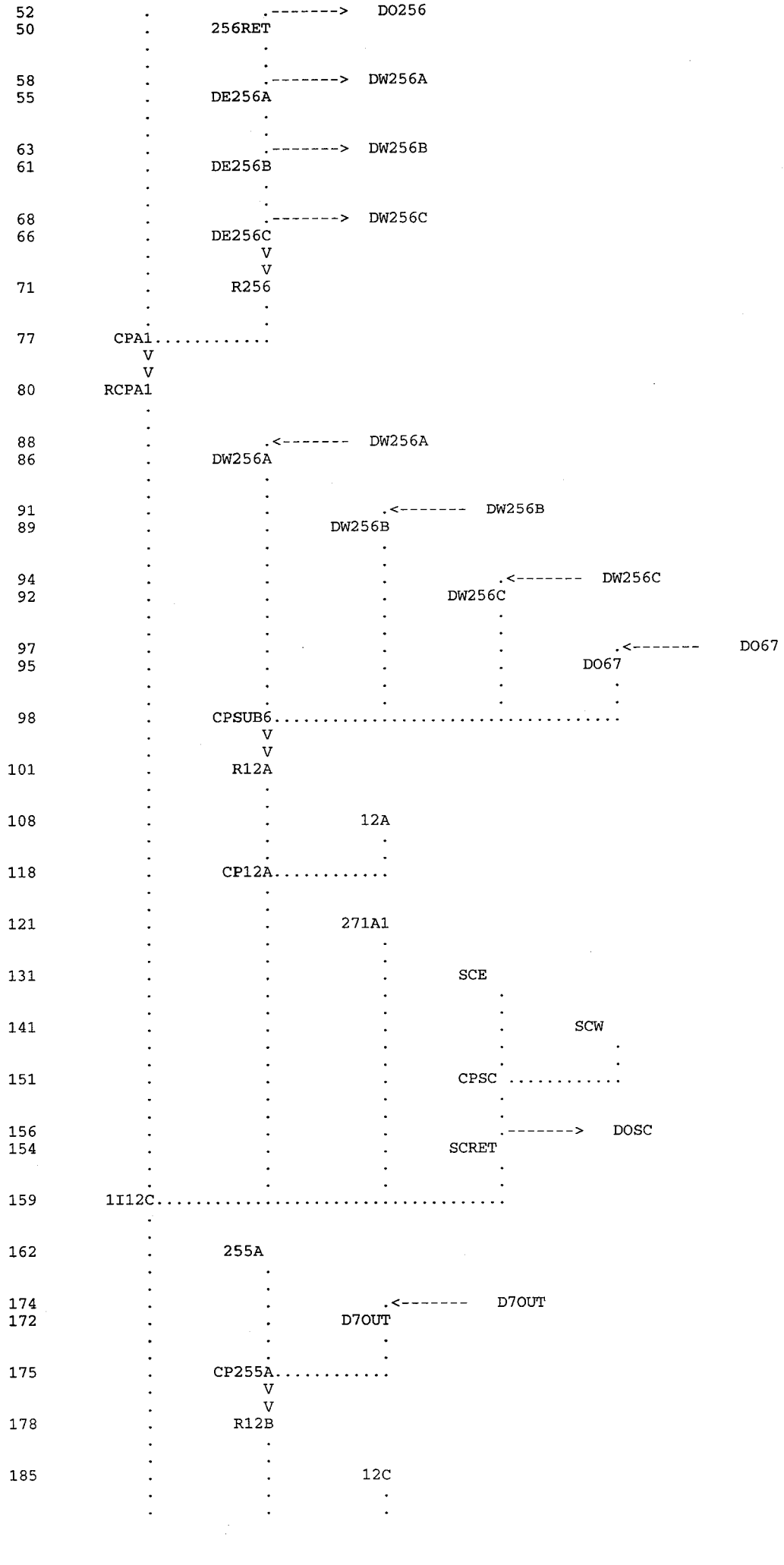
SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

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

(.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW




52
DO256
50
256RET
58
DW256A
55
DE256A
63
DW256B
61
DE256B
68
DW256C
66
DE256C
71
R256
77
CPA1
80
RCPA1
88
DW256A
86
DW256A
91
DW256B
89
DW256B
94
DW256C
92
DW256C
97
DO67
95
DO67
98
CPSUB6
101
R12A
108
12A
118
CP12A
121
271A1
131
SCE
141
SCW
151
CPSC
156
DOSC
154
SCRET
159
1I12C
162
255A
174
D7OUT
172
D7OUT
175
CP255A
178
R12B
185
12C

```
    195          .       CP12B.....
                 .         .
                 .         .
    198          .         .       12C
                 .         .         .
                 .         .         .
    208          .       CP12C.....
                 .         V
                 .         V
    211          .       SR12C
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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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   12JUN02  TIME  07:03:04  *                    *          (916) 756-1104
 *                                      *                    *
 *                                      *                    *
 ****************************************
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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
+	HYDROGRAPH AT	SUB6	118.	2.17	25.	18.	18.	.10	
+	HYDROGRAPH AT	SUB7	261.	2.08	54.	39.	39.	.24	
+	DIVERSION TO	D7OUT	130.	2.08	27.	20.	20.	.24	
+	HYDROGRAPH AT	D7	130.	2.08	27.	20.	20.	.24	
+	2 COMBINED AT	C6	248.	2.17	52.	38.	38.	.34	
+	DIVERSION TO	DO67	248.	.00	52.	38.	38.	.34	
+	HYDROGRAPH AT	D67	0.	.00	0.	0.	0.	.34	
+	HYDROGRAPH AT	256	341.	1.67	54.	39.	39.	.18	
+	DIVERSION TO	DO256	341.	2.00	30.	21.	21.	.18	
+	HYDROGRAPH AT	256RET	231.	2.00	25.	18.	18.	.18	
+	DIVERSION TO	DW256A	15.	2.00	5.	4.	4.	.18	
+	HYDROGRAPH AT	DE256A	216.	2.00	20.	14.	14.	.18	
+	DIVERSION TO	DW256B	87.	2.00	7.	5.	5.	.18	
+	HYDROGRAPH AT	DE256B	129.	2.00	13.	9.	9.	.18	
+	DIVERSION TO	DW256C	15.	2.00	3.	2.	2.	.18	
	HYDROGRAPH AT								

	DE256C	114.	2.00	10.	7.	7.	.18	
ROUTED TO								
	R256	97.	2.17	10.	7.	7.	.18	1019.07
2.17								
2 COMBINED AT								
	CPA1	97.	2.17	10.	7.	7.	.52	
ROUTED TO								
	RCPA1	74.	2.42	10.	7.	7.	.52	1024.39
2.42								
HYDROGRAPH AT								
	DW256A	15.	1.92	5.	4.	4.	.00	
HYDROGRAPH AT								
	DW256B	87.	2.00	7.	5.	5.	.00	
HYDROGRAPH AT								
	DW256C	15.	1.92	3.	2.	2.	.00	
HYDROGRAPH AT								
	DO67	248.	2.17	52.	38.	38.	.00	
4 COMBINED AT								
	CPSUB6	350.	2.08	67.	48.	48.	.00	
ROUTED TO								
	R12A	336.	2.25	67.	48.	48.	.00	1011.99
2.25								
HYDROGRAPH AT								
	12A	130.	1.67	21.	15.	15.	.07	
2 COMBINED AT								
	CP12A	394.	2.25	87.	63.	63.	.07	
HYDROGRAPH AT								
	271A1	87.	2.25	23.	17.	17.	.09	
HYDROGRAPH AT								
	SCE	132.	1.67	21.	15.	15.	.10	
HYDROGRAPH AT								
	SCW	136.	1.58	16.	12.	12.	.06	
2 COMBINED AT								
	CPSC	263.	1.67	37.	27.	27.	.16	
DIVERSION TO								
	DOSC	263.	2.33	29.	21.	21.	.16	
HYDROGRAPH AT								
	SCRET	84.	2.33	8.	6.	6.	.16	
4 COMBINED AT								
	1I12C	611.	2.33	128.	92.	92.	.84	
HYDROGRAPH AT								
	255A	603.	1.92	139.	100.	100.	.60	
HYDROGRAPH AT								
	D7OUT	130.	2.08	27.	20.	20.	.00	
2 COMBINED AT								
	CP255A	713.	2.00	166.	120.	120.	.60	
ROUTED TO								
	R12B	709.	2.08	166.	120.	120.	.60	1013.77
2.08								
HYDROGRAPH AT								
	12C	136.	1.67	22.	16.	16.	.08	
2 COMBINED AT								
	CP12B	799.	2.00	188.	136.	136.	.68	
HYDROGRAPH AT								
	12C	342.	1.75	43.	31.	31.	.15	
2 COMBINED AT								
	CP12C	1071.	1.92	231.	167.	167.	.83	

+	ROUTED TO						
+	SR12C	551.	2.67	185.	134.	134.	.83
2.67							1009.89

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

24-Hour
Existing Conditions HEC-1 Model

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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   12JUN02  TIME  06:56:21  *                                      *           (916)
756-1104             *
 *                                      *                                      *
*
 ****************************************
 ****************************************
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24 hr Existing

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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
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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


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          LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
            1           ID        DYSART RANCH HEC-1 MODEL
            2           ID        BY EEC MAY 2002   mjr
            3           ID        PORTIONS OF THIS MODEL WERE FROM
            4           ID        THE WLB GROUPD MODEL FOR SAGE CREEK MAY 1999 AND
            5           ID        THE FCDMC ORIGINAL MODEL FOR THE RID CANAL OVER-CHUTE DESIGN MAY 1997
            6           ID
            7           ID        100 YEAR, 24 HOUR STORM
            8           ID        EXISTING CONDITIONS
            9           ID        FILE: ~~DYR_24I~~ DyREx.24I
           10           ID
           11           ID
           12           ID
                        *DIAGRAM
           13           IT       5 01JAN94    0001     300
           14           IO       1
           15           IN      15
           16           JD    4.03    0.01
           17           PC    .000    .002    .005    .008    .011    .014    .017    .020    .023    .026
           18           PC    .029    .032    .035    .038    .041    .044    .048    .052    .056    .060
           19           PC    .064    .068    .072    .076    .080    .085    .090    .095    .100    .105
           20           PC    .110    .115    .120    .126    .133    .140    .147    .155    .163    .172
           21           PC    .181    .191    .203    .218    .236    .257    .283    .387    .663    .707
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          22          PC    .735    .758    .776    .791    .804    .815    .825    .834    .842    .849
          23          PC    .856    .863    .869    .875    .881    .887    .893    .898    .903    .908
          24          PC    .913    .918    .922    .926    .930    .934    .938    .942    .946    .950
          25          PC    .953    .956    .959    .962    .965    .968    .971    .974    .977    .980
          26          PC    .983    .986    .989    .992    .995    .998   1.00   1.000   1.000   1.000
          27          JD   3.99      10

          28          KK    2711
          29          KM    NEW SUBBASIN, PART OF THE PREVIOUS 271 NORTH OF INDIAN SCHOOL BYPASS
          30          BA    0.11
          31          LG     0.2    0.25     4.3    0.39      20
          32          UI      93     288     306     118      33      11       0       0       0       0
          33          UI       0       0       0       0       0       0       0       0       0       0

          34          KK    254A
          35          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 254A
          36          BA     .20
          37          LG     .12     .19    5.82     .21   20.00
          38          UI     72.    225.    404.    415.    246.    104.     51.     14.     13.      0.
          39          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
          40          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

          41          KK  R2711
          42          KM        ROUTE FLOW FROM CP254A TO CP270A
          43          KM        FROM CP254A TO THE PROPOSED INDIAN SCHOOL BYPASS
          44          RS       2              -1
          45          RC    0.05    0.05    0.05    2100  0.0025
          46          RX    1000    1001    1002    1180    1310    1398    1399    1400
          47          RY    1050    1017    1017    1016    1016    1017    1017    1050
1                                                 HEC-1 INPUT
PAGE  2

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

          48          KK  CP2711
          49          HC       2

          50          KK   1R12C
          51          KM
          52          KM        ROUTE FLOW FROM CP2711 TO MERGING POINT
          53          RS       1    FLOW      -1
          54          RC   0.015   0.015   0.015    1025  0.0015
          55          RX       0       5      15      20      26      31      41      46
          56          RY      10      10      10       5       5      10      10      10
                      * ************************************************************

          57          KK     257
          58          KM   BASIN 257
          59          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          60          KM    L=      1.2  Lca=       .6   S=   11.6  Kn= .050  LAG=  40.3
          61          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
          62          BA     .34
          63          LG     .25     .15    8.80    0.25   30.00
          64          UI     28.     38.    105.    141.    168.    203.    258.    356.    298.    242.
          65          UI    201.    164.    132.     91.     50.     47.     31.     28.      9.      9.
          66          UI      9.      9.      9.      9.      0.      0.      0.      0.      0.      0.
          67          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

          68          KK    257D
          69          KM        DIVERT OUT ONSITE RETENTION
          70          DT   257DO   36.54
          71          DI       0    1000
          72          DQ       0    1000

          73          KK    D257
          74          KM        DIVERT FROM CP257 TO CP256
          75          DT   DI256
          76          DI       0      56    1308
          77          DQ       0       0     922

          78          KK    R257
          79          KM        ROUTE FLOW FROM 271B1 TO CPA1
          80          KM
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          81          KM
          82          RS       3    FLOW      -1
          83          RC   0.035   0.025   0.035    2600   0.002
          84          RX       0       5       8      18      26     215     220     230
          85          RY    1021    1020    1018    1018    1020    1020    1020    1021

          86          KK    D257
          87          KM        RETURN DIVERT AT CP257
          88          DR   DI256
1                                        HEC-1 INPUT
PAGE  3

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

          89          KK   RD257
          90          KM        ROUTE DIVERT FROM CP257 TO CP256
          91          KM     *********   RENAMED FROM R257 TO RD257  *****    BY WLB MAY 1999
          92          RS      12              -1       0
          93          RC    .035    .035    .075    2680   .0018
          94          RX    1000    1001    1002    1010    1540    1858    1859    1860
          95          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

          96          KK     256
          97          KM   BASIN 256
          98          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
          99          KM    L=      1.2  Lca=       .6   S=   11.6  Kn= .070  LAG=  56.4
         100          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
         101          BA     .43
         102          LG     .35     .15    8.80    0.22   18.00
         103          UI     26.     26.     49.     93.    120.    138.    155.    178.    204.    264.
         104          UI    324.    290.    242.    213.    187.    161.    139.    121.     91.     62.
         105          UI     45.     42.     36.     26.     26.     12.      8.      8.      8.      8.
         106          UI      8.      8.      8.      0.      0.      0.      0.      0.      0.      0.
         107          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

         108          KK    256D
         109          KM        DIVERT OUT ONSITE RETENTION
         110          DT   256DO    37.6
         111          DI       0    1000
         112          DQ       0    1000

         113          KK   CP256
         114          KM        COMBINE 256 AND RD257
         115          HC       2

         116          KK  DE256B
         117          KM        DIVERT AT INTERSECTION OF INDIAN SC. AND DYSART RD
         118          KM        WEIR SECTION THROUGH CENTER OF INTERSECTION
         119          DT  DW256B
         120          DI       0       7      90     276     655
         121          DQ       0       0      25     116     495

         122          KK    R256
         123          KM     ROUTE REMAINING FLOW ALONG THE EAST SIDE OF DYSART RD
         124          RS       3    FLOW      -1       0
         125          RC    .035   0.025   0.035    1300   0.003
         126          RX    1000    1001    1002    1010    1110    1120    1859    1860
         127          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

         128          KK   271B2
         129          KM   BASIN 271B2
         130          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
         131          KM    L=       .4  Lca=       .2   S=   10.8  Kn= .120  LAG=  40.1
         132          KM    AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
         133          BA     .04
         134          LG     .50     .00    3.95     .76     .00
         135          UI      6.     21.     26.     19.      9.      4.      2.      1.      0.      0.
         136          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1                                        HEC-1 INPUT
PAGE  4

        LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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 137          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 138          KK     RB2
 139          KM        ROUTE FLOW FROM 271B1 TO CPA1
 140          KM
 141          KM
 142          RS     2.5    FLOW      -1
 143          RC   0.035   0.025   0.035    2600   0.002
 144          RX       0       5       8      18      26     215     220     230
 145          RY    1021    1020    1018    1018    1020    1020    1020    1021

 146          KK    271B1
 147          KM    BASIN 271B1
 148          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 149          KM     L=       .2  Lca=       .1   S=   11.1  Kn= .120  LAG=  22.8
 150          KM     AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
 151          BA      .01
 152          LG      .50     .00    3.95     .76     .00
 153          UI       8.     17.      8.      2.      1.      0.      0.      0.      0.      0.
 154          UI       0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 155          KK     RB1
 156          KM        ROUTE FLOW FROM 271B1 TO CPA1
 157          KM
 158          KM
 159          RS       2    FLOW      -1
 160          RC   0.035   0.025   0.035    2000   0.002
 161          RX       0       5       8      18      26     215     220     230
 162          RY    1021    1020    1018    1018    1020    1020    1020    1021

 163          KK    271A1
 164          KM    BASIN 271A1
 165          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 166          KM     L=       .5  Lca=       .3   S=   11.5  Kn= .120  LAG=  50.8
 167          KM     AGRICULTURAL S-GRAPH WAS USED FOR THIS BASIN
 168          BA      .07
 169          LG      .50     .00    7.00     .19     .00
 170          UI       7.     26.     41.     39.     29.     17.      9.      5.      3.      2.
 171          UI       1.      1.      1.      1.      1.      0.      0.      0.      0.      0.
 172          UI       0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 173          KK     CPA1
 174          KM        COMBINE FLOWS AT NE CORNER OF SAGE CREEK
 175          HC       5

 176          KK    R256A
 177          KM     ROUTE REMAINING FLOW ALONG THE EAST SIDE OF DYSART RD
 178          KM     *********                                    **    BY WLB MAY 1999
 179          RS       2    FLOW      -1       0
 180          RC    .035   0.025   0.035    1600   0.003
 181          RX    1000    1001    1002    1010    1110    1120    1859    1860
 182          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5
1
                                    HEC-1 INPUT
PAGE  5

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

 183          KK      SCE
 184          KM    BASIN SCE
 185          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 186          KM     L=       .5  Lca=       .2   S=   18.4  Kn= .035  LAG=  12.3
 187          KM     PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 188          BA      .10
 189          LG     0.12     .25    3.95     .60   42.00
 190          UI       60.    175.    284.    158.     55.     18.      8.      0.      0.      0.
 191          UI       0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 192          KK      SCW
 193          KM    BASIN SCW
 194          KM     THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 195          KM     L=       .4  Lca=       .1   S=   20.6  Kn= .035  LAG=   7.4
 196          KM     PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 197          BA      .06
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198          LG     .26     .25    4.35     .49   42.00
199          UI   100.    256.     91.     14.      0.      0.      0.      0.      0.      0.
200          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

201          KK   CPW
202          KM        COMBINE AND ROUTE ONSITE RUNOFF THROUGH STORAGE BASINS
203          HC       2

204          KK  RSCW_E
205          KM       RETENTION BASINS WITH SAGE CREEK DEVEL.
206          KM        OUTFLOW IS ASSUMED TO BE THROUGH LOW FLOW PIPES
207          KM        DRYWELLS MY ALSO BE USED
208          RS       1    STOR       0
209          SV       0       3       8    13.9    14.6
210          SE    1015    1016    1017    1018  1018.5
211          SQ       0       5       5       5     100

212          KK   CPSCW
213          KM        COMBINE AND ROUTE ONSITE RUNOFF THROUGH STORAGE BASINS
214          HC       2

215          KK    SUB6
216          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
217          KM    L=      1.1  Lca=       .6   S=   19.0  Kn= .030  LAG=  20.0
218          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
219          BA     .10
220          LG     .17     .20    6.00     .16   20.00
221          UI     21.     75.    114.    189.    162.    109.     65.     30.     17.      5.
222          UI      5.      0.      0.      0.      0.      0.      0.      0.      0.      0.
223          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

224          KK    SUB7
225          KM   BASIN SUB7
226          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
227          KM    L=      1.0  Lca=       .5   S=   21.0  Kn= .030  LAG=  19.0
228          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
229          BA     .24
230          LG     .19     .19    6.80     .20    3.00
1                                    HEC-1 INPUT
PAGE   6

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

231          UI     55.    192.    294.    483.    362.    238.    117.     60.     28.     13.
232          UI     13.      0.      0.      0.      0.      0.      0.      0.      0.      0.
233          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

234          KK      D7
235          KM   DIVERT D7 TO CP255A
236          DT   D7OUT
237          DI       0     250
238          DQ       0     125

239          KK   DR256
240          KM        ADD OVERFLOW FROM CP256 TO BE ROUTED WITH RSUB6 TO CP271A
241          DR  DW256B

242          KK  CPSUB6
243          KM    *** OPPERATION RENAMED BY THE WLB GROUP MAY 1999
244          KM        ADD HYDROGRAPHS AT CPSUB6
245          HC       3

246          KK    R12A
247          KM        ROUTE CPSUB 6 TO CP12A
248          KM
249          RS       3    FLOW      -1       0
250          RC    .035   0.028   0.035    2500  0.0007
251          RX    2000    2000    2010    2035    2075    2095    2100    2100
252          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016

253          KK   2712a
254          KM   BASIN 2712a
255          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
256          KM    L=       .6  Lca=       .3   S=   10.7  Kn= .050  LAG=  22.0
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257          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
258          BA     .07
259          LG     .35     .30    8.00     .08     .00
260          UI     11.     44.     65.     99.    123.     83.     58.     30.     17.     10.
261          UI      3.      3.      3.      0.      0.      0.      0.      0.      0.      0.
262          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

263          KK  CP12A
264          KM
265          HC       2

266          KK   4R12C
267          KM        ROUTE CP12A TO 1I12C
268          KM
269          RS       1    FLOW      -1       0
270          RC    .035   0.025   0.035     400  0.0007
271          RX    2000    2000    2010    2035    2075    2095    2100    2100
272          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016
1                                          HEC-1 INPUT
PAGE   7

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

273          KK  1I12C
274          KM        ADD HYDROGRAPHS AT 1I12C
275          HC       2

276          KK   2R12C
277          KM        ROUTE 1I12C TO CP12C
278          KM
279          RS       2    FLOW      -1       0
280          RC    .035    .028   0.035    2850   0.005
281          RX    2000    2005    2010    2025    2055    2070    2075    2080
282          RY    1012    1011  1010.5  1005.5  1005.5  1010.5    1011    1012

283          KK    255A
284          KM        RUNOFF HYDROGRAPH FROM SUB-BASIN 255A
285          BA   .5968
286          LG     .20     .22    3.88     .29   12.00
287          UI     91.    359.    542.    814.   1029.    707.    492.    268.    147.     86.
288          UI     28.     28.     28.      0.      0.      0.      0.      0.      0.      0.
289          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

290          KK   D7OUT
291          KM        RETURN DIVERT TO 255A
292          DR   D7OUT

293          KK   R255A
294          KM        ROUTE DIVERT FORM SUB 7 TO CP255A
295          KM
296          RS       1    FLOW      -1       0
297          RC    .035   0.025   0.035     1000  0.002
298          RX    2000    2000    2010    2015    2045    2050    2060    2060
299          RY    1018    1017    1012    1015    1015    1012    1017    1018

300          KK  CP255A
301          KM        ADD HYDROGRAPHS AT CP255A
302          HC       2

303          KK    R12B
304          KM        ROUTE CP255A TO CP12C
305          KM
306          RS       2    FLOW      -1       0
307          RC    .035    .028   0.035    1400   .0011
308          RX    2000    2000    2010    2035    2080    2112    2122    2122
309          RY  1018.5    1018  1017.9  1010.9  1011.6  1017.9    1018  1018.5

310          KK   2712b
311          KM   BASIN 2712b
312          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
313          KM    L=       .5  Lca=       .2   S=   29.6  Kn= .048  LAG=    9.9
314          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
315          BA     .08
```

```
316          LG     .33     .30    8.00     .08    7.00
317          UI     76.    240.    209.     71.     16.      0.      0.      0.      0.      0.
318          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1                                        HEC-1 INPUT
PAGE  8

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

319          KK   CP12B
320          KM   PEAK FLOW PLAZE DRIVE CULEVRTS
321          HC       2

322          KK   2712C
323          KM   BASIN 2712c
324          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
325          KM    L=        .5  Lca=        .0   S=     7.5  Kn= .041  LAG=    9.3
326          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
327          BA     .15
328          LG     .21     .38    5.60     .20   42.00
329          UI    163.    509.    371.    102.     23.      0.      0.      0.      0.      0.
330          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

331          KK   2I12C
332          KM   COMBINE THREE FLOWS
333          HC       3

334          KK   SR12C
335          KM        STORAGE ROUTE CP12C BEHIND ROOSEVELT CANAL
336          KM
337          RS       1    STOR       0
338          SV     0.0     6.6    25.9    55.2
339          SE    1006    1008    1010    1012
340          SQ      25     150     650    1200

341          KK   3R12C
342          KM        ROUTE SR12C TO 3I12C (MERGE POINT)
343          KM
344          RS       3    FLOW      -1       0
345          RC    .035   0.025   0.035     900    .001
346          RX    9968    9968    9970    9990   10010   10030   10032   10032
347          RY    1013  1012.5  1012.5  1006.7  1006.7  1012.5  1012.5    1013

348          KK  MERGE
349          KM        COMBINED Q'S ALONG INDIAN SCH.RD. INTO OVERCHUTE
350          HC       2

351          KK  R271_1
352          KM    ROUTE THE MERGING POINT OF TWO CHANNELS TO LITCH, 3/8/96, FCD
353          RD
354          RC   0.015   0.015   0.015     625  0.0015
355          RX      10      11      12      12      42      42      43      44
356          RY      10      10      10     5.0     5.0      10      10      10

357          KK     270
358          KM   BASIN 270
359          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN** REVISED BY FCD
360          KM    L=        .7  Lca=        .3   S=    10.5  Kn= .030  LAG=   16.0
361          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
362          BA   .2936
363          LG     .16     .22    3.58     .38   18.00
364          UI    100.    319.    558.    621.    371.    170.     78.     26.     19.      0.
365          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
1                                        HEC-1 INPUT
PAGE  9

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

366          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

367          KK   2712d
368          KM   BASIN 2712d
369          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
370          KM    L=        .3  Lca=        .1   S=    11.1  Kn= .020  LAG=    5.1
```

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371           KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
372           BA     .02
373           LG     .10      .25     4.70      .45    80.00
374           UI     82.      81.       8.       0.       0.       0.       0.       0.       0.       0.
375           UI      0.       0.       0.       0.       0.       0.       0.       0.       0.       0.

376           KK   LITCH
377           KM   OVER-CHUTE FLOW
378           KM      PEAK DISCHARGE IN THE NEW RID CANAL CHANNEL
379           HC       3
380           ZZ
1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING           (--->) DIVERSION OR PUMP FLOW

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

    28        2711
                .
                .
    34          .         254A
                .            V
                .            V
    41          .       R2711
                .            .
                .            .
    48        CP2711.............
                 V
                 V
    50         1R12C
                .
                .
    57          .          257
                .            .
                .            .
    70          .            .--------->   257DO
    68          .         257D
                .            .
                .            .
    75          .            .--------->   DI256
    73          .         D257
                .            V
                .            V
    78          .         R257
                .            .
                .            .
    88          .            .            .<--------   DI256
    86          .            .         D257
                .            .            V
                .            .            V
    89          .            .        RD257
                .            .            .
                .            .            .
    96          .            .            .          256
                .            .            .           .
                .            .            .           .
   110          .            .            .           .--------->   256DO
   108          .            .            .         256D
                .            .            .           .
                .            .            .           .
   113          .            .        CP256.............
                .            .            .
                .            .            .
   119          .            .            .--------->  DW256B
   116          .            .       DE256B
                .            .            V
                .            .            V
   122          .            .         R256
                .            .            .
                .            .            .
   128          .            .            .        271B2
                .            .            .           V
                .            .            .           V
```
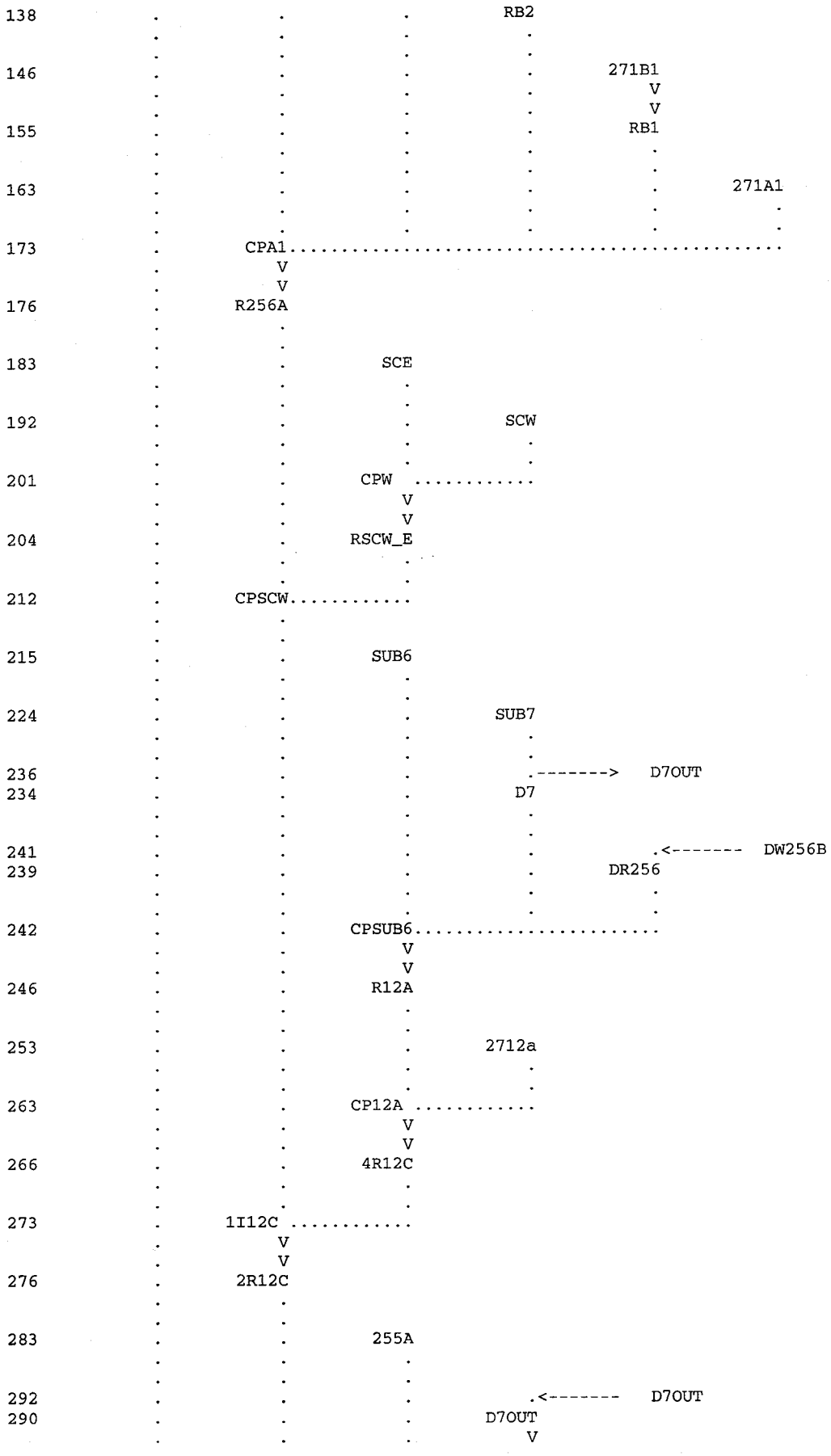
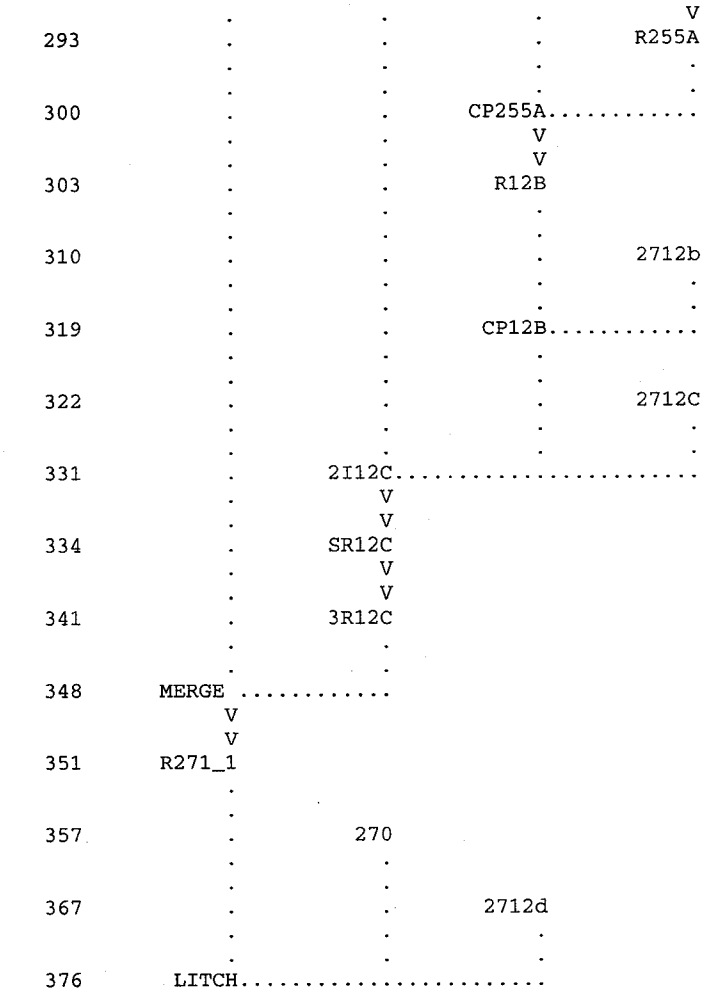


138
RB2
146
271B1
155
RB1
163
271A1
173
CPA1
176
R256A
183
SCE
192
SCW
201
CPW
204
RSCW_E
212
CPSCW
215
SUB6
224
SUB7
236
D7OUT
234
D7
241
DW256B
239
DR256
242
CPSUB6
246
R12A
253
2712a
263
CP12A
266
4R12C
273
1I12C
276
2R12C
283
255A
292
D7OUT
290
D7OUT



(***) 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   12JUN02  TIME  06:56:21   *                                   *           (916)
756-1104             *
 *                                       *                                   *
*
 *****************************************
*************************************
```

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	2711	234.	12.00	18.	5.	5.	.11
HYDROGRAPH AT	254A	404.	12.08	36.	10.	10.	.20
ROUTED TO	R2711	281.	12.33	36.	10.	10.	.20
2 COMBINED AT	CP2711	385.	12.08	54.	15.	15.	.31
ROUTED TO	1R12C	375.	12.17	54.	15.	15.	.31
HYDROGRAPH AT	257	391.	12.50	64.	19.	19.	.34
DIVERSION TO	257DO	391.	12.50	64.	18.	18.	.34
HYDROGRAPH AT	257D	4.	19.67	3.	1.	1.	.34
DIVERSION TO	DI256	0.	.00	0.	0.	0.	.34
HYDROGRAPH AT	D257	4.	19.67	3.	1.	1.	.34
ROUTED TO	R257	4.	20.58	3.	1.	1.	.34
HYDROGRAPH AT	D257	0.	.00	0.	0.	0.	.34
ROUTED TO	RD257	0.	.00	0.	0.	0.	.34
HYDROGRAPH AT	256	379.	12.75	73.	21.	20.	.43
DIVERSION TO	256DO	379.	12.75	72.	19.	18.	.43
HYDROGRAPH AT	256D	15.	14.58	5.	2.	2.	.43
2 COMBINED AT	CP256	15.	14.58	5.	2.	2.	.43
DIVERSION TO	DW256B	3.	14.58	0.	0.	0.	.43
HYDROGRAPH AT	DE256B	13.	14.58	5.	2.	2.	.43
ROUTED TO	R256	8.	15.17	5.	2.	2.	.43
HYDROGRAPH AT	271B2	21.	12.08	1.	0.	0.	.04
ROUTED TO	RB2	13.	12.33	1.	0.	0.	.04
HYDROGRAPH AT	271B1	10.	12.00	1.	0.	0.	.01
ROUTED TO	RB1	5.	12.25	1.	0.	0.	.01
HYDROGRAPH AT	271A1	45.	12.08	5.	1.	1.	.07

5 COMBINED AT	CPA1	58.	12.17	9.	4.	4.	.89
ROUTED TO	R256A	47.	12.33	9.	4.	4.	.89
HYDROGRAPH AT	SCE	206.	12.08	19.	6.	6.	.10
HYDROGRAPH AT	SCW	147.	12.00	12.	4.	4.	.06
2 COMBINED AT	CPW	333.	12.00	30.	10.	9.	.16
ROUTED TO	RSCW_E	9.	13.58	6.	4.	3.	.16
2 COMBINED AT	CPSCW	52.	12.33	15.	7.	7.	1.05
HYDROGRAPH AT	SUB6	189.	12.17	20.	6.	5.	.10
HYDROGRAPH AT	SUB7	429.	12.17	37.	9.	9.	.24
DIVERSION TO	D7OUT	215.	12.17	18.	5.	5.	.24
HYDROGRAPH AT	D7	215.	12.17	18.	5.	5.	.24
HYDROGRAPH AT	DR256	3.	14.58	0.	0.	0.	.43
3 COMBINED AT	CPSUB6	403.	12.17	38.	10.	10.	.34
ROUTED TO	R12A	335.	12.42	38.	10.	10.	.34
HYDROGRAPH AT	2712a	121.	12.25	12.	3.	3.	.07
2 COMBINED AT	CP12A	437.	12.33	50.	13.	13.	.41
ROUTED TO	4R12C	425.	12.33	50.	13.	13.	.41
2 COMBINED AT	1I12C	476.	12.33	64.	21.	20.	1.46
ROUTED TO	2R12C	457.	12.50	64.	20.	20.	1.46
HYDROGRAPH AT	255A	959.	12.25	96.	26.	25.	.60
HYDROGRAPH AT	D7OUT	215.	12.17	18.	5.	5.	.24
ROUTED TO	R255A	203.	12.25	18.	5.	5.	.24
2 COMBINED AT	CP255A	1161.	12.25	115.	31.	30.	.60
ROUTED TO	R12B	1119.	12.25	115.	31.	30.	.60
HYDROGRAPH AT							

+	2712b	192.	12.00	14.	4.	4.	.08
2 COMBINED AT							
+	CP12B	1169.	12.25	129.	35.	33.	.68
HYDROGRAPH AT							
+	2712C	370.	12.00	31.	10.	9.	.15
3 COMBINED AT	CP12C						
+	~~2712C~~	1546.	12.33	221.	65.	62.	2.29
ROUTED TO							
+	SR12C	934.	12.58	221.	74.	72.	2.29
ROUTED TO							
+	3R12C	930.	12.58	221.	74.	72.	2.29
2 COMBINED AT							
+	MERGE	1151.	12.50	275.	89.	87.	2.60
ROUTED TO							
+	R271_1	1146.	12.58	275.	89.	87.	2.60
HYDROGRAPH AT							
+	270	549.	12.08	48.	14.	13.	.29
HYDROGRAPH AT							
+	2712d	61.	12.00	6.	2.	2.	.02
3 COMBINED AT							
+	LITCH	1335.	12.17	328.	105.	102.	2.91

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)
FOR STORM = 1 STORM AREA (SQ MI) = .01									
R271_1	MANE	.99	1159.54	752.73	1.31	5.00	1157.38	755.00	1.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1811E+03 EXCESS= .0000E+00 OUTFLOW= .1811E+03 BASIN STORAGE= .1366E-02
PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = 10.00									
R271_1	MANE	.99	1144.85	753.14	1.29	5.00	1143.33	755.00	1.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1787E+03 EXCESS= .0000E+00 OUTFLOW= .1787E+03 BASIN STORAGE= .1365E-02
PERCENT ERROR= .0

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

6-Hour
Existing Conditions HEC-1 Model

```
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   12JUN02  TIME  06:56:08   *                                       *           (916)
756-1104           *
 *                                       *                                       *
*
 *****************************************
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```

6hr. Existing

```
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

            1           ID        DYSART RANCH
            2           ID        100-YEAR, 6HOUR STORM
            3           ID        HEC-1 MODEL
            4           ID        BY EEC MAY 2002      mjr
            5           ID        Existing Conditions
            6           ID        FILE: DYR.6I  D:\6Ex.6I
            7           ID
            8           IT      5             700
                        *DIAGRAM

            9           KK    SUB6
           10           KM
           11           PB    3.10
           12           PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.075
           13           PC   0.087   0.099   0.119   0.148   0.230   0.407   0.778   0.881   0.919   0.945
           14           PC   0.957   0.968   0.980   0.990    1.00
           15           BA     0.1
           16           LG   0.170   0.200    6.00   0.160    20.0
           17           UC   0.979   0.815            0.00
           18           UA       0       3       5       8      12      20      43      75      90      96
           19           UA     100

           20           KK    SUB7
           21           KM
           22           BA    0.24
           23           LG    0.19   0.190    6.80   0.200    3.00
           24           UC   0.979   0.815            0.00
```

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 25          UA       0       3       5       8      12      20      43      75      90      96
 26          UA     100

 27          KK      D7
 28          KM        DIVERT FROM D7 TO CP255A        50/50 SPLIT
 29          DT   D7OUT
 30          DI       0     250
 31          DQ       0     125

 32          KK  C6
 33          KM
 34          HC       2

 35          KK     D67
 36          KM  DIVERT ALL FLOW TO CP271A
 37          DT    DO67
 38          DI       0     522
 39          DQ       0     522

 40          KK     256
 41          KM   SUB-BASIN 256
 42          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
 43          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
 44          KM     L = 1.07  Kb = .036  Adj. Slope =   21.0
 45          BA    .184
 46          LG    .080    .280   7.000    .140  64.000
 47          UC    .533    .510
 48          UA       0       5      16      30      65      77      84      90      94      97
1                                        HEC-1 INPUT
PAGE  2

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

 49          UA     100

 50          KK  256RET
 51          KM        DIVERT ONSITE RETENTION OUT    100 2 hour
 52          DT   DO256    14.8
 53          DI       0    1000
 54          DQ       0    1000

 55          KK  DE256A
 56          KM        DIVERT THROUGH STORM DRAIN INLET
 57          KM        15CFS INTO DYSART ROAD CHANNEL
 58          DT  DW256A
 59          DI       0      15      20      50     250     600
 60          DQ       0      15      15      15      15      15

 61          KK  DE256B
 62          KM        DIVERT WEIR FLOW AT INTERSECTION OF IN SC. AND DYSART
 63          DT  DW256B
 64          DI       0       7      90     276     655
 65          DQ       0       0      25     116     164

 66          KK  DE256C
 67          KM   DIVERT OUT   stormdrain in dysart(south of intersection)
 68          DT  DW256C
 69          DI       0      15      20      50     250     600
 70          DQ       0      15      15      15      15      15

 71          KK    R256
 72          KM   ROUTE REMAINING FLOW TO CPA1
 73          RS       2      -1
 74          RC   0.035   0.025   0.015    1300   0.004
 75          RX    1000    1001    1026    1056    1068    1069    1100    1101
 76          RY    1020  1018.9  1018.7  1018.1  1018.7  1018.7  1019.3  1019.8

 77          KK    CPA1
 78          KM        COMBINE FLOWS AT NORTHEAST CORNER OF SAGE CREEK
 79          HC       2

 80          KK   RCPA1
 81          KM        ROUTE ALONG EAST SIDE OF DYSART ROAD
 82          RS       2    FLOW      -1
 83          RC   0.035   0.025   0.035    1600   0.003
 84          RX    1000    1001    1002    1010    1110    1200    1859    1860
 85          RY  1025.5    1025    1025    1024    1024    1025    1025  1025.5

 86          KK  DW256A
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```
 87          KM        RETURN STORM DRAIN DIVERT
 88          DR  DW256A

 89          KK  DW256B
 90          KM        RETURN WEIR FLOW
 91          DR  DW256B
1                                    HEC-1 INPUT
PAGE  3

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

 92          KK  DW256C
 93          KM        RETURN STORM DRAIN DIVERT
 94          DR  DW256C

 95          KK    DO67
 96          KM        RETURN CPSUB6 DIVERT
 97          DR    DO67

 98          KK  CPSUB6
 99          KM
100          HC       4

101          KK    R12A
102          KM        ROUTE CPSUB 6 TO CP12A
103          KM
104          RS       3    FLOW      -1       0
105          RC    .035   0.028   0.035    2500   0.002
106          RX    2000    2000    2010    2035    2075    2095    2100    2100
107          RY    1016    1014  1014.2  1009.8  1010.2    1014    1014    1016

108          KK     12A
109          KM   SUB-BASIN 2712a
110          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
111          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
112          KM     L = 1.60  Kb = .057  Adj. Slope =   15.0
113          BA    .071
114          LG    .350    .300   8.000    .080    .000
115          UC   1.250   3.118
116          UA       0       5      16      30      65      77      84      90      94      97
117          UA     100

118          KK   CP12A
119          KM        PEAK FLOW AT OSBORN CULVERTS
120          HC       2

121          KK   271A1
122          KM   SUB-BASIN 271A1
123          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
124          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
125          KM     L =  .63  Kb = .106  Adj. Slope =   11.0
126          BA    .089
127          LG    .500    .000   6.800    .210    .000
128          UC   1.050   1.072
129          UA       0       3       5       8      12      20      43      75      90      96
130          UA     100

131          KK   SCE
132          KM   SUB-BASIN SCE
133          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
134          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
135          KM     L =  .50  Kb = .054  Adj. Slope =   10.0
136          BA    .098
137          LG    .140    .250   3.950    .580  19.000
138          UC    .688    .527
1                                    HEC-1 INPUT
PAGE  4

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

139          UA       0       5      16      30      65      77      84      90      94      97
140          UA     100

141          KK   SCW
142          KM   SUB-BASIN SCW
143          KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
144          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .987
145          KM     L =  .36  Kb = .057  Adj. Slope =   11.0
```

```
BA    .060
LG    .140     .150    8.400     .090   19.000
UC    .475     .355
UA       0        5       16       30       65       77       84       90       94       97
UA     100

KK   CPSC
KM    COMBINE FLOW AT SAGE CREEK
HC       2

KK  SCRET
KM        DIVERT ONSITE RETENTION OUT
DT   DOSC     14.6
DI       0     1000
DQ       0     1000

KK   1I12c
KM        COMBINE ALL FLOW AT DYSART ROAD AND RID CANAL WEST SIDE OF ROAD
HC       4

KK   255A
KM   SUB-BASIN 255A
KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF   .987
KM     L = 1.60  Kb = .050  Adj. Slope =    15.0
BA    .597
LG     0.2     0.22     3.88     0.29     12.0
UC   1.079    0.787
UA       0        5       16       30       65       77       84       90       94       97
UA     100

KK   D7OUT
KM        RETURN SUB 7 DIVERT
DR   D7OUT

KK  CP255A
KM        COMBINE 255A AND SUB 7
HC       2

KK    R12B
KM        ROUTE CP255A TO CP12C
KM
RS       2     FLOW       -1        0
RC    .035     .028    0.035     1400     .002
RX    2000     2000     2010     2035     2080     2127     2122     2123
RY  1018.5     1018   1017.9   1010.9   1010.9   1017.9     1018   1018.5
```



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

KK    12b
KM   SUB-BASIN 2712b
KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF   .987
KM     L =   .54  Kb = .054  Adj. Slope =    11.0
BA    .080
LG    .330     .300    8.000     .080    7.000
UC    .613     .553
UA       0        5       16       30       65       77       84       90       94       97
UA     100

KK   CP12B
KM        PEAK FLOW AT PLAZA DRIVE CULVERTS
HC       2

KK   12C
KM   SUB-BASIN 2712c
KM   6-HOUR RAINFALL, PATTERN NO. 1.40 WAS USED TO FIND TC & R FOR THIS BASIN
KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF   .987
KM     L =   .57  Kb = .041  Adj. Slope =     7.0
BA    .152
LG    .210     .380    5.600     .200   42.000
UC    .633     .416
UA       0        5       16       30       65       77       84       90       94       97
UA     100

KK   CP12C
```

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209           KM        PEAK INLFOW TO EXITING STORAGE BASIN
210           HC       2

211           KK   SR12C
212           KM        STORAGE ROUTE CP12C BEHIND ROOSEVELT CANAL
213           KM
214           RS       1    STOR       0
215           SV     0.0     6.6    25.9    55.2
216           SE    1006    1008    1010    1012
217           SQ      25     150     650    1200
218           ZZ
```
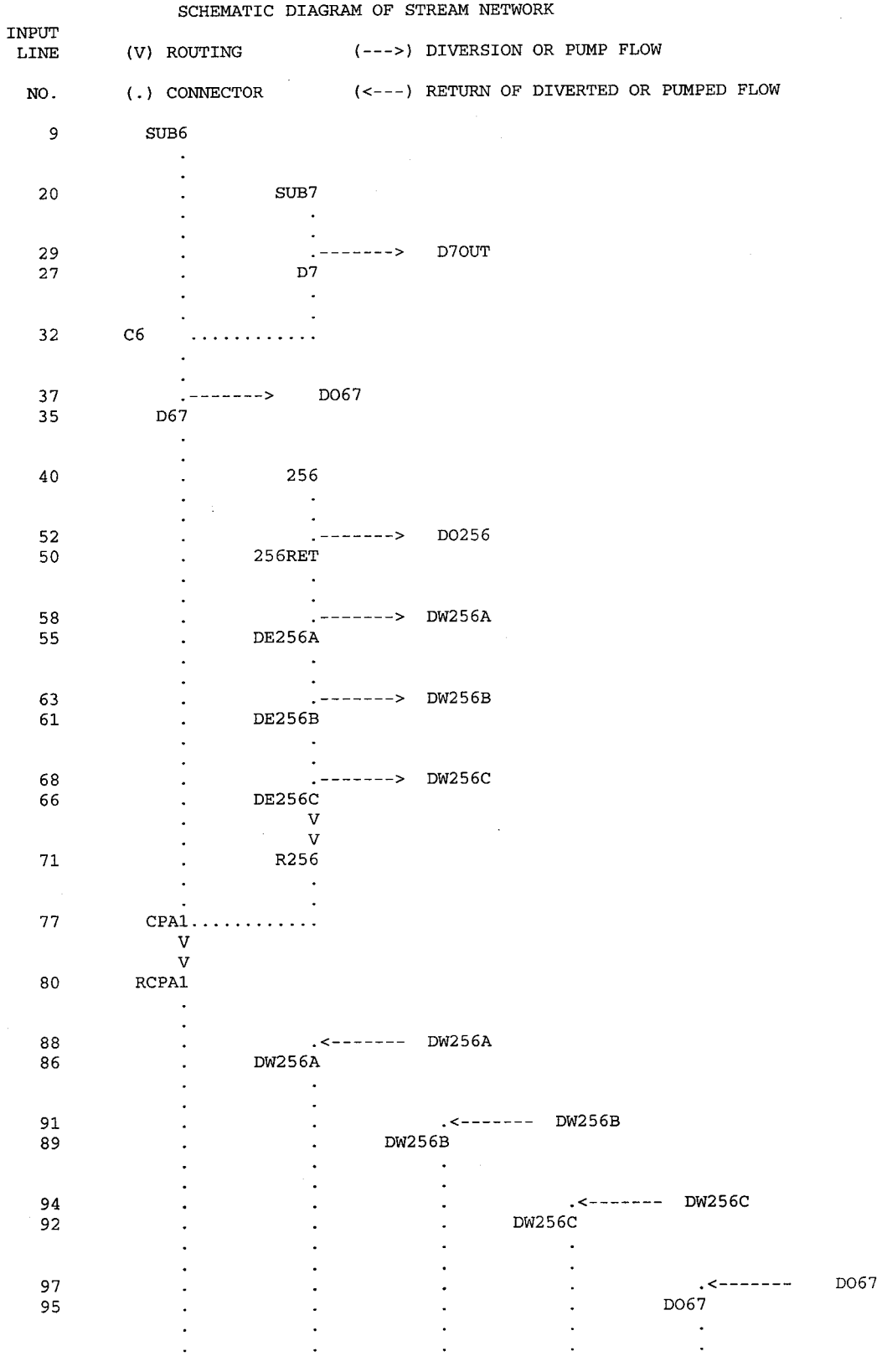
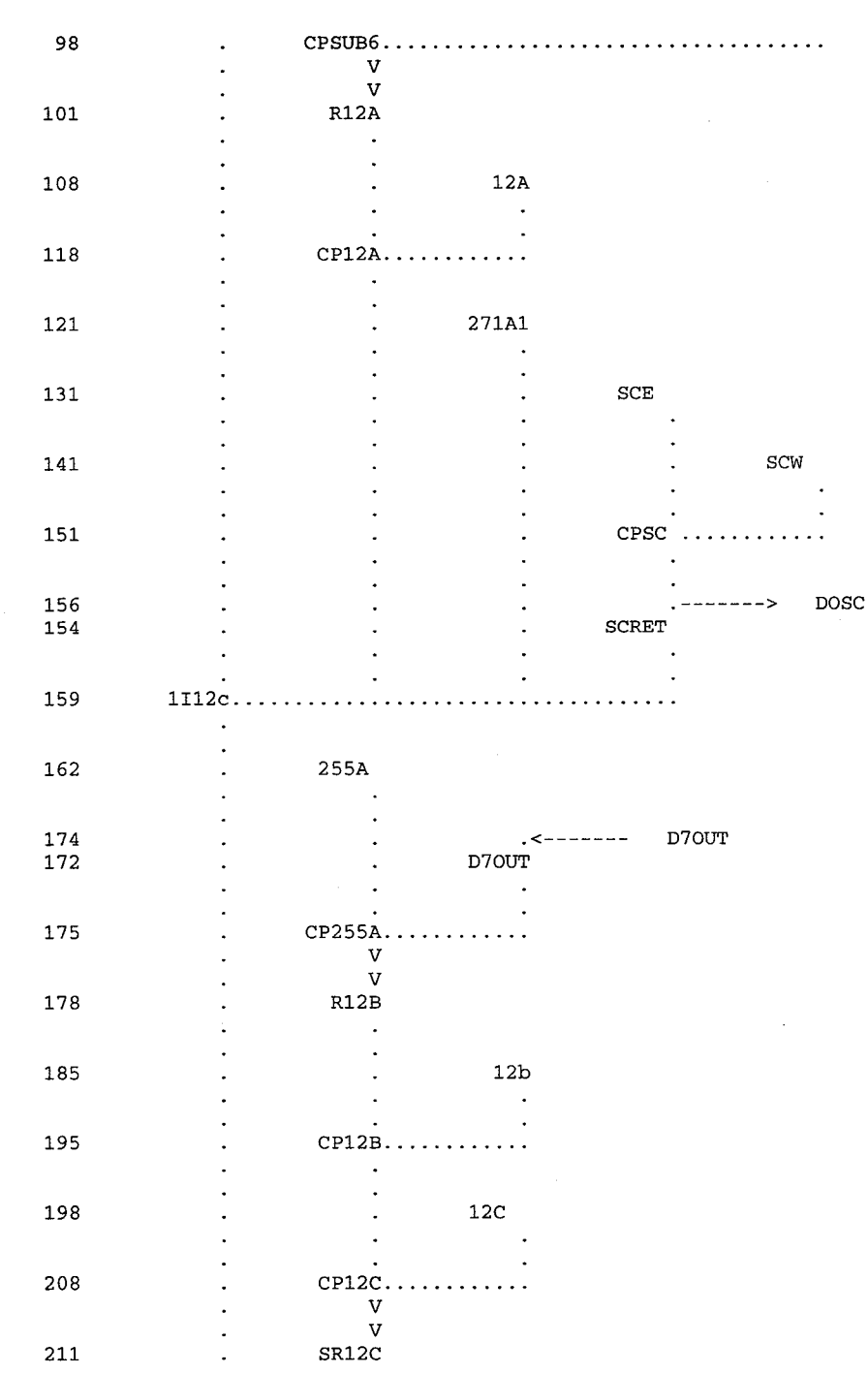

1

SCHEMATIC DIAGRAM OF STREAM NETWORK





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1**********

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 *                                   *                                   *
*
 *   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   12JUN02  TIME  06:56:08   *                                   *           (916)
756-1104            *
 *                                     *                                   *
*
 ***************************************
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1

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

TIME OF MAX STAGE	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE
	HYDROGRAPH AT	SUB6	118.	2.17	25.	18.	18.	.10	
	HYDROGRAPH AT	SUB7	261.	2.08	54.	39.	39.	.24	
	DIVERSION TO	D7OUT	130.	2.08	27.	20.	20.	.24	
	HYDROGRAPH AT	D7	130.	2.08	27.	20.	20.	.24	
	2 COMBINED AT	C6	248.	2.17	52.	38.	38.	.34	
	DIVERSION TO	DO67	248.	.00	52.	38.	38.	.34	
	HYDROGRAPH AT	D67	0.	.00	0.	0.	0.	.34	
	HYDROGRAPH AT	256	341.	1.67	54.	39.	39.	.18	
	DIVERSION TO	DO256	341.	2.00	30.	21.	21.	.18	
	HYDROGRAPH AT	256RET	231.	2.00	25.	18.	18.	.18	
	DIVERSION TO	DW256A	15.	2.00	5.	4.	4.	.18	
	HYDROGRAPH AT	DE256A	216.	2.00	20.	14.	14.	.18	
	DIVERSION TO	DW256B	87.	2.00	7.	5.	5.	.18	
	HYDROGRAPH AT	DE256B	129.	2.00	13.	9.	9.	.18	
	DIVERSION TO	DW256C	15.	2.00	3.	2.	2.	.18	
	HYDROGRAPH AT	DE256C	114.	2.00	10.	7.	7.	.18	
	ROUTED TO	R256	97.	2.17	10.	7.	7.	.18	1019.07
2.17									
	2 COMBINED AT	CPA1	97.	2.17	10.	7.	7.	.52	
	ROUTED TO	RCPA1	74.	2.42	10.	7.	7.	.52	1024.39
2.42									
	HYDROGRAPH AT	DW256A	15.	1.92	5.	4.	4.	.00	
	HYDROGRAPH AT	DW256B	87.	2.00	7.	5.	5.	.00	
	HYDROGRAPH AT								

+	DW256C	15.	1.92	3.	2.	2.	.00
HYDROGRAPH AT							
+	DO67	248.	2.17	52.	38.	38.	.00
4 COMBINED AT							
+	CPSUB6	350.	2.08	67.	48.	48.	.00
ROUTED TO							
+	R12A	336.	2.25	67.	48.	48.	.00
+							1011.99
2.25							
HYDROGRAPH AT							
+	12A	24.	2.33	13.	10.	10.	.07
2 COMBINED AT							
+	CP12A	361.	2.25	81.	59.	59.	.07
HYDROGRAPH AT							
+	271A1	87.	2.25	23.	17.	17.	.09
HYDROGRAPH AT							
+	SCE	132.	1.67	21.	15.	15.	.10
HYDROGRAPH AT							
+	SCW	136.	1.58	16.	12.	12.	.06
2 COMBINED AT							
+	CPSC	263.	1.67	37.	27.	27.	.16
DIVERSION TO							
+	DOSC	263.	2.33	29.	21.	21.	.16
HYDROGRAPH AT							
+	SCRET	84.	2.33	8.	6.	6.	.16
4 COMBINED AT							
+	1I12c	586.	2.33	121.	88.	88.	.84
HYDROGRAPH AT							
+	255A	603.	1.92	139.	100.	100.	.60
HYDROGRAPH AT							
+	D7OUT	130.	2.08	27.	20.	20.	.00
2 COMBINED AT							
+	CP255A	713.	2.00	166.	120.	120.	.60
ROUTED TO							
+	R12B	709.	2.08	166.	120.	120.	.60
+							1013.77
2.08							
HYDROGRAPH AT							
+	12b	119.	1.67	19.	13.	13.	.08
2 COMBINED AT							
+	CP12B	788.	2.00	185.	133.	133.	.68
HYDROGRAPH AT							
+	12C	279.	1.67	40.	28.	28.	.15
2 COMBINED AT							
+	CP12C	980.	1.92	225.	162.	162.	.83
ROUTED TO							
+	SR12C	710.	2.42	227.	171.	171.	.83
+							1010.22
2.42							

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

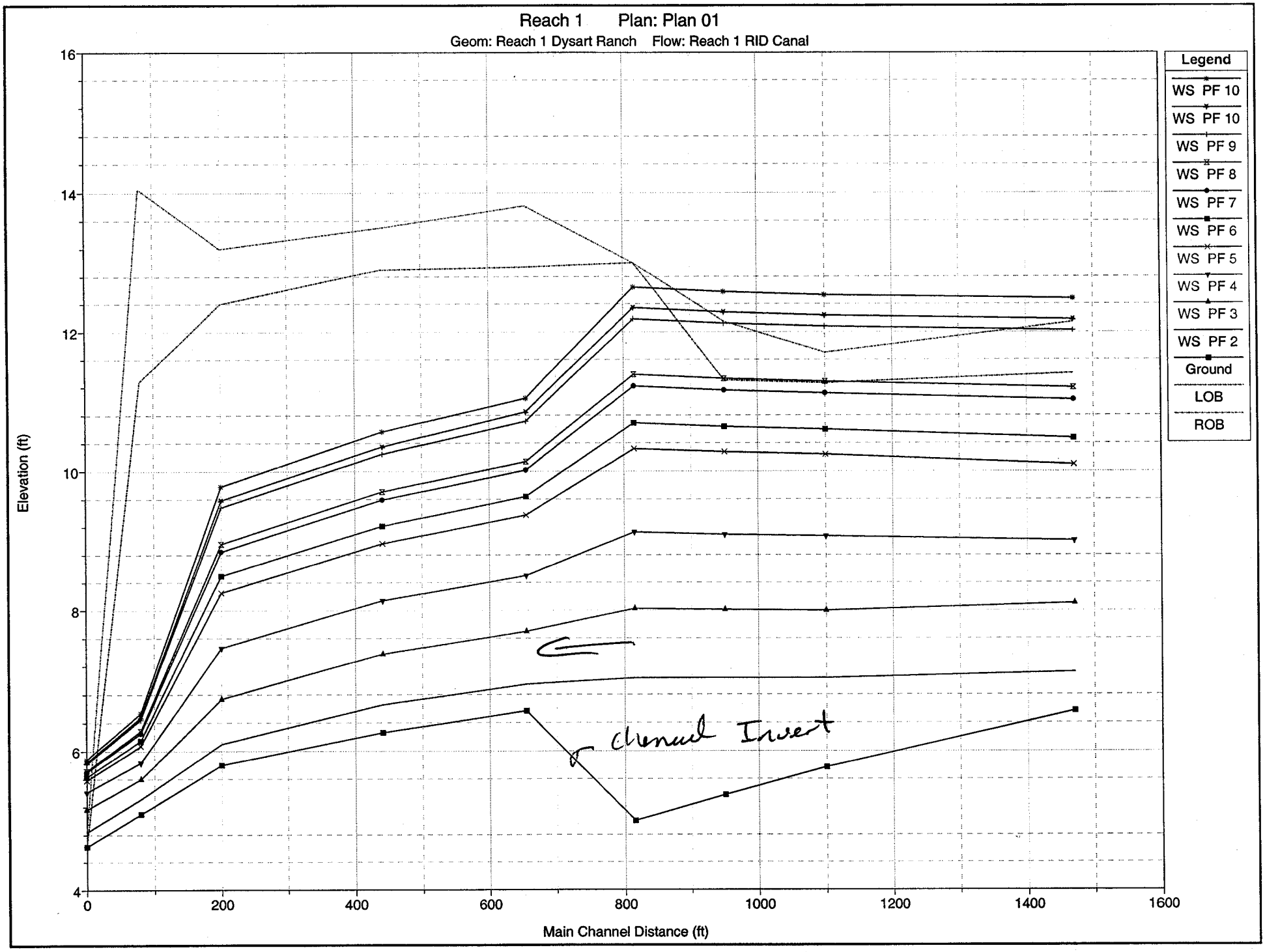
APPENDIX 2.0
HYDRAULIC DATA/HEC-RAS OUTPUT

HEC-RAS Plan: Plan 01 River: RID OVERCHUTE Reach: Reach 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)
Reach 1	1.08	25.00	6.57	7.12	7.12	7.34	0.003299	3.82	6.54	14.63	1.01	370.00
Reach 1	1.08	150.00	6.57	8.10	8.10	8.65	0.002475	5.94	25.25	23.30	1.01	370.00
Reach 1	1.08	360.00	6.57	9.01	9.01	9.82	0.002194	7.23	49.82	31.22	1.01	370.00
Reach 1	1.08	650.00	6.57	10.09	9.85	10.92	0.001479	7.30	89.04	40.80	0.87	370.00
Reach 1	1.08	750.00	6.57	10.47	10.09	11.26	0.001259	7.14	105.07	44.12	0.82	370.00
Reach 1	1.08	900.00	6.57	11.02	10.43	11.76	0.001010	6.89	130.55	48.93	0.74	370.00
Reach 1	1.08	950.00	6.57	11.19	10.53	11.92	0.000947	6.82	139.22	50.47	0.72	370.00
Reach 1	1.08	1200.00	6.57	12.02	11.00	12.69	0.000696	6.55	183.18	55.40	0.63	370.00
Reach 1	1.08	1250.00	6.57	12.18	11.09	12.84	0.000657	6.51	192.05	56.00	0.62	370.00
Reach 1	1.08	1350.00	6.57	12.48	11.24	13.13	0.000587	6.46	208.85	56.00	0.59	370.00
Reach 1	1.07	25.00	5.77	7.03	6.18	7.04	0.000059	0.89	28.08	27.05	0.15	150.00
Reach 1	1.07	150.00	5.77	8.00	6.97	8.10	0.000262	2.61	57.40	33.59	0.35	150.00
Reach 1	1.07	360.00	5.77	9.07	7.78	9.28	0.000340	3.70	97.28	40.83	0.42	150.00
Reach 1	1.07	650.00	5.77	10.24		10.53	0.000334	4.34	149.78	48.75	0.44	150.00
Reach 1	1.07	750.00	5.77	10.59		10.91	0.000327	4.48	167.49	51.14	0.44	150.00
Reach 1	1.07	900.00	5.77	11.11		11.44	0.000310	4.62	194.98	54.65	0.43	150.00
Reach 1	1.07	950.00	5.77	11.28		11.62	0.000304	4.65	204.21	55.70	0.43	150.00
Reach 1	1.07	1200.00	5.77	12.08		12.44	0.000264	4.81	249.32	57.00	0.41	150.00
Reach 1	1.07	1250.00	5.77	12.24		12.60	0.000257	4.84	258.33	57.00	0.40	150.00
Reach 1	1.07	1350.00	5.77	12.53		12.90	0.000246	4.91	275.05	57.00	0.39	150.00
Reach 1	1.06	25.00	5.37	7.03		7.03	0.000019	0.59	42.18	31.57	0.09	135.00
Reach 1	1.06	150.00	5.37	8.01		8.07	0.000121	1.96	76.54	38.53	0.25	135.00
Reach 1	1.06	360.00	5.37	9.09		9.23	0.000186	2.94	122.34	46.20	0.32	135.00
Reach 1	1.06	650.00	5.37	10.27		10.47	0.000203	3.57	181.96	54.59	0.34	135.00
Reach 1	1.06	750.00	5.37	10.63		10.85	0.000202	3.71	202.04	57.14	0.35	135.00
Reach 1	1.06	900.00	5.37	11.16		11.39	0.000198	3.87	232.84	60.84	0.35	135.00
Reach 1	1.06	950.00	5.37	11.32		11.56	0.000196	3.91	243.15	61.95	0.35	135.00
Reach 1	1.06	1200.00	5.37	12.12		12.38	0.000179	4.08	293.93	64.91	0.34	135.00
Reach 1	1.06	1250.00	5.37	12.28		12.55	0.000175	4.11	304.25	65.00	0.33	135.00
Reach 1	1.06	1350.00	5.37	12.58		12.85	0.000168	4.17	323.48	65.00	0.33	135.00
Reach 1	1.05	25.00	5.00	7.03		7.03	0.000008	0.38	66.13	50.78	0.06	160.00
Reach 1	1.05	150.00	5.00	8.02		8.05	0.000045	1.26	119.04	55.65	0.15	160.00
Reach 1	1.05	360.00	5.00	9.13		9.19	0.000070	1.96	183.26	61.04	0.20	160.00
Reach 1	1.05	650.00	5.00	10.32		10.42	0.000082	2.50	259.77	66.89	0.22	160.00
Reach 1	1.05	750.00	5.00	10.69		10.80	0.000083	2.63	284.75	68.69	0.23	160.00
Reach 1	1.05	900.00	5.00	11.21		11.34	0.000084	2.80	321.49	71.26	0.23	160.00
Reach 1	1.05	950.00	5.00	11.38		11.51	0.000084	2.85	333.57	72.09	0.23	160.00
Reach 1	1.05	1200.00	5.00	12.19		12.33	0.000084	3.05	393.06	76.02	0.24	160.00
Reach 1	1.05	1250.00	5.00	12.35		12.49	0.000083	3.08	405.24	76.80	0.24	160.00
Reach 1	1.05	1350.00	5.00	12.64		12.80	0.000083	3.15	428.30	78.26	0.24	160.00
Reach 1	1.04	25.00	6.57	6.94		7.02	0.001466	2.23	11.20	30.00	0.64	215.00
Reach 1	1.04	150.00	6.57	7.70		8.00	0.001407	4.43	33.87	30.00	0.73	215.00
Reach 1	1.04	360.00	6.57	8.50		9.10	0.001444	6.21	57.94	30.00	0.79	215.00
Reach 1	1.04	650.00	6.57	9.37		10.30	0.001459	7.74	84.01	30.00	0.81	215.00
Reach 1	1.04	750.00	6.57	9.64		10.67	0.001464	8.15	91.99	30.00	0.82	215.00
Reach 1	1.04	900.00	6.57	10.02		11.19	0.001469	8.71	103.37	30.00	0.83	215.00
Reach 1	1.04	950.00	6.57	10.14		11.36	0.001471	8.88	107.01	30.00	0.83	215.00
Reach 1	1.04	1200.00	6.57	10.71		12.16	0.001484	9.65	124.31	30.00	0.84	215.00
Reach 1	1.04	1250.00	6.57	10.85		12.32	0.001460	9.74	128.36	30.00	0.83	215.00
Reach 1	1.04	1350.00	6.57	11.04		12.61	0.001490	10.06	134.16	30.00	0.84	215.00
Reach 1	1.03	25.00	6.26	6.65		6.72	0.001218	2.11	11.85	30.00	0.59	240.00
Reach 1	1.03	150.00	6.26	7.37		7.69	0.001471	4.49	33.41	30.00	0.75	240.00
Reach 1	1.03	360.00	6.26	8.14	7.90	8.77	0.001570	6.38	56.44	30.00	0.82	240.00
Reach 1	1.03	650.00	6.26	8.96	8.70	9.96	0.001632	8.02	81.05	30.00	0.86	240.00
Reach 1	1.03	750.00	6.26	9.21	8.94	10.33	0.001647	8.47	88.57	30.00	0.87	240.00
Reach 1	1.03	900.00	6.26	9.59	9.29	10.85	0.001631	9.01	99.93	30.00	0.87	240.00
Reach 1	1.03	950.00	6.26	9.71	9.40	11.02	0.001634	9.19	103.43	30.00	0.87	240.00
Reach 1	1.03	1200.00	6.26	10.24	9.93	11.81	0.001671	10.04	119.55	30.00	0.89	240.00
Reach 1	1.03	1250.00	6.26	10.35	10.03	11.96	0.001675	10.19	122.70	30.00	0.89	240.00
Reach 1	1.03	1350.00	6.26	10.56	10.24	12.26	0.001674	10.46	129.10	30.00	0.89	240.00
Reach 1	1.02	25.00	5.80	6.10	6.10	6.24	0.003912	3.00	8.33	30.00	1.00	120.00
Reach 1	1.02	150.00	5.80	6.74	6.74	7.20	0.002783	5.46	27.47	30.00	1.01	120.00
Reach 1	1.02	360.00	5.80	7.46	7.46	8.29	0.002431	7.31	49.24	30.00	1.01	120.00
Reach 1	1.02	650.00	5.80	8.25	8.25	9.48	0.002264	8.90	73.05	30.00	1.00	120.00
Reach 1	1.02	750.00	5.80	8.50	8.50	9.85	0.002235	9.33	80.35	30.00	1.01	120.00
Reach 1	1.02	900.00	5.80	8.84	8.84	10.37	0.002203	9.92	90.73	30.00	1.01	120.00

HEC-RAS Plan: Plan 01 River: RID OVERCHUTE Reach: Reach 1 (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)
Reach 1	1.02	950.00	5.80	8.96	8.96	10.54	0.002195	10.10	94.06	30.00	1.01	120.00
Reach 1	1.02	1200.00	5.80	9.48	9.48	11.33	0.002165	10.92	109.90	30.00	1.01	120.00
Reach 1	1.02	1250.00	5.80	9.58	9.58	11.49	0.002161	11.07	112.93	30.00	1.01	120.00
Reach 1	1.02	1350.00	5.80	9.78	9.78	11.79	0.002155	11.36	118.88	30.00	1.01	120.00
Reach 1	1.01	25.00	5.10	5.31	5.38	5.52	0.010009	3.64	6.86	37.96	1.51	80.00
Reach 1	1.01	150.00	5.10	5.60	5.86	6.48	0.016609	7.54	19.89	53.78	2.19	80.00
Reach 1	1.01	360.00	5.10	5.84	6.29	7.56	0.020328	10.53	34.18	65.01	2.56	80.00
Reach 1	1.01	650.00	5.10	6.07	6.76	8.75	0.019423	13.12	49.53	65.05	2.65	80.00
Reach 1	1.01	750.00	5.10	6.15	6.91	9.10	0.018961	13.78	54.42	65.06	2.66	80.00
Reach 1	1.01	900.00	5.10	6.25	7.11	9.61	0.018561	14.71	61.17	65.08	2.67	80.00
Reach 1	1.01	950.00	5.10	6.28	7.18	9.77	0.018407	14.99	63.38	65.09	2.68	80.00
Reach 1	1.01	1200.00	5.10	6.45	7.50	10.54	0.017737	16.24	73.87	65.12	2.69	80.00
Reach 1	1.01	1250.00	5.10	6.48	7.56	10.69	0.017621	16.47	75.88	65.12	2.69	80.00
Reach 1	1.01	1350.00	5.10	6.54	7.67	10.98	0.017402	16.91	79.82	65.13	2.69	80.00
Reach 1	1.0	25.00	4.63	4.84	4.84	4.91	0.012454	2.13	11.81	79.55	0.97	
Reach 1	1.0	150.00	4.63	5.16	5.16	5.39	0.008871	3.86	39.39	87.89	0.99	
Reach 1	1.0	360.00	4.63	5.41	5.52	5.96	0.012314	6.01	60.71	92.59	1.25	
Reach 1	1.0	650.00	4.63	5.58	5.91	6.74	0.019407	8.69	75.61	95.87	1.63	
Reach 1	1.0	750.00	4.63	5.63	6.03	7.01	0.021604	9.50	79.81	96.80	1.73	
Reach 1	1.0	900.00	4.63	5.70	6.20	7.42	0.024501	10.61	85.76	98.11	1.86	
Reach 1	1.0	950.00	4.63	5.72	6.26	7.56	0.025555	10.97	87.48	98.49	1.91	
Reach 1	1.0	1200.00	4.63	5.82	6.51	8.24	0.029588	12.58	96.35	100.44	2.09	
Reach 1	1.0	1250.00	4.63	5.84	6.57	8.37	0.030281	12.87	98.06	100.82	2.12	
Reach 1	1.0	1350.00	4.63	5.88	6.66	8.64	0.031506	13.43	101.49	101.58	2.17	


Reach 1 Plan: Plan 01
Geom: Reach 1 Dysart Ranch Flow: Reach 1 RID Canal
Legend
WS PF 10
WS PF 10
WS PF 9
WS PF 8
WS PF 7
WS PF 6
WS PF 5
WS PF 4
WS PF 3
WS PF 2
Ground
LOB
ROB
Elevation (ft)
Main Channel Distance (ft)
16
14
12
10
8
6
4
0
200
400
600
800
1000
1200
1400
1600
Channel Invert

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Reach 1
Project File : dysart_01.prj
Run Date and Time: 6/10/2002 1:28:01 PM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : q:\302005\HECRAS DYSART\Reach 1\dysart_01.p01

Geometry Title: Reach 1 Dysart Ranch
Geometry File : q:\302005\HECRAS DYSART\Reach 1\dysart_01.g01

Flow Title : Reach 1 RID Canal
Flow File : q:\302005\HECRAS DYSART\Reach 1\dysart_01.f01

Plan Summary Information:

Number of:	Cross Sections	= 9	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Reach 1 RID Canal
Flow File : q:\302005\HECRAS DYSART\Reach 1\dysart_01.f01

Flow Data (cfs)

River	Reach	RS	PF 2	PF 3	PF 4	PF 5	PF 6	PF 7	PF 8	PF 9
RID OVERCHUTE	Reach 1	1.08	25	150	360	650	750	900	950	1200

River	Reach	RS	PF 10	PF 10
RID OVERCHUTE	Reach 1	1.08	1250	1350

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
RID OVERCHUTE	Reach 1	PF 2	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 3	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 4	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 5	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 6	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 7	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 8	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 9	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 10	Normal S = .001	Critical
RID OVERCHUTE	Reach 1	PF 10	Normal S = .001	Critical

GEOMETRY DATA

Geometry Title: Reach 1 Dysart Ranch
Geometry File : q:\302005\HECRAS DYSART\Reach 1\dysart_01.g01

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.08

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
76	11.4	94	6.62	100	6.57	104	6.57	132	12.14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
76	.013	76	.013	132	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76	132	370	370	370	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.07

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	11.26	90	5.8	100	5.77	109	5.88	127	11.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70	.013	70	.013	127	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	127	150	150	150	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.06

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65	11.3	85	5.43	100	5.37	105	5.37	130	12.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
65	.013	65	.013	130	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	130	140	135	135	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.05

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	13	62	5.9	100	5.5	105	5	125	13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.013	45	.013	125	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
45	125	165	160	160	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.04

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
85	12.94	85	6.57	100	6.57	115	6.57	115	13.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
85	.013	85	.013	115	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
85	115	215	215	215	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.03

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
85	12.9	85	6.26	100	6.26	115	6.26	115	13.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
85	.013	85	.013	115	.013

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr. Expan.	
85	115	240	240	240	.1 .3

CROSS SECTION RIVER: RID OVERCHUTE
REACH: Reach 1 RS: 1.02

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
85	12.4	85	5.8	100	5.84	115	5.8	115	13.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
85	.013	85	.013	115	.013

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
            85     115              135     120      95             .1       .3

CROSS SECTION           RIVER: RID OVERCHUTE
REACH: Reach 1             RS: 1.01

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      60   11.28      61     5.8     100     5.1     126     5.1     126   14.05

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
      60    .013       60    .013      126    .013

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
            60     126              105      80      35             .1       .3

CROSS SECTION           RIVER: RID OVERCHUTE
REACH: Reach 1             RS: 1.0

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -25    13.4      60    4.66     100    4.63     140    4.85     220    13.3

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -25    .022       60    .022      140    .022

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
            60     140                0       0       0             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
-888       F
888       F


SUMMARY OF MANNING'S N VALUES

River:RID OVERCHUTE

      Reach          River Sta.       n1        n2        n3

 Reach 1              1.08             .013      .013      .013
 Reach 1              1.07             .013      .013      .013
 Reach 1              1.06             .013      .013      .013
 Reach 1              1.05             .013      .013      .013
 Reach 1              1.04             .013      .013      .013
 Reach 1              1.03             .013      .013      .013
```

Reach 1	1.02	.013	.013	.013
Reach 1	1.01	.013	.013	.013
Reach 1	1.0	.022	.022	.022

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: RID OVERCHUTE

Reach	River Sta.	Contr.	Expan.
Reach 1	1.08	.1	.3
Reach 1	1.07	.1	.3
Reach 1	1.06	.1	.3
Reach 1	1.05	.1	.3
Reach 1	1.04	.1	.3
Reach 1	1.03	.1	.3
Reach 1	1.02	.1	.3
Reach 1	1.01	.1	.3
Reach 1	1.0	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 01

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 2
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 3
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 4

Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 5

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 6

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 7

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 8

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 9

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 10

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.08 Profile: PF 10

Warning:The cross-section end points had to be extended vertically for the computed water surface.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 2

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 3

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 4
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 8
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 9
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 10
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.07 Profile: PF 10
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 2
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 3
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 4
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 5
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 6
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 7
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 8
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 9
Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 10

Warning:The cross-section end points had to be extended vertically for the computed water surface.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.06 Profile: PF 10
Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 2
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 3
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 4
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 5
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 6
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 7
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 8
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 9
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.

This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.05 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.03 Profile: PF 2
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 2
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water
surface that had the least amount of error between computed and assumed values.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 3
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 4
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 5
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.

River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 6
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 7
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 8
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 9
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 10

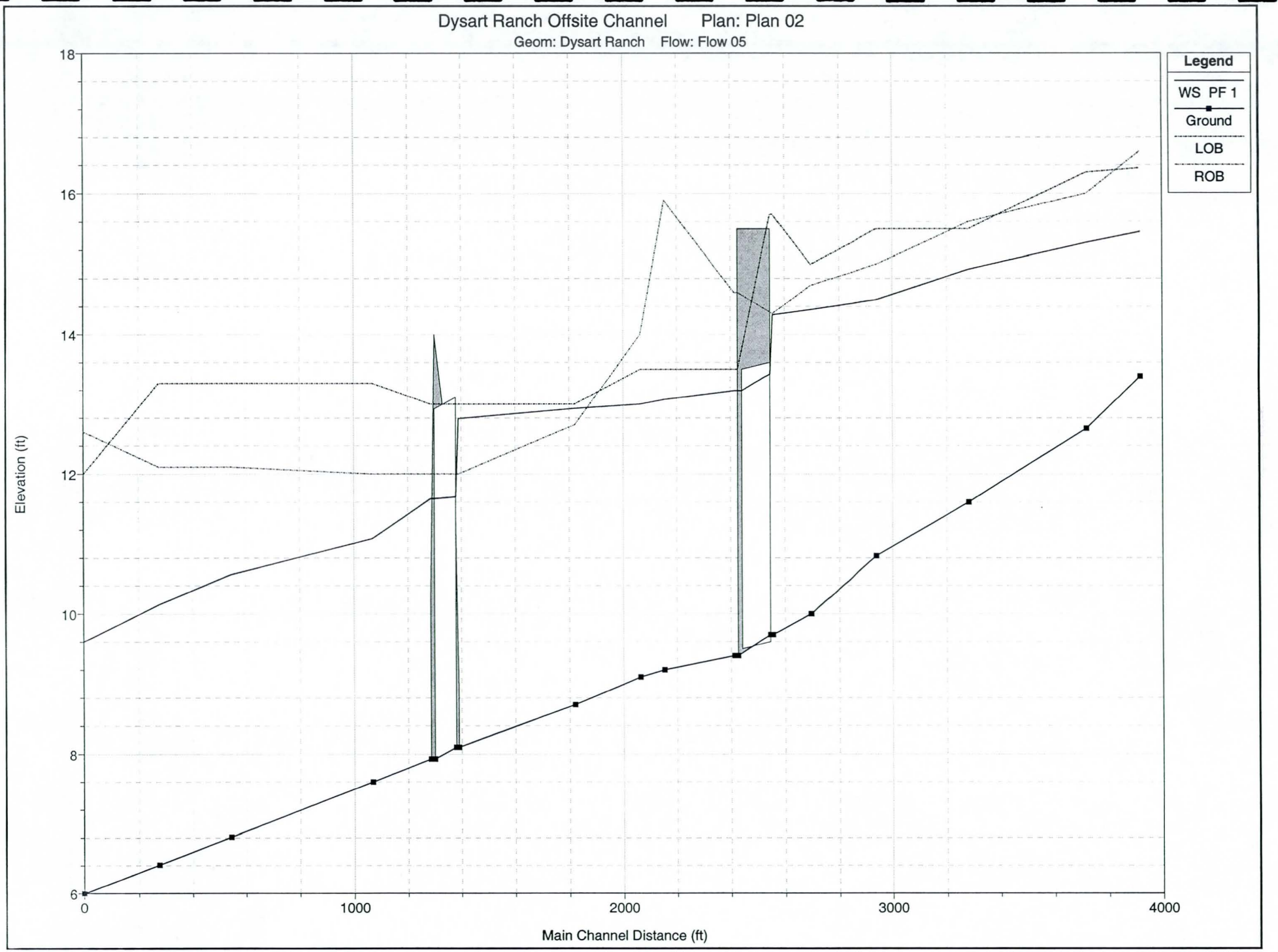
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.02 Profile: PF 10
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The
program defaulted to critical depth.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 2
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 3
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 4
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 5
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 6
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 7
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 8
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 9
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.01 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 2
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was
used.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 4
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 5
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate
the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 6

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 7
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 8
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 9
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: RID OVERCHUTE Reach: Reach 1 RS: 1.0 Profile: PF 10
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

HEC-RAS Plan: Plan 02 River: Dysart/RID Reach: Reach 2 Profile: PF 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 2	2.15	350.00	13.40	15.46	15.46	16.15	0.010467	6.70	52.27	37.83	1.00
Reach 2	2.14	350.00	12.65	15.31		15.40	0.000456	2.42	144.57	65.82	0.29
Reach 2	2.13	350.00	11.60	14.93		15.09	0.001194	3.20	109.51	46.80	0.37
Reach 2	2.12	350.00	10.83	14.50		14.67	0.001251	3.34	104.65	43.08	0.38
Reach 2	2.11	394.00	10.00	14.36		14.46	0.000562	2.52	156.15	53.96	0.26
Reach 2	2.10	394.00	9.70	14.28	12.05	14.39	0.000392	2.66	148.02	51.63	0.28
Reach 2	2.095	Culvert									
Reach 2	2.09	394.00	9.40	13.19		13.30	0.000413	2.65	148.44	54.30	0.28
Reach 2	2.08	394.00	9.20	13.07		13.18	0.000458	2.77	142.05	52.50	0.30
Reach 2	2.07	611.00	9.10	13.00		13.15	0.000525	3.05	200.42	71.75	0.32
Reach 2	2.06	611.00	8.70	12.94		13.01	0.000412	2.20	278.04	94.56	0.23
Reach 2	2.05	611.00	8.10	12.79	10.09	12.85	0.000319	2.04	299.53	93.50	0.20
Reach 2	2.045	Culvert									
Reach 2	2.04	611.00	7.93	11.65		11.83	0.001168	3.43	178.24	67.88	0.37
Reach 2	2.03	611.00	7.60	11.07		11.43	0.002399	4.77	128.22	50.80	0.53
Reach 2	2.02	611.00	6.81	10.56		10.70	0.000781	3.01	202.93	69.21	0.31
Reach 2	2.01	611.00	6.41	10.13		10.40	0.001627	4.12	148.46	54.77	0.44
Reach 2	2.0	611.00	6.00	9.60	8.53	9.96	0.001502	4.78	127.84	50.98	0.53


Dysart Ranch Offsite Channel Plan: Plan 02
Geom: Dysart Ranch Flow: Flow 05
Legend
WS PF 1
Ground
LOB
ROB
Elevation (ft)
18
16
14
12
10
8
6
0
1000
2000
3000
4000
Main Channel Distance (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Dysart Ranch Offsite Channel
Project File : Reach02.prj
Run Date and Time: 6/12/2002 7:47:19 AM

Project in English units

Project Description:
& RHydraulic Analysis for the the revised Dysart Road Channel

EEC Job Number
302005
Date June 7, 2002

The channel will include adding a set of box
culverts at the new Osborn Road Crossing and revising the east bank along
Dysart Ranch.

Project Engineer : mjr

PLAN DATA

Plan Title: Plan 02
Plan File : q:\302005\HECRAS DYSART\Reach02.p02

Geometry Title: Dysart Ranch
Geometry File : q:\302005\HECRAS DYSART\Reach02.g01

Flow Title : Flow 05
Flow File : q:\302005\HECRAS DYSART\Reach02.f05

Plan Summary Information:
Number of: Cross Sections = 16 Mulitple Openings = 0
Culverts = 2 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Flow 05
Flow File : q:\302005\HECRAS DYSART\Reach02.f05

Flow Data (cfs)

Dysart/RID	Reach 2	2.15	350
Dysart/RID	Reach 2	2.11	394
Dysart/RID	Reach 2	2.07	611

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Dysart/RID	Reach 2	PF 1		Normal S = .0015

GEOMETRY DATA

Geometry Title: Dysart Ranch
Geometry File : q:\302005\HECRAS DYSART\Reach02.g01

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.15

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74	16.36	94	13.4	100	13.4	107	13.4	124	16.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
74	.028	74	.028	124	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	124	200	200	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.14

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
62	16.3	77	12.65	100	12.65	120	12.65	135	16

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
62	.028	62	.022	135	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62	135	437	437	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.13

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	15.5	86	11.6	100	11.6	105	11.6	122	15.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70	.028	70	.028	122	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	122	342	342	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.12

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	15.5	93	10.83	100	10.83	107	10.83	124	15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75	.028	75	.028	124	.028

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
            75     124              243     243     243             .1       .3

CROSS SECTION          RIVER: Dysart/RID
REACH: Reach 2         RS: 2.11

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      69      15      89      10     100   10.03     107   10.03     127    14.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      69    .028      69    .028     127    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
            69     127              140     140     140             .1       .3

CROSS SECTION          RIVER: Dysart/RID
REACH: Reach 2         RS: 2.10

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      70    15.7      94     9.7     100     9.7     107     9.7   127.4    14.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      70    .028      70    .022   127.4    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
            70   127.4              143     143     143             .3       .5

CULVERT                RIVER: Dysart/RID
REACH: Reach 2         RS: 2.095

INPUT
Description:
Distance from Upstream XS =       10
Deck/Roadway Width        =      120
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      60    15.5     8.5     150    15.5     8.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      70    15.7      94     9.7     100     9.7     107     9.7   127.4    14.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      70    .028      70    .022   127.4    .028

Bank Sta: Left   Right    Coeff Contr.    Expan.
            70   127.4             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      60    15.5     8.5     150    15.5     8.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      67    13.5      84     9.4     100     9.4     108     9.4     128    14.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      67    .028      67    .022     128    .028

Bank Sta: Left   Right    Coeff Contr.    Expan.
            67     128             .3       .5

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
```

Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	4	8

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
10	105	.015	.5	1

Number of Barrels = 2
Upstream Elevation = 9.6
Centerline Stations

Sta.	Sta.
95	104

Downstream Elevation = 9.5
Centerline Stations

Sta.	Sta.
95	104

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.09

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	13.5	84	9.4	100	9.4	108	9.4	128	14.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
67	.028	67	.022	128	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	128	259.98	259.98 259.98	.3	.5

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.08

INPUT
Description: section is in a curve with a 60 foot radious
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	13.5	89	9.2	100	9.2	110	9.2	135	15.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70	.028	70	.022	135	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	135	90	90	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.07

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	13.5	85	9.1	100	9.1	116	9.1	136	14

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57	.028	57	.022	136	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	136	243	243 243	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.06

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	13	85	8.7	100	8.7	120	8.7	150	12.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
55	.028	55	.028	150	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	150	430	430 430	.1	.3

```
CROSS SECTION          RIVER: Dysart/RID
REACH: Reach 2            RS: 2.05

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      50      13      85     8.1     100     8.1     114     8.1     145      12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      50    .028      50    .028     145    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           50     145             105     105     105             .3       .5

CULVERT                RIVER: Dysart/RID
REACH: Reach 2            RS: 2.045

INPUT
Description:
Distance from Upstream XS =      10
Deck/Roadway Width        =      80
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      45      14     7.5     140      14     7.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      50      13      85     8.1     100     8.1     114     8.1     145      12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      50    .028      50    .028     145    .028

Bank Sta: Left   Right    Coeff Contr.   Expan.
           50     145             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      45      14     7.5     140      14     7.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      64      13      86    7.93     100    7.93     114    7.93     140      12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
      64    .028      64    .028     140    .028

Bank Sta: Left   Right    Coeff Contr.   Expan.
           64     140             .3       .5

Upstream Embankment side slope              =       4 horiz. to 1.0 vertical
Downstream Embankment side slope            =       4 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       5      12
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  10      80       .012                   .5                1
Number of Barrels =  2
Upstream   Elevation =  8.1
Centerline Stations
    Sta.    Sta.
      92     105
Downstream Elevation =  7.93
Centerline Stations
    Sta.    Sta.
```

92 105

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.04

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
64	13	86	7.93	100	7.93	114	7.93	140	12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
64	.028	64	.028	140	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
64	140	217	217	.3	.5

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.03

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
64.2	13.3	87	7.6	100	7.6	110	7.6	127.6	12

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
64.2	.028	64.2	.028	127.6	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
64.2	127.6	523.05	523.05	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.02

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	13.3	80.5	6.81	100	6.81	119.5	6.81	140.5	12.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.028	54	.028	140.5	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	140.5	270	270	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.01

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	13.3	87.5	6.41	100	6.41	112.5	6.41	135.3	12.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60	.028	60	.028	135.3	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	135.3	275.03	275.03	.1	.3

CROSS SECTION RIVER: Dysart/RID
REACH: Reach 2 RS: 2.0

INPUT
Description: Section will include gunite bank protection
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
62.4	12	90	6	100	6	110	6	136.4	12.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
62.4	.028	62.4	.022	136.4	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62.4	136.4	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Dysart/RID

Reach	River Sta.	n1	n2	n3
Reach 2	2.15	.028	.028	.028
Reach 2	2.14	.028	.022	.028
Reach 2	2.13	.028	.028	.028
Reach 2	2.12	.028	.028	.028
Reach 2	2.11	.028	.028	.028
Reach 2	2.10	.028	.022	.028
Reach 2	2.095	Culvert		
Reach 2	2.09	.028	.022	.028
Reach 2	2.08	.028	.022	.028
Reach 2	2.07	.028	.022	.028
Reach 2	2.06	.028	.028	.028
Reach 2	2.05	.028	.028	.028
Reach 2	2.045	Culvert		
Reach 2	2.04	.028	.028	.028
Reach 2	2.03	.028	.028	.028
Reach 2	2.02	.028	.028	.028
Reach 2	2.01	.028	.028	.028
Reach 2	2.0	.028	.022	.028

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Dysart/RID

Reach	River Sta.	Contr.	Expan.
Reach 2	2.15	.1	.3
Reach 2	2.14	.1	.3
Reach 2	2.13	.1	.3
Reach 2	2.12	.1	.3
Reach 2	2.11	.1	.3
Reach 2	2.10	.3	.5
Reach 2	2.095	Culvert	
Reach 2	2.09	.3	.5
Reach 2	2.08	.1	.3
Reach 2	2.07	.1	.3
Reach 2	2.06	.1	.3
Reach 2	2.05	.3	.5
Reach 2	2.045	Culvert	
Reach 2	2.04	.3	.5
Reach 2	2.03	.1	.3
Reach 2	2.02	.1	.3
Reach 2	2.01	.1	.3
Reach 2	2.0	.1	.3

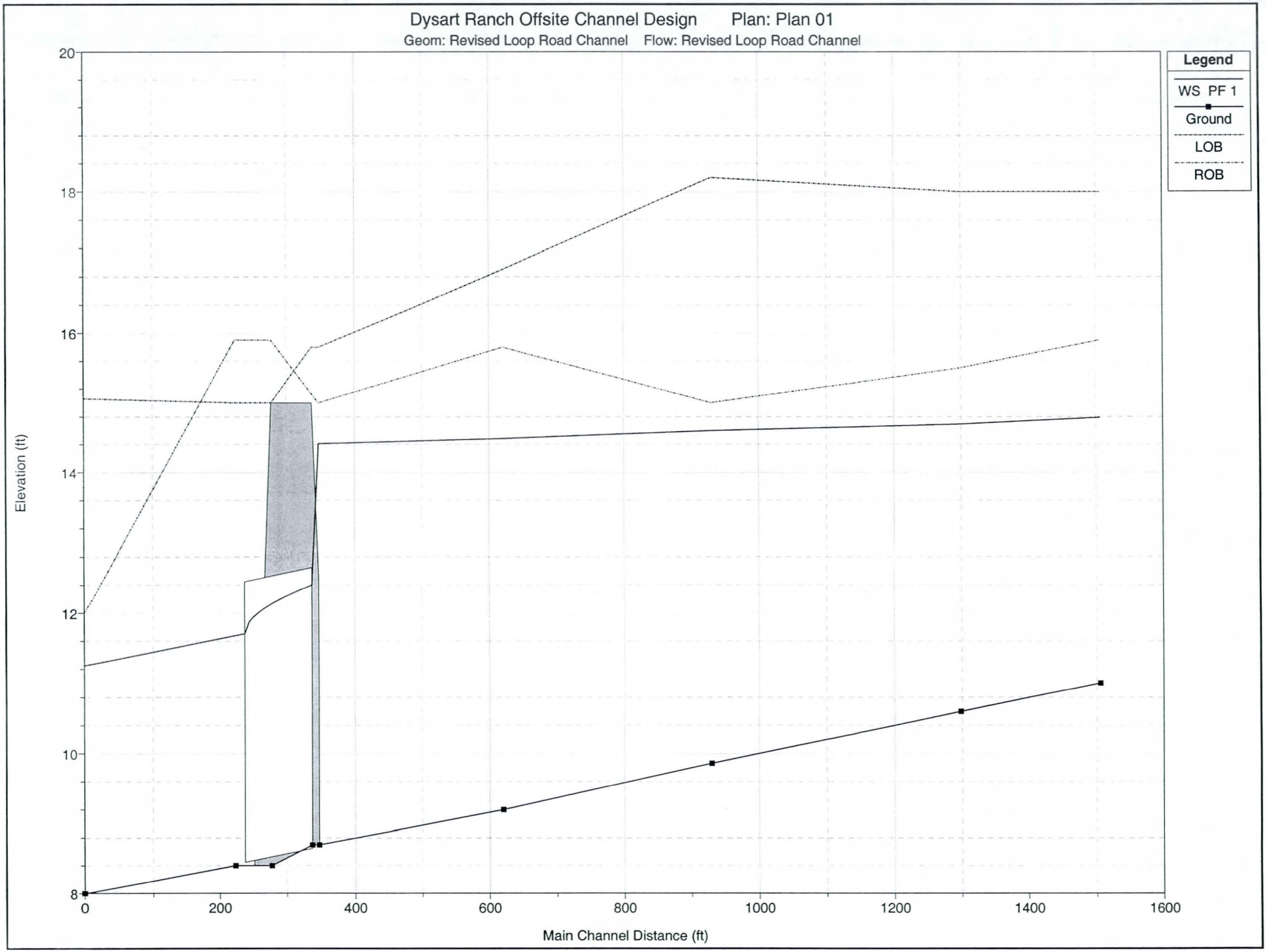
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 02

River: Dysart/RID Reach: Reach 2 RS: 2.15 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
River: Dysart/RID Reach: Reach 2 RS: 2.14 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Dysart/RID Reach: Reach 2 RS: 2.12 Profile: PF 1
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Dysart/RID Reach: Reach 2 RS: 2.095 Profile: PF 1 Culv: Culvert #1
Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height

of the culvert.
River: Dysart/RID Reach: Reach 2   RS: 2.08   Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
          This may indicate the need for additional cross sections.
River: Dysart/RID Reach: Reach 2   RS: 2.06   Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: Dysart/RID Reach: Reach 2   RS: 2.04   Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
          This may indicate the need for additional cross sections.
River: Dysart/RID Reach: Reach 2   RS: 2.03   Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
          This may indicate the need for additional cross sections.
River: Dysart/RID Reach: Reach 2   RS: 2.02   Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
          This may indicate the need for additional cross sections.

HEC-RAS Plan: Plan 01 River: Loop Road Reach: Reach 3 Profile: PF 1

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl	Length Chnl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		(ft)
Reach 3	3.6	713.00	11.00	14.79		14.92	0.000719	2.97	240.23	78.84	0.30	207.00
Reach 3	3.5	713.00	10.60	14.69		14.79	0.000481	2.57	277.52	83.63	0.25	369.00
Reach 3	3.4	713.00	9.86	14.60		14.66	0.000243	1.98	359.71	95.82	0.18	309.00
Reach 3	3.3	799.00	9.20	14.48		14.57	0.000320	2.36	338.75	85.21	0.21	273.00
Reach 3	3.2	799.00	8.70	14.41	10.85	14.49	0.000267	2.23	358.46	85.51	0.19	124.50
Reach 3	3.15	Culvert										
Reach 3	3.1	799.00	8.40	11.68		11.82	0.000812	3.00	266.30	94.52	0.32	223.00
Reach 3	3.0	799.00	8.00	11.25	10.07	11.51	0.002000	4.09	195.32	85.79	0.48	


Dysart Ranch Offsite Channel Design Plan: Plan 01
Geom: Revised Loop Road Channel Flow: Revised Loop Road Channel
Legend
WS PF 1
Ground
LOB
ROB
Elevation (ft)
20
18
16
14
12
10
8
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (ft)

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: Dysart Ranch Offsite Channel Design
Project File : dysart_R3.prj
Run Date and Time: 6/9/2002 2:42:41 PM

Project in English units

Project Description:
Hydraulic Analysis for the the revised Loop Road Channel

EEC Job Number
302005
Date June 7, 2002

The channel will include adding a set of box
culverts at the new Osborn Road Crossing and revising the east bank along
Dysart Ranch.

Project Engineer : mjr

PLAN DATA

Plan Title: Plan 01
Plan File : q:\302005\HECRAS DYSART\Reach3\dysart_R3.p01

Geometry Title: Revised Loop Road Channel
Geometry File : q:\302005\HECRAS DYSART\Reach3\dysart_R3.g01

Flow Title : Revised Loop Road Channel
Flow File : q:\302005\HECRAS DYSART\Reach3\dysart_R3.f01

Plan Summary Information:
Number of: Cross Sections = 7 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculaton tolerance = 0.003
Maximum number of interations = 20
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Revised Loop Road Channel
Flow File : q:\302005\HECRAS DYSART\Reach3\dysart_R3.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Loop Road	Reach 3	3.6	713
Loop Road	Reach 3	3.3	799

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Loop Road	Reach 3	PF 1		Normal S = .002

GEOMETRY DATA

Geometry Title: Revised Loop Road Channel
Geometry File : q:\302005\HECRAS DYSART\Reach3\dysart_R3.g01

CROSS SECTION RIVER: Loop Road
REACH: Reach 3 RS: 3.6

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	18	77	11	100	11	125	11	146	15.9

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      50    .028       50    .028      146    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
            50     146              207     207     207              .1        .3

CROSS SECTION           RIVER: Loop Road
REACH: Reach 3             RS: 3.5

INPUT
Description:
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      51       18       78     10.6      100     10.6      130     10.6      150     15.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      51    .028       51    .028      150    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
            51     150              369     369     369              .1        .3

CROSS SECTION           RIVER: Loop Road
REACH: Reach 3             RS: 3.4

INPUT
Description:
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      30     18.2       66     9.86      100     9.86      122     9.86      143       15

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      30    .028       30    .028      143    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.
Expan.
            30     143              309     309     309              .1        .3

CROSS SECTION           RIVER: Loop Road
REACH: Reach 3             RS: 3.3

INPUT
Description:
Station Elevation Data     num=        5
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      50     16.9       80      9.2      100      9.2      123      9.2      150     15.8

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      50    .028       50    .028      150    .028
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
           50     150              273     273     273             .1       .3

CROSS SECTION           RIVER: Loop Road
REACH: Reach 3             RS: 3.2

INPUT
Description:
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    49.6    15.8      78     8.7     100     8.7     118     8.7     143      15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    49.6    .028    49.6    .028     143    .028

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.
Expan.
          49.6     143            124.5   124.5   124.5             .3       .5

CULVERT                 RIVER: Loop Road
REACH: Reach 3             RS: 3.15

INPUT
Description:
Distance from Upstream XS =       10
Deck/Roadway Width        =       60
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    49.6    15.8       8     143      15       8

Upstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    49.6    15.8      78     8.7     100     8.7     118     8.7     143      15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    49.6    .028    49.6    .028     143    .028

Bank Sta: Left   Right    Coeff Contr.   Expan.
          49.6     143             .3       .5

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      45      15       8     170    15.9       8

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      45      15      72     8.4     100     8.4     140     8.4     170    15.9

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
45	.028	45	.028	170	.028

Bank Sta: Left	Right	Coeff Contr.	Expan.
45	170	.3	.5

Upstream Embankment side slope = 4 horiz. to 1.0 vertical
Downstream Embankment side slope = 4 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins =
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	4	12

FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
10	100	.015	.5	1

Number of Barrels = 2
Upstream Elevation = 8.65
Centerline Stations

Sta.	Sta.
92	106

Downstream Elevation = 8.45
Centerline Stations

Sta.	Sta.
92	106

CROSS SECTION RIVER: Loop Road
REACH: Reach 3 RS: 3.1

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	15	72	8.4	100	8.4	140	8.4	170	15.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.028	45	.028	170	.028

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	170	223	223	223	.3	.5

CROSS SECTION RIVER: Loop Road
REACH: Reach 3 RS: 3.0

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

45	15.06	82	8	100	8	122	8	142	10.93
147	11	162	12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.028	45	.028	162	.028

Bank Sta: Left	Right	Coeff Contr.	Expan.
45	162	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Loop Road

Reach	River Sta.	n1	n2	n3
Reach 3	3.6	.028	.028	.028
Reach 3	3.5	.028	.028	.028
Reach 3	3.4	.028	.028	.028
Reach 3	3.3	.028	.028	.028
Reach 3	3.2	.028	.028	.028
Reach 3	3.15	Culvert		
Reach 3	3.1	.028	.028	.028
Reach 3	3.0	.028	.028	.028

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Loop Road

Reach	River Sta.	Contr.	Expan.
Reach 3	3.6	.1	.3
Reach 3	3.5	.1	.3
Reach 3	3.4	.1	.3
Reach 3	3.3	.1	.3
Reach 3	3.2	.3	.5
Reach 3	3.15	Culvert	
Reach 3	3.1	.3	.5
Reach 3	3.0	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 01

River: Loop Road Reach: Reach 3 RS: 3.15 Profile: PF 1 Culv: Culvert #1
Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.
River: Loop Road Reach: Reach 3 RS: 3.1 Profile: PF 1

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

APPENDIX 3.0
VOLUME DATA

Existing Storage Basin Volumes

Dysart Ranch

Stage-Storage Table

For HEC-1 Input file: dyrex.24l/6l

Elevation	Area (ft2)	Area (ac)	Inc. Vol. (ac-ft)	Cumm. Vol. (ac-ft)
1006	4674	0.1		
1008	256900	6.5	6.6	6.6
1010	440440	12.8	19.3	25.9
1012	479420	16.5	29.3	55.2

Loop Road Channel

	AREA	AREA	
1009	7530	0.172865014	
1010	32297.5	0.741448577	0.457156795
1011	57065	1.31003214	1.025740358
1012	106600	2.447199265	1.878615702
			3.361512856

Rid Canal Channel

	AREA	AREA	
1008	25680	0.589532	
1009	83884	1.925712	1.257622
1010	112986	2.593802	2.259757
1011	142088	3.261892	2.927847
1012	171190	3.929982	3.595937
			10.04116

Developed Srorage Basin Volumes

Dysart Ranch

Stage-Storage Table

For HEC-1 Input file: dyr.24l/6l

Elevation	Area (ft2)	Area (ac)	Inc. Vol. (ac-ft)	Cumm. Vol. (ac-ft)
1003.5	212800	4.9		
1004	219800	5.0	2.5	2.5
1005	234100	5.4	5.2	7.7
1006	248800	5.7	5.5	13.2
1006.5	320000	7.3	3.3	16.5
1007	320625	7.4	3.3	19.8
1008	392450	9.6	8.5	28.2
1009	416445	11.6	10.6	38.9
1010	440440	12.8	12.2	51.1
1011	459930	14.8	13.8	64.9
1012	479420	16.5	15.6	**80.5**

Loop Road Channel

1009	7530	0.17286501	
1010	32297.5	0.74144858	0.457156795
1011	57065	1.31003214	1.025740358
1012	106600	2.44719927	1.878615702
			3.361512856

Rid Canal Channel

1008	25680	0.589532	
1009	83884	1.925712	1.257622
1010	112986	2.593802	2.259757
1011	142088	3.261892	2.927847
1012	171190	3.929982	3.595937
			10.04116

Project Title Dysert Ranch Project No. 302005 Date

Subject Flood Plain Volume Prepared By MJL Checked By Page

Flood plain Elevation 1013

Elev.	Area (ft^2)	Area (ac)	Volume (ac-ft)
1010	8940	0.21	
1012	49000	1.12	1.33
1013	767,700	17.62	18.74
			20.10 ac-ft

% Volume to be replaced = 20.1 ac-ft

eec

Project Title Dysart Ranch Project No. _____ Date 5/12/02

Subject Retention Volumes Prepared By MJL Checked By _____ Page _____

RID Canal Channal Volume

Bottom Elevation 1008 (actual 07.6±)

H.W Elevation 1012

		Area
Elev.	1008	25,680
	1012	171,190

Volumes Calc.

	Area	Volume
1008	25680	
Interpolated 1009		
1010		
1011		
1012	171,190	

eec

Project Title _____ Project No. _____ Date _____

Subject _____ Prepared By _____ Checked By _____ Page _____

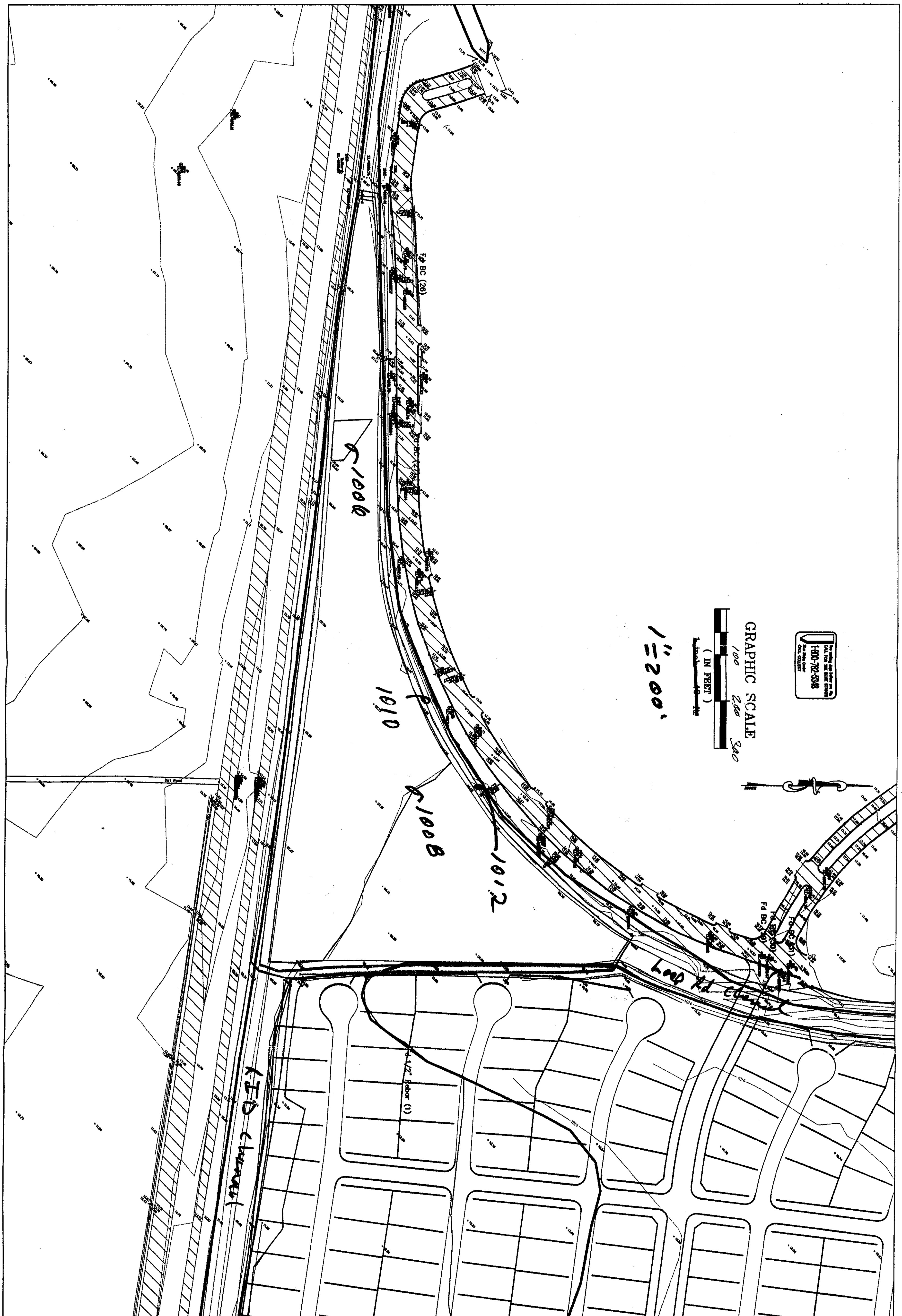
LOOP Road Channel Volume

		Area
Bottom Elevation	1009	7,530
Top Elevation	1012	106,600

Volume Calc.

	1009	7,530
Interpolated	1010	32,300
Interpolated	1011	57,065
	1012	106,600

N:\302005\Volume.dwg, 06/11/2002 07:40:42 PM



DESIGN BY: MJR DRAWN BY: MJR CHK'D BY: DATE: 5/29/02 SCALE: DRAWING NO. 1 of 1	eec Engineering and Environmental Consultants, Inc. 3003 N. Central Avenue, Suite 600 Phoenix, Arizona 85012-2905 TEL:(602)248-7702 FAX:(602)248-7851	SHEET TITLE STORAGE BASIN	**SunCor Development** DYSART RANCH OFFSITE DRAINAGE

REV.	DATE	DESCRIPTION	CK. BY

LEGEND

100 YEAR, 6 HOUR RETENTION PROVIDED (NO RUNOFF DURING 100 YEAR, 6 HOUR STORM)

SUBBASIN BOUNDARY

257 SUBBASIN ID

FLOW PATH

CP12A CONCENTRATION POINTS

GRAPHIC SCALE

0 100 200 400 600

(IN FEET)

1 inch = 400 ft.

DRAINAGE AREA MAP
100 YEAR, 6 HOUR STORM
EXHIBIT
1A

REV.	DATE	DESCRIPTION	CK. BY

SunCor Developemnt Company

Dysart Ranch Subdivision

SHEET TITLE

DRAINAGE AREA MAP

eec
Engineering and Environmental Consultants, Inc.
3003 North Central Ave., Suite 600
Phoenix, Arizona 85012
TEL:(602)248-7702 FAX:(602)248-7851

DESIGN BY: MJR
DRAWN BY: MJR
CHK'D BY:
DATE: 5/5/02
SCALE: Hor. 1"=400'

LEGEND

100 YEAR, 6 HOUR RETENTION PROVIDED (NO RUNOFF DURING 100 YEAR, 6 HOUR STORM)

SUBBASIN BOUNDARY

257 SUBBASIN ID

FLOW PATH

CP12A CONCENTRATION POINTS

GRAPHIC SCALE

0 100 200 400 600

(IN FEET)

1 inch = 400 ft.

DRAINAGE AREA MAP
100 YEAR, 24 HOUR STORM
EXHIBIT
1B

REV.	DATE	DESCRIPTION	CK. BY
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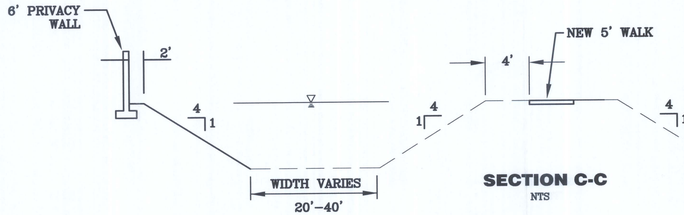
SunCor Developemnt Company

Dysart Ranch Subdivision

SHEET TITLE
DRAINAGE AREA MAP

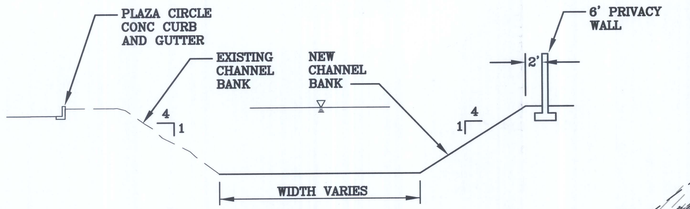
Engineering and Environmental Consultants, Inc.
3003 North Central Ave., Suite 600
Phoenix, Arizona 85012
TEL:(602)248-7702 FAX:(602)248-7851

DESIGN BY: MJR
DRAWN BY: MJR
CHK'D BY:
DATE: 5/5/02
SCALE: Hor. 1"=400'



SECTION C-C
NTS

REACH 2 TYPICAL SECTION



SECTION B-B
NTS

REACH 3 TYPICAL SECTION

LEGEND

350 cfs	100 YEAR–6 HOUR PEAK DISCHARGE
1.01	HEC–RAS CROSS SECTION
····	FLOW PATH
	BANK PROTECTION

HYDRAULIC
HEC–RAS EXHIBIT 2

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DYSART RANCH OFFSITE DRAINAGE

SHEET TITLE: HYDRAULIC HEC–RAS EXHIBIT 3

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DATE:	6/11/02
SCALE:	
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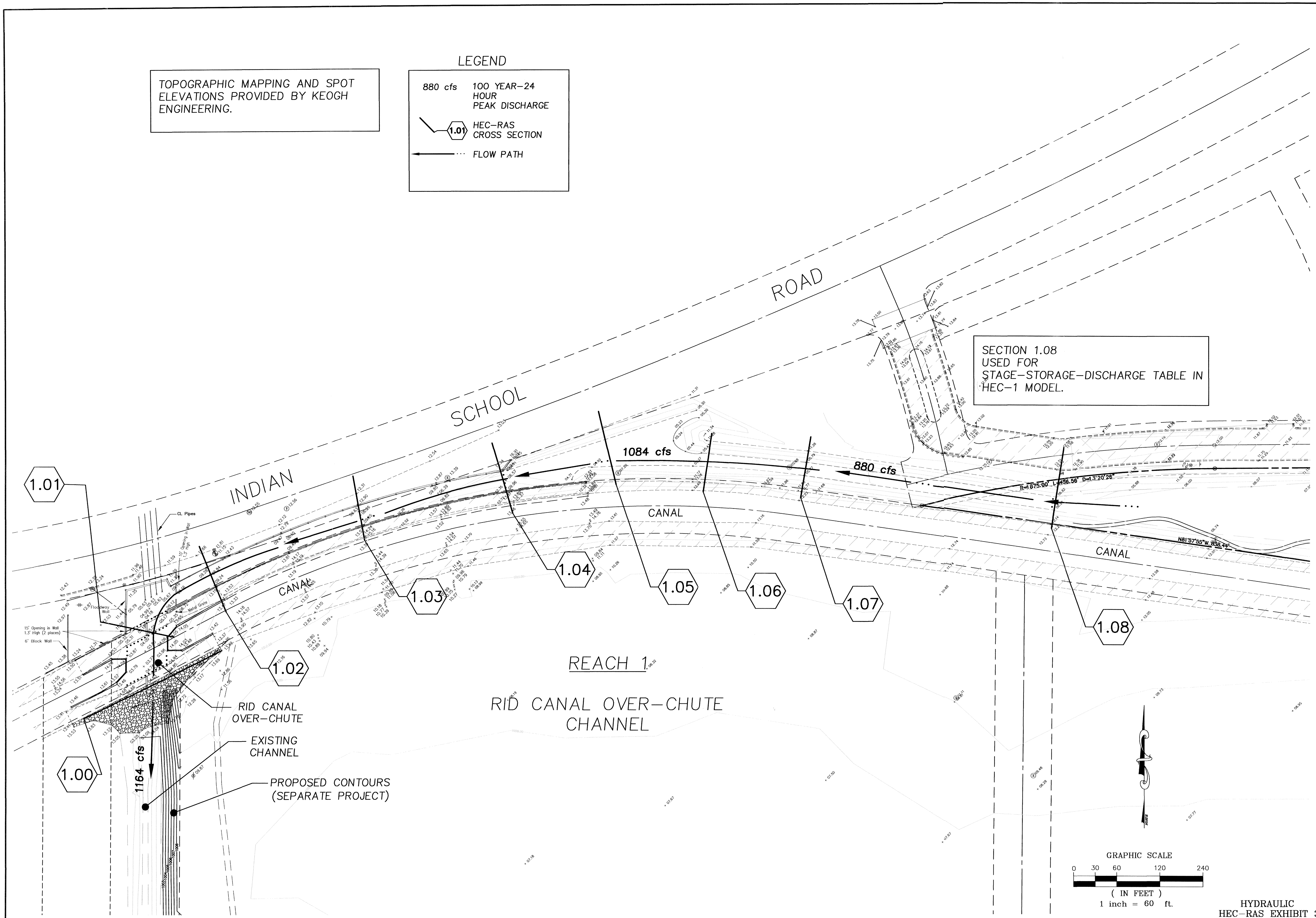

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SunCor Development

DYSART RANCH OFFSITE DRAINAGE

SHEET TITLE

HYDRAULIC HEC-RAS EXHIBIT 4

Engineering and Environmental Consultants, Inc.
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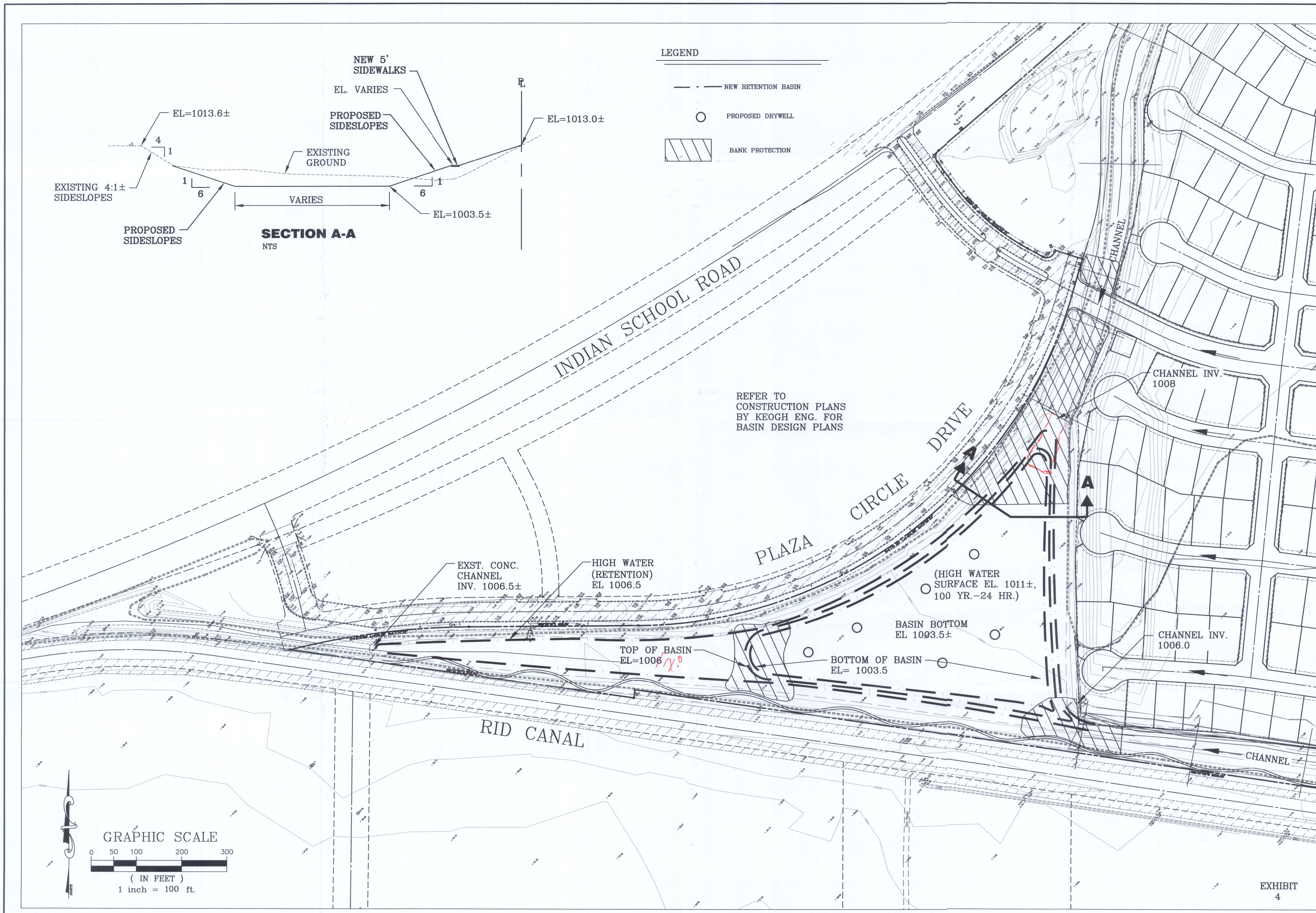
DATE: 6/10/02
SCALE:
DRAWING NO. 1 of 1



REV.	DATE	DESCRIPTION	CK. BY

SunCor Development

DYSART RANCH OFFSITE DRAINAGE

SHEET TITLE

RETENTION BASIN EXHIBIT

aec
Engineering and Environmental Consultants, Inc.
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EXHIBIT
4

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DATE: 5/20/02
SCALE: Hor. 1"=100
DRAWING NO.