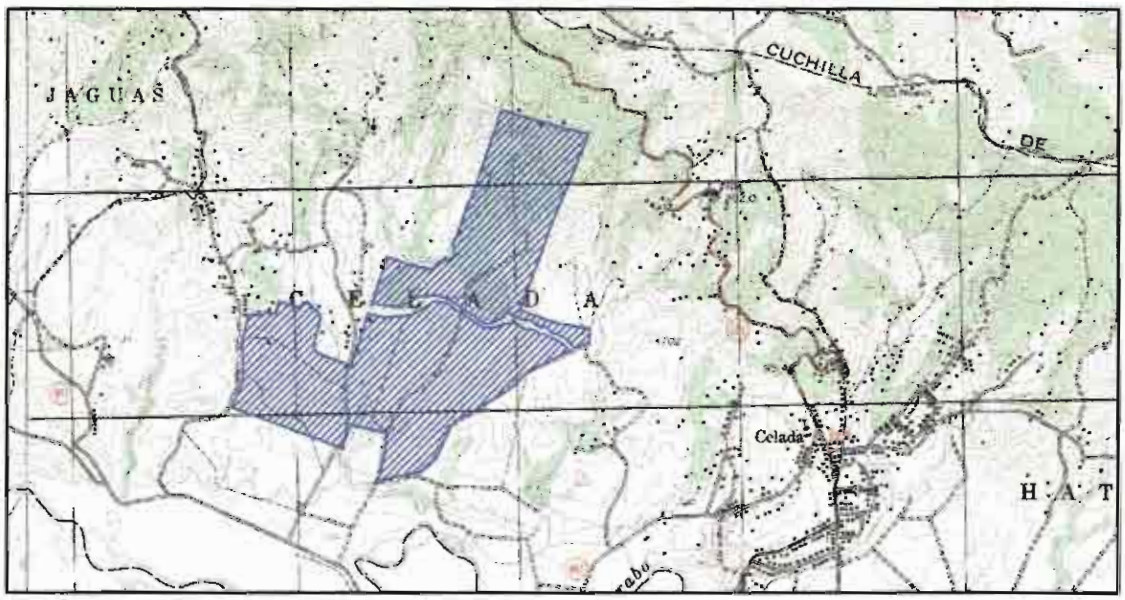
SUNDIAL INVESTMENT, INC.
SAN JUAN, PUERTO RICO

HYDROLOGIC-HYDRAULIC STUDY FOR PALACIOS DE GURABO GURABO, PUERTO RICO



JULY, 2005

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HYDROLOGIC-HYDRAULIC STUDY
FOR PALACIOS DE GURABO
GURABO, PUERTO RICO

Casiano Ancalle, P.E.

July, 2005

I. INTRODUCTION

A housing development project named Palacios de Gurabo is to be constructed in the Municipality of Gurabo. The site can be accessed through PR-9945 derived from road PR-943. The project consists on about 1,000 housing units, recreational facilities, and green areas.

According to the regulatory flood maps the area of the project is actually non-floodable for a 100-year flood from Río Gurabo. Two storm watercourses run across the site. The development will affect none of these areas, both will be kept natural, except for an access road across one of the watercourses.

Runoff from the project site drains towards the south through the existing storm watercourse. The development of the site is going to increase runoff. This increase has to be mitigated according to the prescriptions of the Puerto Rico Planning Board Regulation No. 3.

Purpose of Study

The purpose of the study is to determine the flood levels and footprint for the creeks crossing the site at the segment of the project area, and to size the creek crossing structure needed for the access road. In addition, as the development of the site will increase the runoff discharge, the study will quantify the increase and provide means for mitigating it according to the Puerto Rico's Planning Board Regulation No. 3.

Approach

The following steps have been undertaken throughout the study:

Hydrologic Analysis: The following parameters were determined for the hydrologic analysis: drainage areas, average soil curve number and runoff lag time. Based on these parameters, discharge for 100-years frequency storm was determined for existing and proposed condition. HEC-1 model was used. Discharges for more recurrent storm events such as: 2-, 10-, 25- and 50-years, were also determined.

Hydraulic Analysis: A hydraulic analysis was performed in order to estimate the water surface elevations for the two creeks. Existing condition's water levels were determined first. Water levels for proposed condition, which included the access road, followed. Comparison of water elevations for both conditions would fall within the limits established by Regulation No. 13. The US Army Corps of Engineer's HECRAS computer model was used.

Mitigation Analysis: A mitigation analysis was made in order to counteract the impact of the proposed development. A mitigation pond was employed as a detention structure. HEC-1 model was used for the mitigation analysis. 2-, 10-, 25-, 50- and 100 frequency discharges were analyzed for mitigation.

Conclusions and recommendations were elaborated.

Authorization

Sr. José Valdés on behalf of Palacios de Gurabo, Inc. authorized this study, under a contract signed with Eng. Casiano Ancalle, principal of CA Engineering.

II. BACKGROUND INFORMATION

Location

The project site is located at PR-9945, Celada Ward, in the Municipality of Gurabo. The site access is through road PR-9945 which branchs out state road PR-943. The approximate total area of the project is 246 acres. Figure 1 illustrates the project site location on the USGS Quadrangle. Figure 2 shows the development layout.

Topography

In general, the topography of the site slopes down from north to south. At least two hills are evident in the center of the site, but no major effect on the surface runoff direction is derived form them, except for its local effect that is negligible compared with the dominant direction of the runoff from north to south. Ground elevations range from 200.00 to 45.00 meters (m.s.l.). See Figure 3.

Water Bodies

Two water bodies run across the site. No flow records are available from either one. The majority of the project's runoff discharges to these two creeks. The remaining runoff discharges directly to the downstream, to Río Gurabo, which runs about 300 meters south.

Flooding

According to the Puerto Rico Planning Board Flood map shown in Figure 12, the project site is actually outside of the regulatory flood plain, except a very small tip where no construction is contemplated. A partial copy of sheets 170B of FEMA's flood map is also included as Figure 7.

Former Studies

Though no specific studies have been made for the project site in the past, FEMA's study for Rio Gurabo is very much related to it as its levels and flood footprint is used in this study. The water surface elevations of FEMA's study were used as reference for the hydraulic analysis of the present study.

Field Information

Field data used in this study was taken from the topographic information provided. Results obtained in this study are strictly based on this information. The topography is tied to mean sea level reference. This fieldwork is included in the pocket attached to the back cover of this study as Appendix H.

Study Level

This study is intended as an aid to the design engineer in the preparation of the construction drawings for the recommended structures. Figures, schematics and drawings must not be used as construction drawings. The design engineer must elaborate the construction drawings in agreements with the recommendations of this study.

III. HYDROLOGIC ANALYSIS

The computer program entitled Flood Hydrograph Package (HEC-1), developed by the U.S. Army Corps of Engineers [1990], was used for the performance of the hydrologic analysis. Using this program, the Unit Hydrograph method and the Runoff Curve Number (CN) method, both developed by the Soil Conservation Service (SCS), were applied to determine the design hydrograph. This was computed by a process of translating the rainfall excess into a runoff hydrograph known as convolution.

Peak discharges for 2-, 10-, 25-, 50- and 100-year storm frequency were estimated for the existing condition and proposed condition.

Drainage Areas

Seven drainage areas have been identified for the existing condition at the project site; they were labeled P1a, P1b, P1c, P1d, P3 contributing to watercourse #1, and areas P4a and P4bc contributing to watercourse #2 (Figure 4). At proposed condition, the area of P1a and P1b was merged in P1ab and area P4bc was split in two subareas called P4b and P4c, as shown in Figure 5. The total area of the project site is approximately 246 acres.

Four upstream offsite drainage areas were identified as affecting the project site; they were labeled E1 to E4 as shown in Figures 4 and 5, for existing and proposed condition, respectively. Basins E1, E2, E3 contribute to watercourse #1 and E4 to watercourse #2. The total offsite drainage area is approximately 590 acres. The offsite basins are primarily undeveloped.

Table 1 shows the drainage areas taken into account for the hydrologic analysis, for both existing and proposed condition.

Table 1
Drainage Areas

	Name	Area, acres	
		Existing	Proposed
Project Areas	P1a	11.65	-
	P1b	35.17	-
	P1ab	-	46.82
	P1c	15.35	6.49
	P1d	6.57	6.57
	P3	68.83	79.36
	P4a	28.58	18.05
	P4bc	79.91	-
	P4b	-	58.72
	P4c	-	30.05
Offsite Areas	E1	311.60	311.60
	E2	166.94	166.94
	E3	78.68	78.68
	E4	32.72	32.72

Runoff Pattern

The project site participates of two drainage systems that merge right at the south limit of the project site: Watercourse #1 and Watercourse #2. At proposed condition, these drainage systems were kept with minor modifications; such as reshaping the drainage area and introducing runoff discharge mitigation structures at some areas (areas P3, P1ab and P4b).

Curve Numbers

Curve numbers were established according to the SCS's Soil Maps, the project area and the offsite basins are mainly classified in 8 types: Aceitunas clay, Caguabo clay loam, Mucara clay, Naranjito silty, Coloso silty, Rio Arriba clay, Mabi clay and Sabana silty. The Hydrologic Soil Group classification was D for most of the soils, except for Aceitunas silty clay. CN value of 93

was assumed for the developed project site.

Appendix A includes the Curve Number computations for existing and proposed condition. Figure 6 shows the soil map corresponding to the project site and offsite areas.

Lag Time

The Lag Time (T_{Lag}) was estimated using the SCS method defined as:

$$T_{Lag} = \frac{L^{0.8}(S+1)^{0.7}}{1900\ Y^{0.5}}$$

where :	L	=	channel length (ft)
	S	=	1000/CN - 10
	Y	=	average watershed slope

Detailed Lag Time calculations are shown in Appendix A.

Rainfall Data

The variation of rainfall volume with time was required as part of the storm input for the SCS Curve Number method. Therefore, the development of a design storm with a rainfall frequency and duration was necessary to compute the design hydrograph for the watershed.

Rainfall data used in this study was obtained from the Technical Paper No. 42 (TP-42) [National Weather Service, 1961]. The 24-hour duration rainfall depths for 100, 50, 25, 10 and 2 years frequency are shown in Table 1.

Table 2
Rainfall Depths

Frequency *Years*	Depth *inches*
100	11.9
50	10.9
25	9.7
10	8.0
2	4.9

Depth-Area Adjustment

Point rainfall estimates obtained from the TP-42 represent values for areas up to 10 mi^2; therefore, a depth-area adjustment should be applied to the rainfall data when the watershed area is greater. In this case, the largest watershed consists of 0.4869 mi^2. Hence, this adjustment was not applied.

Time Distribution of Rainfall

The SCS Type II Storm Distribution methodology was used to distribute the rainfall depth in time. This method is considered acceptable for small areas.

Rainfall Extraction

Rainfall extraction such as vegetative interception, depressional storage, and infiltration were estimated using the SCS's Runoff Curve Number method. Though this method is used to predict runoff volume directly, the rainfall extraction is incorporated in the model as function of the curve number of the watershed.

Hydrologic Analysis Results

Hydrologic analysis was made for all the drainage areas. Individual and composite runoff hydrographs were obtained using HEC-1 methodology. Table 3 shows the summary of the

results for this analysis. Input and output data for the HEC-1 model for existing and proposed condition are included in Appendix B and C, respectively.

Table 3
Peak Discharges

	AREA	Peak Discharge, cfs				
		2-yr	10-yr	25-yr	50-yr	100-yr
Existing	P1a	50	92	116	132	145
	P1b	98	184	234	267	294
	P1a+P1b	125	239	304	348	383
	P3	245	445	559	635	695
	E3	276	498	625	709	776
	P3+E3	521	943	1184	1344	1471
	P1c	38	74	95	109	120
	P1d	29	53	67	76	83
	E1	721	1336	1689	1922	2109
	E2	514	934	1175	1334	1461
	P4a	124	227	286	325	357
	P4bc	156	318	413	476	527
	E4	127	235	297	338	370
	P4a+P4bc+E4	337	648	829	950	1046
Proposed	P1ab	162	275	339	382	416
	P3	261	459	573	648	708
	E3	276	498	625	709	776
	P3+E3	536	957	1198	1357	1484
	P1c	16	30	38	43	47
	P1d	29	53	67	76	83
	E1	721	1336	1689	1922	2109
	E2	514	934	1175	1334	1461
	P4a	74	130	162	183	200
	P4b	147	250	309	349	380
	P4c	88	150	186	209	228
	P4b+P4c	230	392	485	546	595

E4	127	235	297	338	370
P4a+Pab+P4c+E4	356	625	778	880	961

IV. RUNOFF MITIGATION ANALYSIS

The development of the site will increase the runoff discharge. The Puerto Rico Planning Board Regulation No. 3 requires a flow mitigation structure wherever an increase in discharge is produced. Therefore, detention structures that will mitigate the overall increase in runoff discharge was used.

Methodology

The computer program HEC-1 provides means for routing a hydrograph through detention structures. The purpose of detention is that the proposed condition peak discharge does not exceed the existing condition peak discharge. Mitigation ponds were considered at areas P1ab, P3 and P4b. These ponds will reduce the combined peak discharge of the overall project drainage areas to magnitudes below the discharge at existing condition.

Mitigation Pond

Three detention ponds were evaluated in the study. These ponds are addressed to mitigate the increment in discharge from the site and from Palacios de Gurabo development. The pond will be located at the lower part of Area P1ab, P3 and P4b; see Figure 8.

Depth-Volume Relations

Volume-depth relations developed for the mitigation systems: Pond 1 which serves area P1ab is based on a pond with a 2,090-square-meter base area and a bank slope of 2H:1V; Pond2 at Area P3 is based on a pond with a 1,820-square-meter base area and a bank slope of 2H:1V; and Pond3 at Area P4b is based on a pond with a 3,353-square-meter base area and a bank slope of 2H:1V. Volume-Depth curve computations are included in Appendix D.

Flow Rating Curve

Flow–Depth relation for the detention Pond1 was estimated considering the discharge through one (1) 4.5' -diameter orifice located at the bottom of the pond and a 7.31-meter long weir at

2.60 meter over the pond bottom. For the detention Pond2, flow was estimated considering the discharge through three 4.0' -diameter orifice located at the bottom of the pond and a 7.31-meter long weir at 2.50 meter over the pond bottom. For the detention Pond3, flow was estimated considering the discharge through one 3.0' -diameter orifice located at the bottom of the pond and a 7.31-meter long weir at 2.30 meter over the pond bottom . Flow through the orifices was computed using Torrecelli's formula. Appendix D shows the computations for the flow-depth relationship and the curves.

Results

The results of the detention analysis show that the proposed detention ponds provide appropriate runoff mitigation for the 100-year frequency discharges. Routing the discharge through the detention Pond1 at area P1ab, the 100-year discharge was reduced from 416 cfs to 349 cfs, which is less than the discharge computed for existing condition, 383 cfs. At Pond2, the 100-year discharge was reduced from 708 cfs to 647 cfs para el pond2, which is less than the discharge computed for existing condition, 695 cfs. And at Pond3, the 100-year discharge was reduced from 595 cfs to 505 cfs, which is less than the discharge computed for existing condition, 527 cfs; thus complying with Regulation No.3. Mitigation for more recurrent discharges was also verified.

Input and output data for the HEC-1 mitigation model are included in Appendix E. Table 4 shows the comparison of the discharges for existing, proposed and mitigation condition.

Table 4
Peak Discharges results for Existing, Proposed and Mitigation

AREA		Peak Discharge, cfs				
		2-yr	10-yr	25-yr	50-yr	100-yr
Existing	P1a	50	92	116	132	145
	P1b	98	184	234	267	294
	P1a+P1b	125	239	304	348	**383**
	P3	245	445	559	635	**695**
	E3	276	498	625	709	776
	P3+E3	521	943	1184	1344	1471
	P1c	38	74	95	109	120
	P1d	29	53	67	76	83
	E1	721	1336	1689	1922	2109
	E2	514	934	1175	1334	1461
	P4a	124	227	286	325	357
	P4bc	156	318	413	476	**527**
	E4	127	235	297	338	370
	P4a+P4bc+E4	337	648	829	950	1046
Proposed	P1ab	162	275	339	382	**416**
	P3	261	459	573	648	**708**
	E3	276	498	625	709	776
	P3+E3	536	957	1198	1357	1484
	P1c	16	30	38	43	47
	P1d	29	53	67	76	83
	E1	721	1336	1689	1922	2109
	E2	514	934	1175	1334	1461
	P4a	74	130	162	183	200
	P4b	147	250	309	349	380
	P4c	88	150	186	209	228
	P4b+P4c	230	392	485	546	**595**
	E4	127	235	297	338	370
	P4a+Pab+P4c+E4	356	625	778	880	961

Proposed w/ Mitigation	P1ab (POND1)	125	184	259	309	**349**
	P3 (POND2)	244	401	503	581	**647**
	E3	276	498	625	709	776
	P3(POND2)+E3	499	846	1036	1181	1308
	P1c	16	30	38	43	47
	P1d	29	53	67	76	83
	E1	721	1336	1689	1922	2109
	E2	514	934	1175	1334	1461
	P4a	74	130	162	183	200
	P4b (POND3)	74	188	261	308	343
	P4c	88	150	186	209	228
	P4b (POND3)+P4c	140	262	377	453	**505**
	E4	127	235	297	338	370
	P4a+POND3+E4	289	513	637	720	786

Mitigation Structure Dimensions and Accessories

Final dimensions for the detention pond will include a minimum free board of 0.30 meters. The detention pond will have the characteristics shown in Table 5.

Table 5
Retention Pond Characteristics

Pond1	Dimensions	Bottom Area	2,090 m^2
		Height	3.37 m
	Outlet Control	Orifice @ bottom	1-4.5'Diameter
		Weir Length @ 2.60m	7.31 m
Pond2	Dimensions	Bottom Area	1,820 m^2
		Height	3.27 m

	Outlet Control	Orifice @ bottom	3-4.0'Diameter
		Weir Length @ 2.50m	7.31 m
Pond3	Dimensions	Bottom Area	3,352 m^2
		Height	3.31 m
	Outlet Control	Orifice @ bottom	1-3.0'Diameter
		Weir Length @ 2.30m	7.31 m

Schematic layout of the detention system is presented in Figures 9, 10 and 11, for Pond 1, 2 and 3, respectively.

Pond Discharge

The pond outlet must be a (2)-66"-diameter pipe for Pond1 discharging to Watercourse #1. For Pond2, the outlet pipe must be a (3)-72"-diameter pipe discharging to Watercourse #1. And for Pond 3, the outlet pipe will be one (2)-66" diameter pipe discharging to Watercourse #2.

V. HYDRAULIC ANALYSIS

A hydraulic analysis was made for the two watercourses in order to find the 100-year water surface elevation, and in order to size the crossing structure needed at Watercourse #2 for the project access road.

The hydraulic analysis was made using the mathematical model HEC-RAS developed by the US Corps of Engineers. For this model, the hydraulic regime is steady, uniform, and one-dimensional. The model accepts changes in the geometry of the watercourse, bank-bed-overbank friction coefficient and shapes of hydraulic structures.

The friction coefficient used in the modeling was obtained from visual inspection of the watercourses bed and banks; and crosschecked with the typical values provided by Barnes (1967) and Chow (1959).

Cross sections for the creek were taken from the fieldwork provided. This fieldwork is shown in Appendix H. Figure 12 depicts the location of the cross sections.

Roughness

Manning coefficients estimated for the model are 0.013 for concrete, 0.045 for the channel and 0.055 for the over banks. These values reflect the changes in direction and the irregular shape of the channel bed, and the vegetation present in the courses.

Contraction and Expansion Coefficients

Coefficients of contraction and expansion used are those recommended by the HEC-RAS user's manual. Thus, coefficients of 0.1 and 0.3 respectively were used for gradual transitions.

Starting Water Surface Elevation

At the point of discharge of the two watercourses, the regulatory 100-year flood elevation is about 49.90 meters. This elevation would have been the starting water elevation for the present hydraulic analysis. However, this elevation cannot be reproduced provided that the survey work was referred to mean sea level as certified. The, the starting water elevation was obtained by the slope-area method, and by this method the elevation is much over the regulatory level.

Hydraulics for Existing Condition

The existing condition corresponds to the segment of the watercourses inside the project site including all existing structures such as crossing structures. Figure 12, where the cross sections are located, pictures the watercourses analyzed in this study.

The hydraulic analysis was based on discharges obtained by the hydrologic analysis. Discharges for Watercourse #1 belong to the hydrologic addition of the individual discharges coming from areas E1, E2, E3, P1a, P1b, P1c, P1d and P3. And the discharges for Watercourse #2 are the ones coming from areas, E4, P4a and P4bc and. Flow regime at the existing condition as well as for the proposed condition was assumed to be subcritical in some segments and supercritical in others.

The computer output for the existing condition is included in Appendix F. The following Tables 6 and 7 includes the summary of the results for watercourses #1 and #2, respectively.

Table 6
Existing Condition Hydraulics 100-yr flow
Watercourse #1

Reach	River Sta	Profile	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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	20	100Y	21.97	89.00	90.72	90.72	91.21	0.023721	3.09	7.12	7.47	1.01
1	19	100Y	21.97	86.17	87.08	87.42	88.20	0.121247	4.67	4.70	9.76	2.15
1	18	100Y	21.97	84.92	85.57	85.57	85.78	0.027325	2.03	10.80	26.11	1.01
1	17	100Y	41.65	74.44	75.25	75.88	78.06	0.274874	7.44	5.60	10.81	3.30
1	16	100Y	83.02	73.70	75.34	75.34	75.92	0.017675	3.38	25.15	23.33	0.97
1	15	100Y	85.37	67.00	67.49	68.15	71.05	0.433187	8.36	10.21	23.55	4.05
1	14	100Y	85.37	65.98	67.73	67.73	68.30	0.019875	3.36	25.40	22.28	1.00

1	13	100Y	85.37	62.40	63.93	64.29	65.06	0.076692	4.98	18.87	28.33	1.85
1	12	100Y	85.37	59.00	64.30	62.38	64.41	0.001168	1.53	66.22	35.12	0.27
1	11	100Y	145.09	57.00	64.36		64.37	0.000066	0.63	340.98	72.99	0.08
1	10	100Y	145.09	56.92	64.33	61.32	64.36	0.000220	0.91	247.66	92.12	0.12
1	9.5		Culvert									
1	9	100Y	145.09	56.00	58.21	58.21	58.81	0.018655	3.43	42.69	39.34	0.99
1	8	100Y	145.09	55.00	56.47	56.59	57.04	0.027012	3.47	46.59	64.38	1.15
1	7	100Y	145.09	53.79	55.64	55.23	55.86	0.006942	2.37	77.09	68.93	0.63
1	6	100Y	149.19	53.00	54.20	54.15	54.48	0.019258	2.33	63.99	97.24	0.92
1	5	100Y	149.19	51.00	53.73		53.82	0.002139	1.76	133.37	106.54	0.37
1	4	100Y	157.51	51.00	53.63		53.71	0.001205	1.36	141.11	81.07	0.28
1	3	100Y	160.90	51.00	53.65		53.67	0.000220	0.61	275.03	117.65	0.12
1	2	100Y	160.90	50.00	53.56		53.65	0.000876	1.40	140.71	70.62	0.25
1	1	100Y	160.90	50.00	53.34	52.52	53.56	0.002898	2.24	87.06	51.17	0.44

Table 7
Existing Condition Hydraulics 100-yr flow
Watercourse #2

Reach	River Sta	Profile	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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	30	100Y	10.49	70.00	72.53	70.35	72.53	0.000026	0.18	58.27	30.44	0.04
1	29	100Y	16.16	69.00	72.52	70.09	72.53	0.000034	0.25	95.51	76.10	0.05
1	28.5		Culvert									
1	28	100Y	16.16	67.76	69.15	69.15	69.53	0.025315	2.93	6.38	8.38	0.95
1	27	100Y	16.16	66.00	66.53	66.62	66.85	0.057188	2.68	6.69	19.26	1.42
1	26	100Y	16.16	63.00	63.81	63.81	64.11	0.024686	2.43	6.65	11.21	1.01
1	25	100Y	16.16	61.00	61.65	61.54	61.79	0.013628	1.68	9.64	18.45	0.74
1	24	100Y	16.16	60.00	60.90	60.90	61.17	0.025320	2.30	7.02	13.19	1.01
1	23	100Y	16.16	57.00	57.45	57.28	57.50	0.006543	0.99	16.40	40.27	0.49
1	22	100Y	32.34	54.00	55.25	55.19	55.57	0.018195	2.50	12.96	16.72	0.90
1	21	100Y	32.34	52.33	53.44	53.22	53.55	0.008011	1.48	21.83	33.86	0.59

Hydraulics for Proposed Condition

The proposed condition is similar to that of the existing condition except that it includes the road crossing structure to be installed across the creek. Several alternatives were analyzed but the most cost-effective one was a one 10-meter span bridge. Figure 13 shows this crossing structure.

The computer output for the hydraulics analysis is included in Appendix G. The following Tables 8 and 9 includes the summary of the results for watercourses #1 and #2, respectively

Table 8
Proposed Condition Hydraulics 100-yr
Watercourse #1

Reach	River Sta	Profile	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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	20	100Y	21.97	89.00	90.72	90.72	91.21	0.023721	3.09	7.12	7.47	1.01
1	19	100Y	21.97	86.17	87.08	87.42	88.20	0.121247	4.67	4.70	9.76	2.15
1	18	100Y	21.97	84.92	85.57	85.57	85.78	0.027325	2.03	10.80	26.11	1.01
1	17	100Y	63.34	74.44	75.52	76.19	78.09	0.173967	7.09	8.93	13.09	2.74
1	16	100Y	81.66	73.70	75.33	75.33	75.90	0.017775	3.37	24.82	23.21	0.97
1	15	100Y	81.66	67.00	67.47	68.12	71.05	0.458399	8.38	9.74	23.35	4.14
1	14	100Y	84.01	65.98	67.71	67.72	68.28	0.019933	3.35	25.07	22.14	1.01
1	13	100Y	84.01	62.40	63.92	64.28	65.05	0.077422	4.97	18.57	28.09	1.85
1	12	100Y	84.01	59.00	64.28	62.35	64.39	0.001156	1.52	65.64	35.00	0.27
1	11	100Y	143.73	57.00	64.34		64.35	0.000065	0.63	339.69	72.92	0.08
1	10	100Y	143.73	56.92	64.32	61.01	64.34	0.000220	0.91	246.04	91.75	0.12
1	9.5		Culvert									
1	9	100Y	143.73	56.00	58.20	58.20	58.80	0.018722	3.42	42.37	39.17	1.00
1	8	100Y	143.73	55.00	56.47	56.58	57.03	0.026775	3.45	46.43	64.33	1.14
1	7	100Y	143.73	53.79	55.64	55.23	55.85	0.006910	2.36	76.70	68.79	0.63
1	6	100Y	143.73	53.00	54.16	54.13	54.45	0.020365	2.37	60.65	93.80	0.94
1	5	100Y	143.73	51.00	53.71		53.79	0.002088	1.72	130.94	105.98	0.37
1	4	100Y	153.61	51.00	53.61		53.69	0.001188	1.34	139.35	80.73	0.28
1	3	100Y	154.94	51.00	53.63		53.65	0.000210	0.60	272.48	117.60	0.12
1	2	100Y	154.94	50.00	53.55		53.63	0.000830	1.35	139.54	70.27	0.25
1	1	100Y	154.94	50.00	53.34	52.47	53.55	0.002687	2.16	87.06	51.17	0.42

Table 9
Proposed Condition Hydraulics 100-yr
Watercourse #2

Reach	River Sta	Profile	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
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	30	100Y	10.49	70.00	72.53	70.35	72.53	0.000026	0.18	58.27	30.44	0.04
1	29	100Y	16.16	69.00	72.52	70.09	72.53	0.000034	0.25	95.51	76.10	0.05
1	28.5		Culvert									
1	28	100Y	16.16	67.76	69.15	69.15	69.53	0.025315	2.93	6.38	8.38	0.95
1	27	100Y	16.16	66.00	66.53	66.62	66.85	0.057188	2.68	6.69	19.26	1.42
1	26	100Y	16.16	63.00	63.81	63.81	64.11	0.024684	2.43	6.65	11.21	1.01
1	25	100Y	16.16	61.00	61.94	61.54	62.00	0.003374	1.03	15.64	21.78	0.39
1	24.5		Bridge									

1	24	100Y	16.16	60.00	60.74	60.90	61.25	0.058847	3.17	5.09	11.15	1.50
1	23	100Y	16.16	57.00	57.45	57.28	57.50	0.006543	0.99	16.40	40.27	0.49
1	22	100Y	32.34	54.00	55.25	55.19	55.57	0.018195	2.50	12.96	16.72	0.90
1	21	100Y	32.34	52.33	53.44	53.22	53.55	0.008011	1.48	21.83	33.86	0.59

Results

The maximum increase in floodwater levels due to a hydraulic structure allowed by the Puerto Rico Planning Board Regulation No. 13 for rural areas is 0.30 meters. There is no increase in water level at the cross section located in the immediate upstream of the project site. Though within the project site, just upstream of the proposed bridge, at Cross Section 25, the increase in water levels was 0.29 meter. Since this increase is constrained within the project site, and no increase is reflected outside, the level increase requirement called by Regulation No. 3 is fully fulfilled.

Using the results of the hydraulics analysis, the 100-year floodplain was delineated, as shown in Figure 14 No construction will take place in the floodplain.

Local Storm Sewer System

The design engineer must convey the discharge form all areas though pipes and surface runoff over the roadways to the watercourses. Note that Areas P3 , P4a and P1c must be conveyed fort to their respective detention ponds before discharge into the watercourses.

Main 100-year collection discharge pipes may be necessary for some areas. Discharges from areas where surface runoff over the roadways are cloistered must be piped with a 100-year capacity pipes. The design engineer must identify these areas for appropriate drainage.

VI. CONCLUSIONS AND RECOMMENDATIONS

The following are the conclusions of this study:

1. According to the FEMA's Flood Insurance Rate Map, only a very small part of the project site is located in the floodplain of Río Gurabo. This part will not be developed.

2. Proposed condition discharge is higher than that of the existing condition. Runoff mitigation is needed as per the PR Planning Board Regulation No. 3.

3. The proposed mitigation structures reduce the increment in discharge due to the development to levels lower that those of the existing condition.

4. The 100-year floodplain footprint determined for the two storm watercourses will not be affected by the development. The development will be erected outside of this floodplain.

5. The regulatory water surface elevation at the point of discharge is lower than the 100-year water surface elevation n for the two watercourses at this same point.

The following are the recommendations of this study:

1. The project site's roadway elevation must be at least 2 ft above the local flood water levels as determined in this study. But the minimum roadway elevation at the road crossing structure will be 63.29 meters

2. The size, location and point of discharge of the runoff mitigation structures will be as indicated in this study. The ponds will have an outlet control as described in the Table 5 of this study.

3. The engineer will make sure that the site be graded in a way that the magnitude of the drainage areas be as assumed in this study.

4. Collection discharge pipes for cloistered drainage areas must be designed for a 100-year discharge.

5. The road crossing structure will consist on a bridge 10-mts. Span, provided with a minimum free board of 0.60 meters.

6. The segment of watercourse #2 at the entrance an the exit of the bridge will be provided by revetment, 6 meters long upstream and downstream of the bridge.

7. The engineer will include protection from erosion at the discharge of the detention ponds. Protection may be by rip-rap or gavions.

8. Maintenance of the road crossing culverts and mitigation pond outlet is necessary during operation. Maintenance shall consist on keeping the entrance free from clogging debris or vegetation.

Study Limits

All the recommendations specified in this study must be considered to assure the optimum performance of the proposed structures operation. The design engineer will be responsible for elaborating the drawings in conformance with the recommendations of this study.

The results of this study are based on free flow conditions through the hydraulic structures. Proper maintenance must be developed to assure this condition. On the event of the occurrence of any severe obstruction to the flow, the results and recommendations may be impaired. Finally, the design engineer must use results and recommendations included in this report only and exclusively for the intended purposes as indicated in this study.

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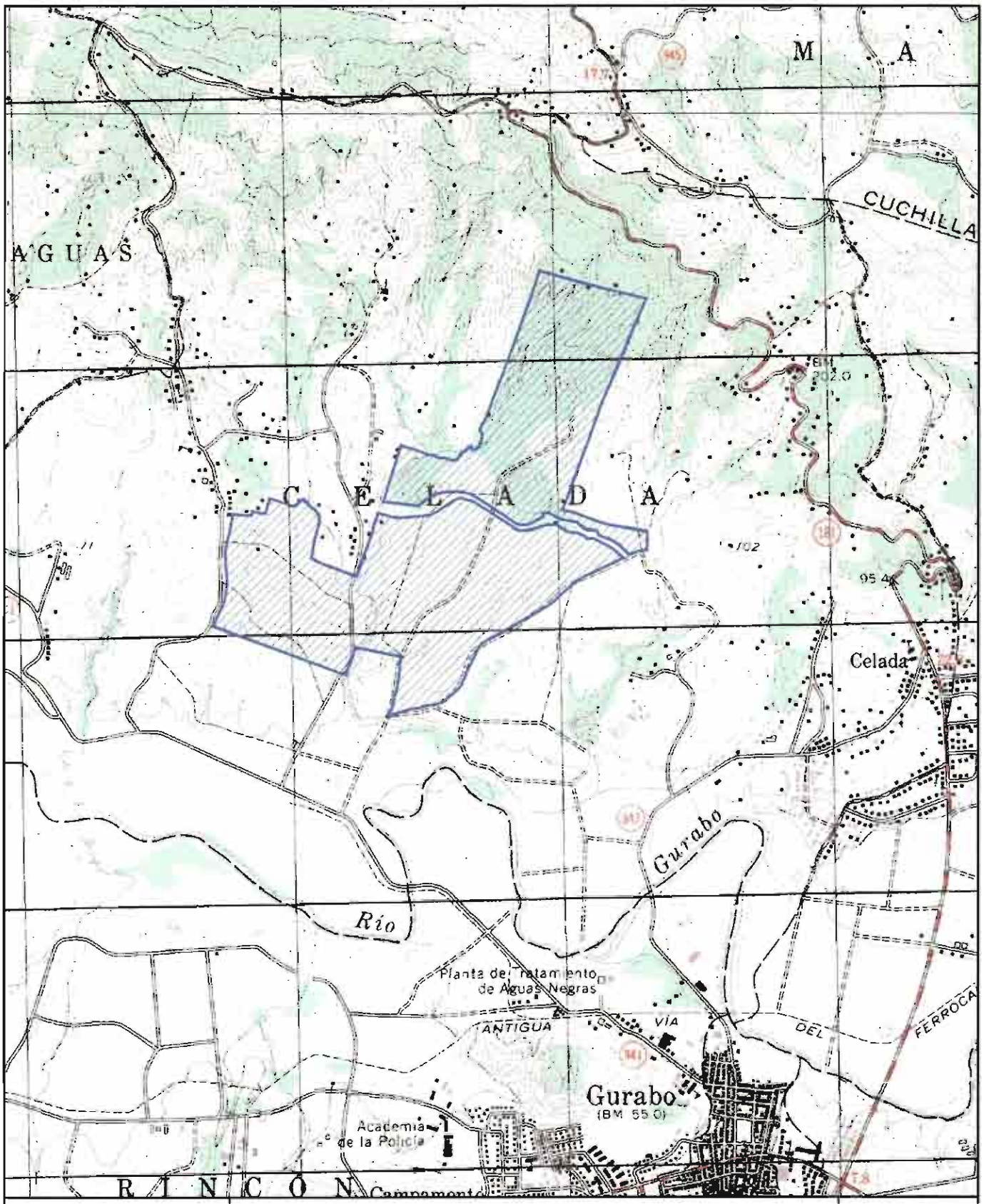
2. P.R. Planning Board, *Reglamento sobre Zonas Susceptibles a Inundaciones.* Reglamento de Planificación Número 13. Estado Libre Asociado de Puerto Rico, Oficina del Gobernador, 1992.

3. U.S. Soil Conservation Service, 1978. *Soil Survey of San Juan Area of Puerto Rico, Puerto Rico.* U.S. Department of Agriculture.

4. U.S. Army Corps of Engineers, 1990. *Flood Hydrograph Package (HEC-1), User's Manual.* Hydrologic Engineering Center. Davis, California.

5. U.S.Geological Survey. *Topographic Quadrangles of Gurabo.* Puerto Rico, 1982.

FIGURES

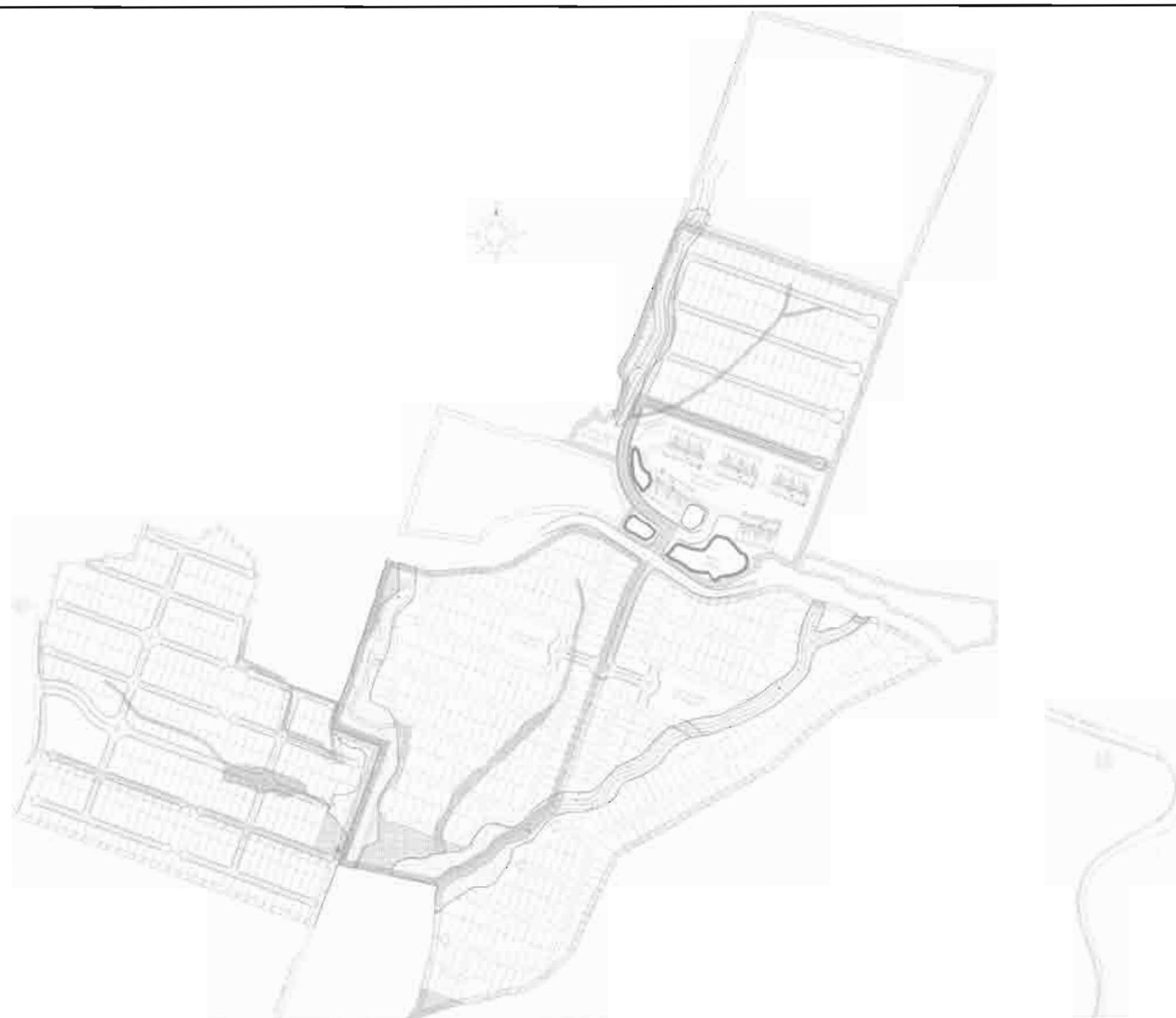


H/H STUDY – PALACIOS DE GURABO, GURABO, P.R.

Scale: 1:20,000

CA Engineering

Figure 1
Location Map



CA Engineering

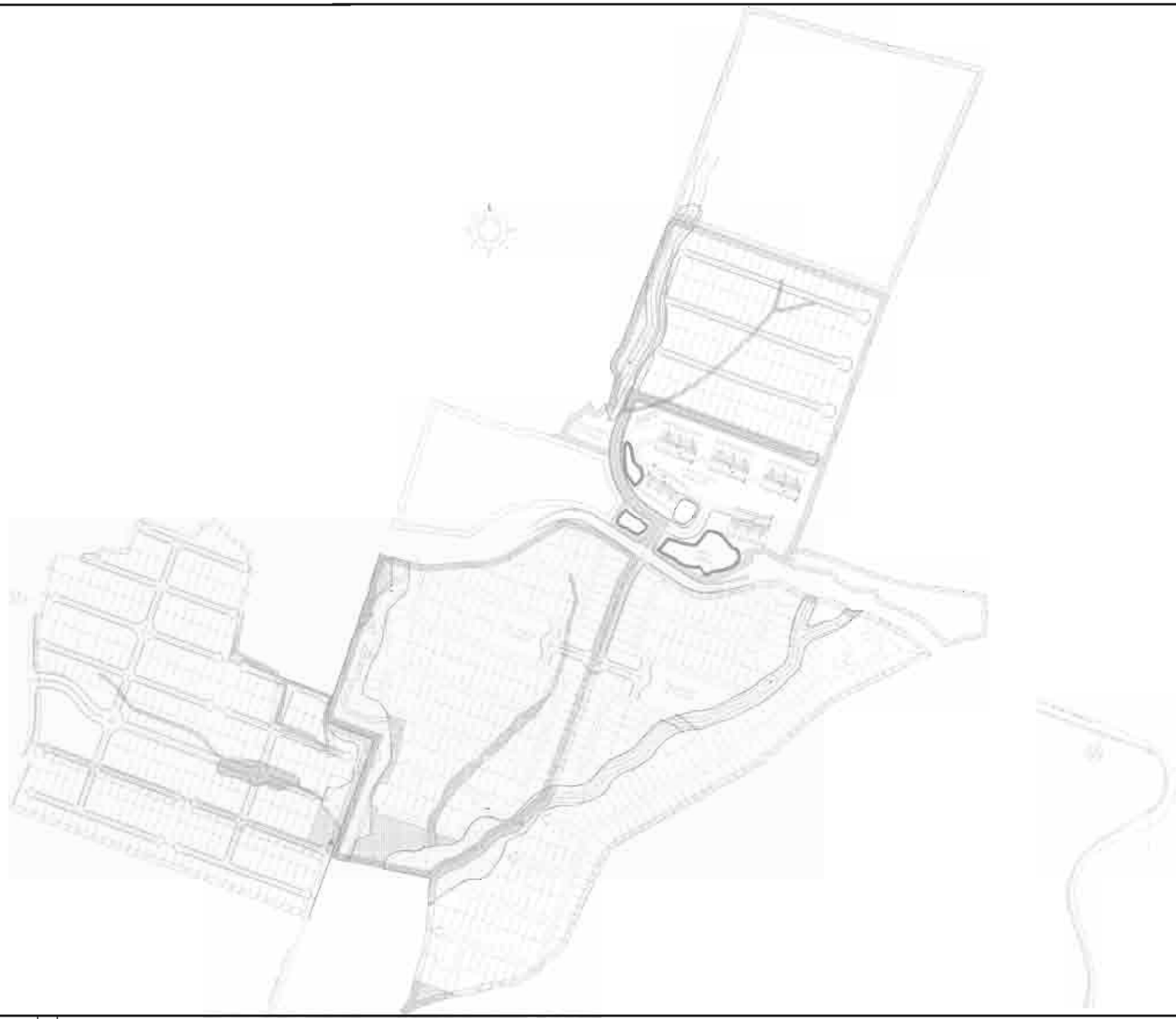
Scale: 1:7,500

H/H STUDY - PALACIOS DE GURABO, GURABO, PR

Figure 2

Proposed Development Layout

FIG.2



CA Engineering

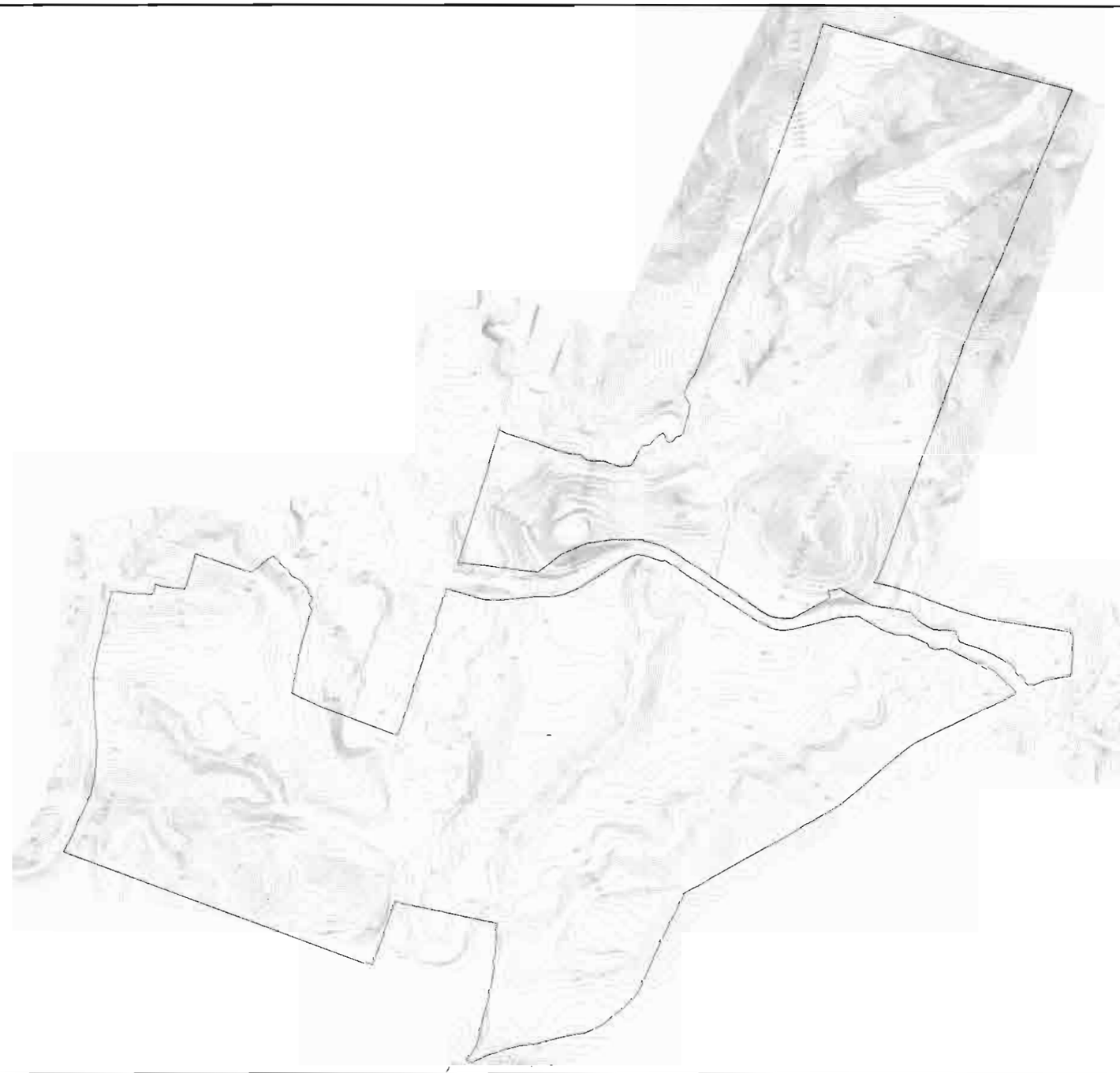
Scale: 1:7,500

H/H STUDY - PALACIOS DE GURABO, GURABO, PR

Figure 2

Proposed Development Layout

FIG.2



CA Engineering

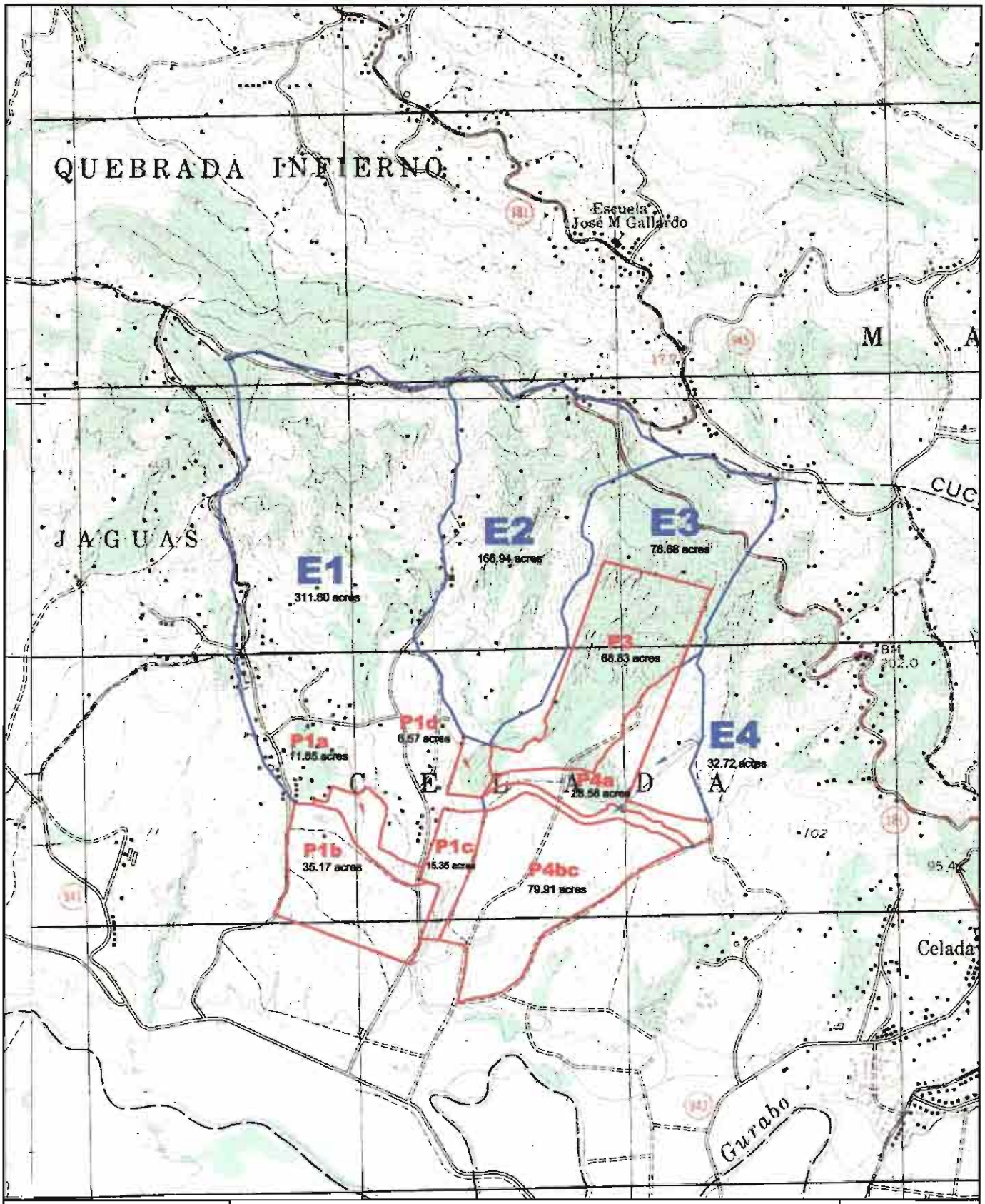
Scale: 1:7,500

H/H STUDY - PALACIOS DE GURABO, GURABO, PR

Figure 3

Topography for Existing Condition

FIG.3

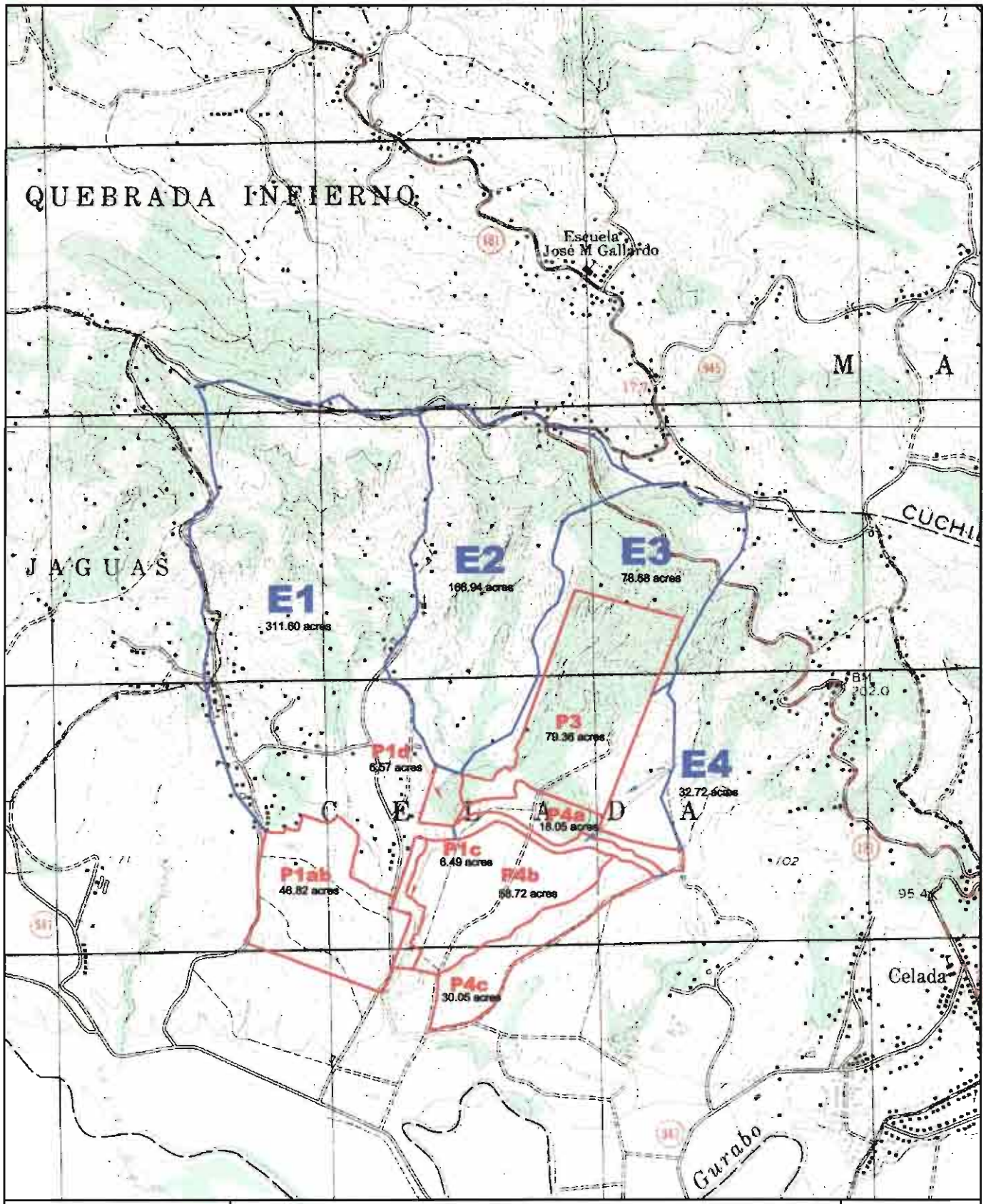


H/H STUDY – PALACIOS DE GURABO, GURABO, P.R.

Scale: 1:20,000

CA Engineering

Figure 4
Existing Condition Drainage Areas

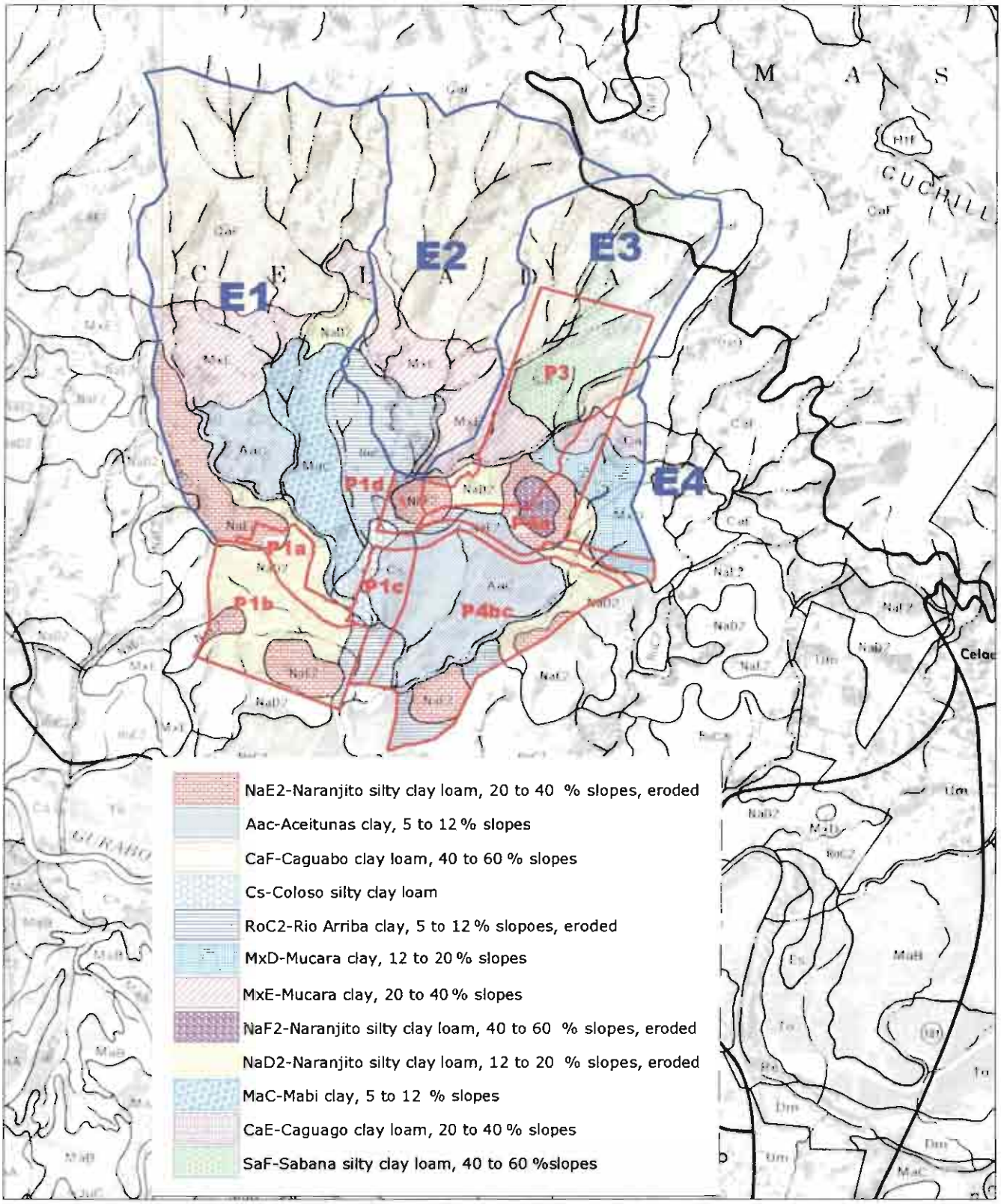


H/H STUDY – PALACIOS DE GURABO, GURABO, P.R.

Scale: 1:20,000

CA Engineering

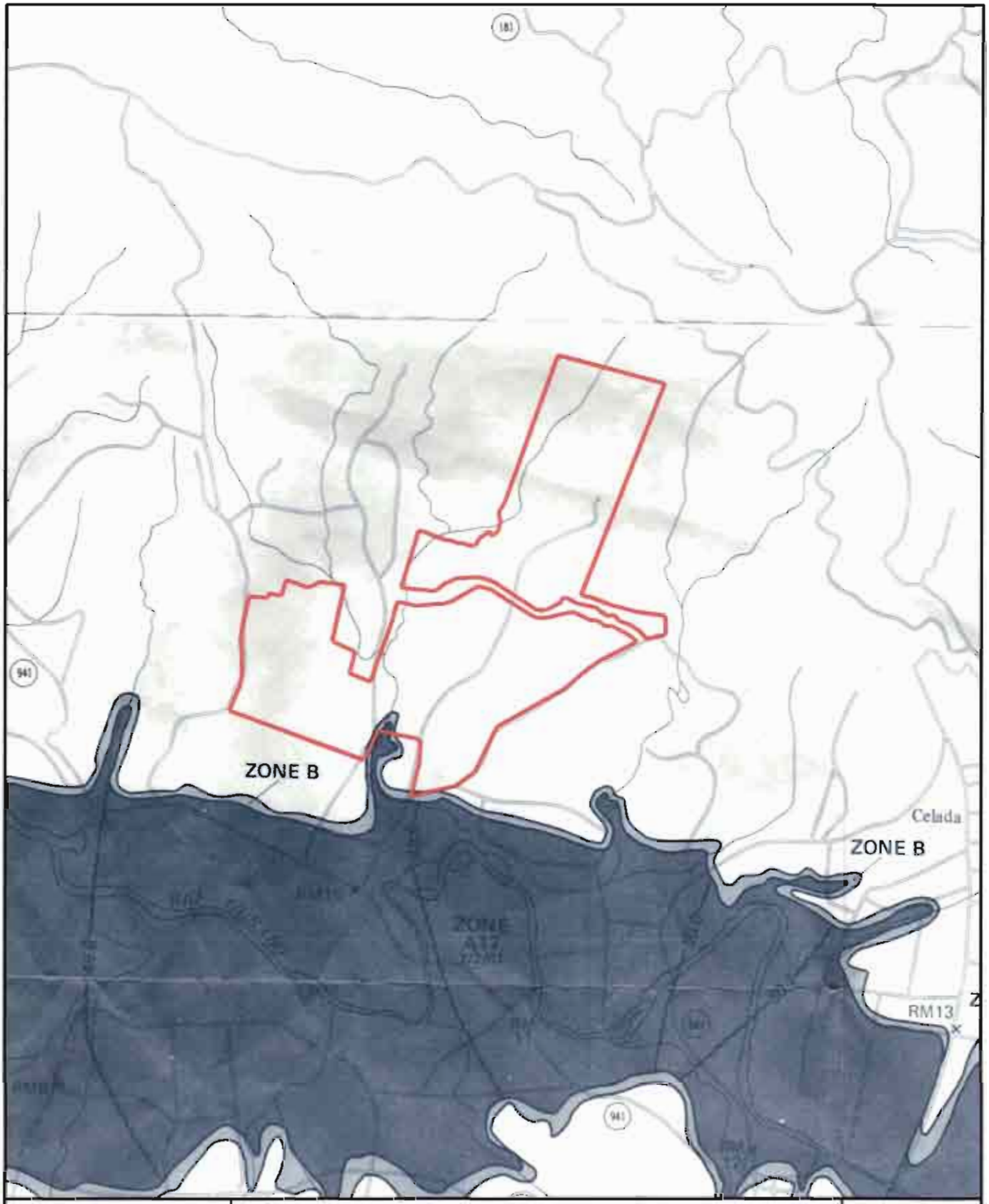
Figure 5
Proposed Condition Drainage Areas



Partial Copy of SCS's Soil Surveys of San Juan, Puerto Rico – Sheet 27 & 28

CA Engineering	H/H STUDY – PALACIOS DE GURABO, GURABO, P.R.	Scale: 1:20,000

Figure 6
Soils Map

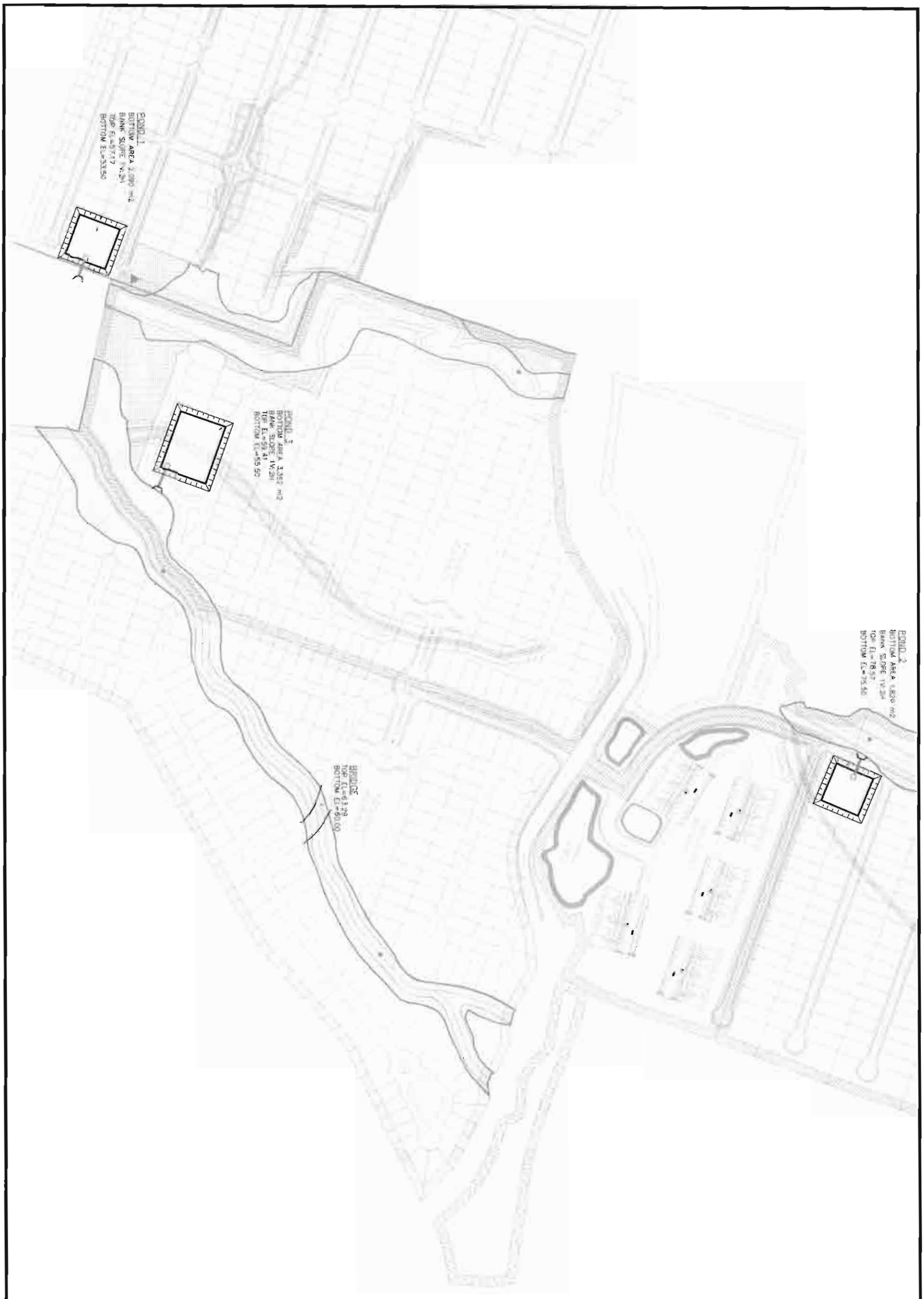


H/H STUDY - PALACIOS DE GURABO, GURABO, P.R.

Scale: 1:10,000

CA Engineering

Figure 7
FEMA Flood Map

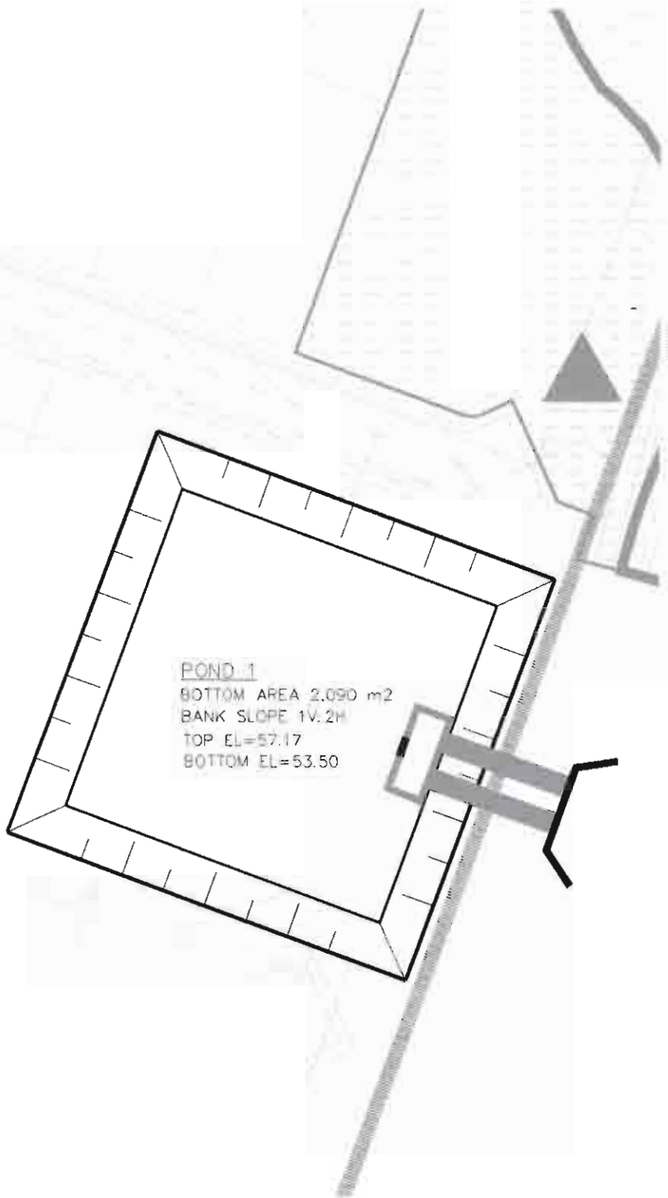


CA Engineering

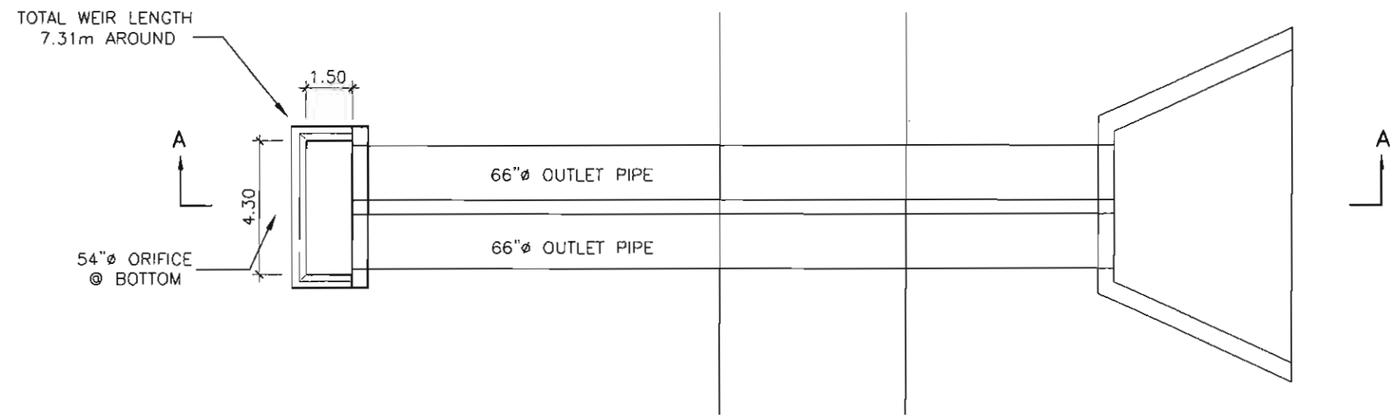
Scale: 1:4,000

H/H STUDY – HACIENDAS DEL MONTE, CEIBA, P.R.

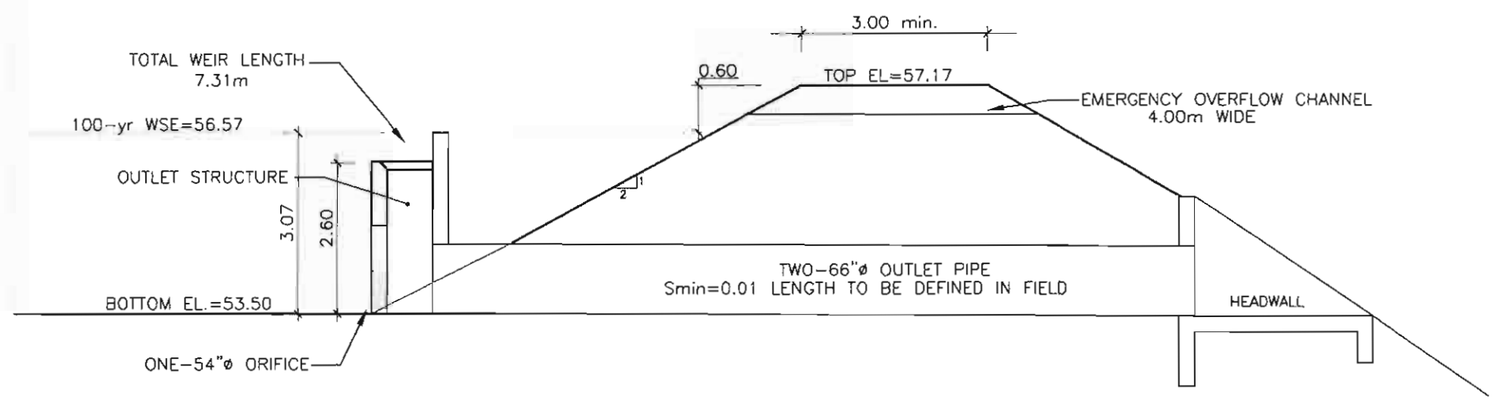
Figure 8
Layout of Proposed Structures



POND1 PLAN VIEW
NTS



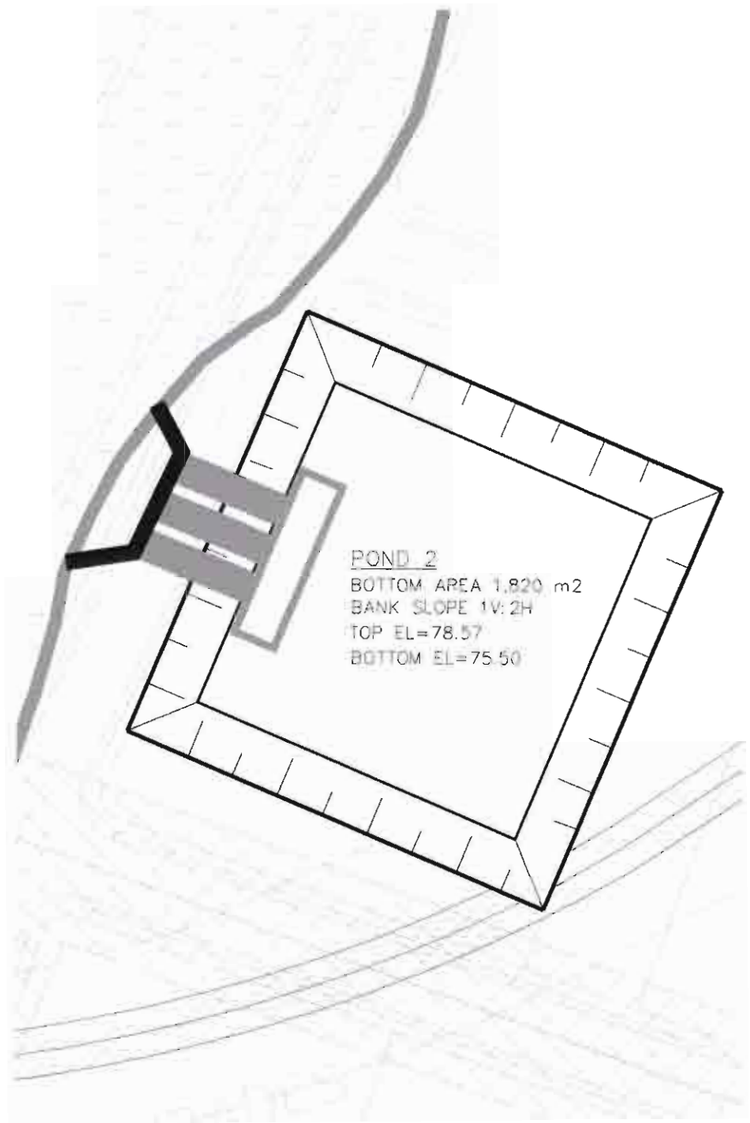
PLAN VIEW
NTS



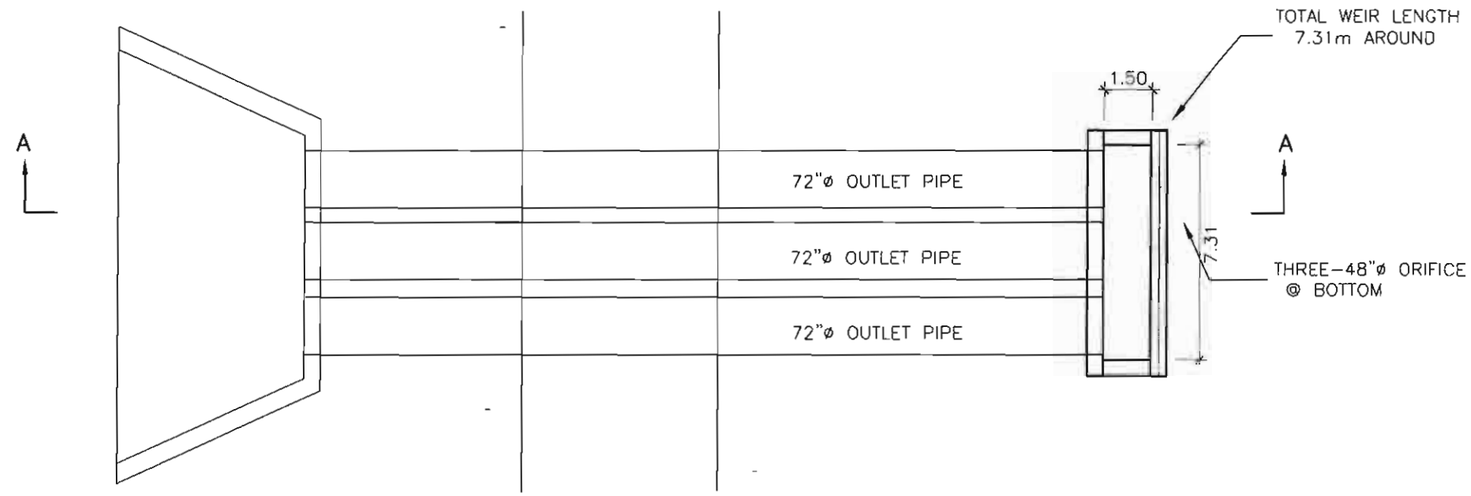
SECTION A-A
NTS

OUTLET STRUCTURE

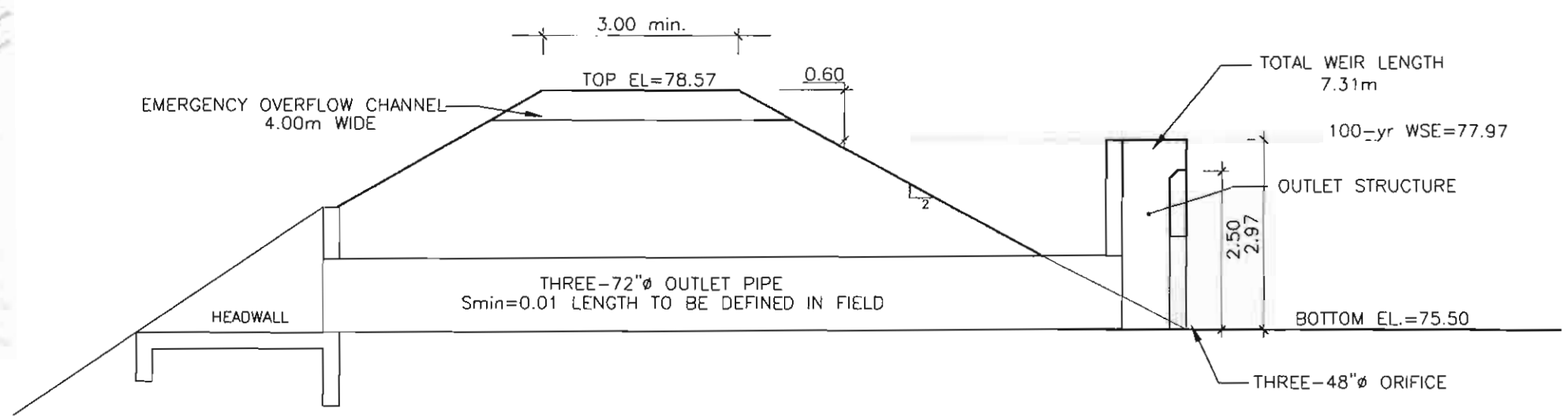
H/H STUDY PALACIOS DE GURABO	CA Engineering
Scale: NTS	
Schematics of the Detention Pond 1	Figure 9



POND2 PLAN VIEW
NTS



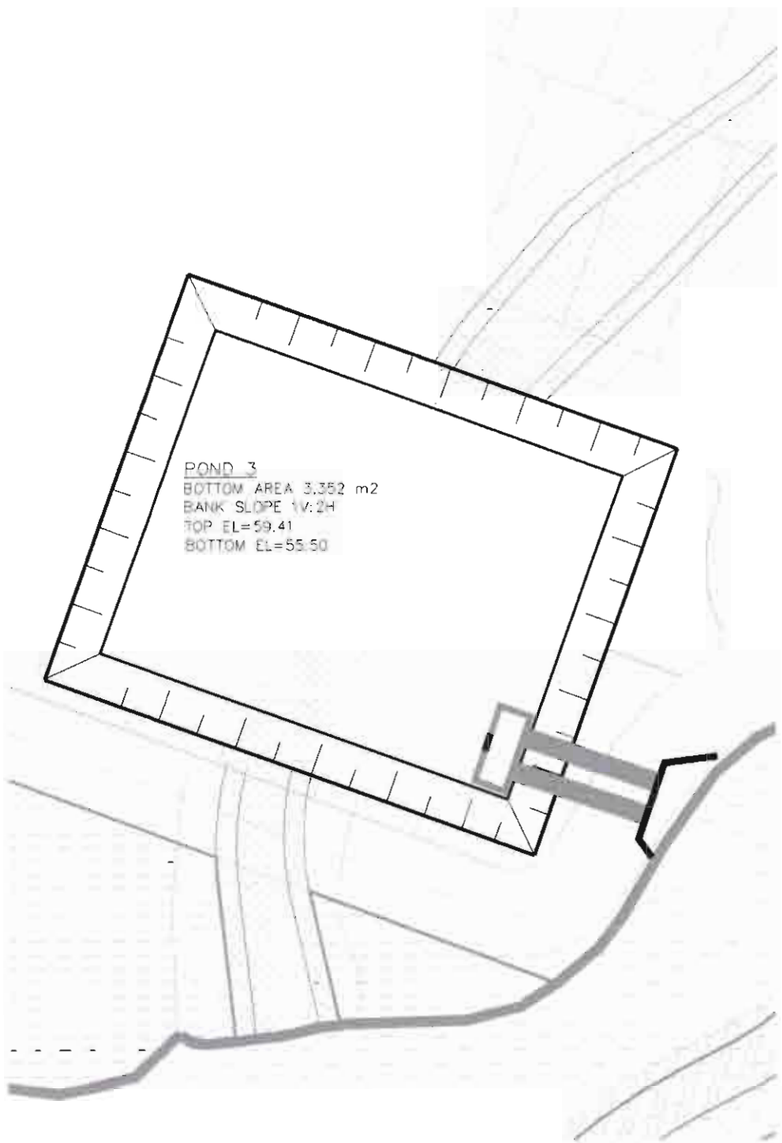
PLAN VIEW
NTS



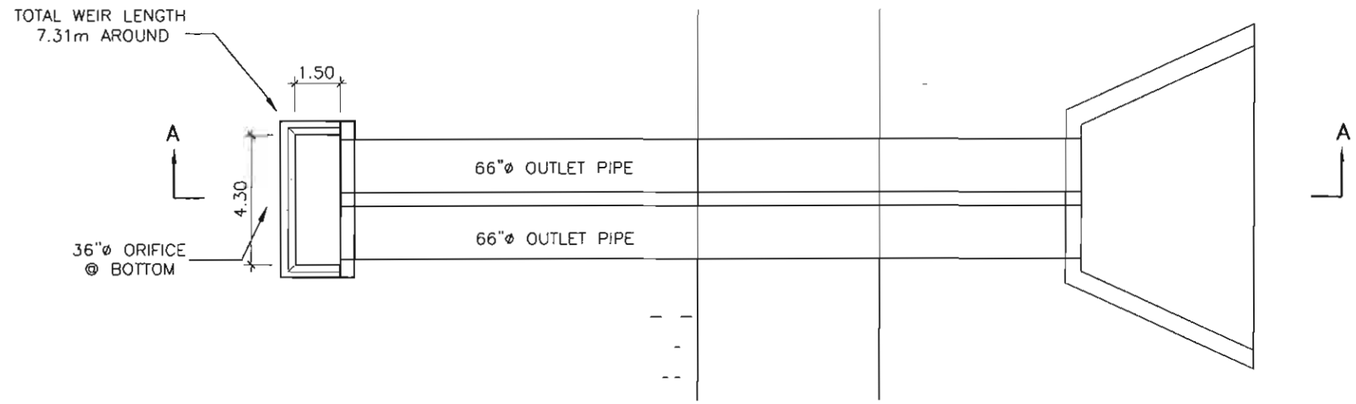
SECTION A-A
NTS

OUTLET STRUCTURE

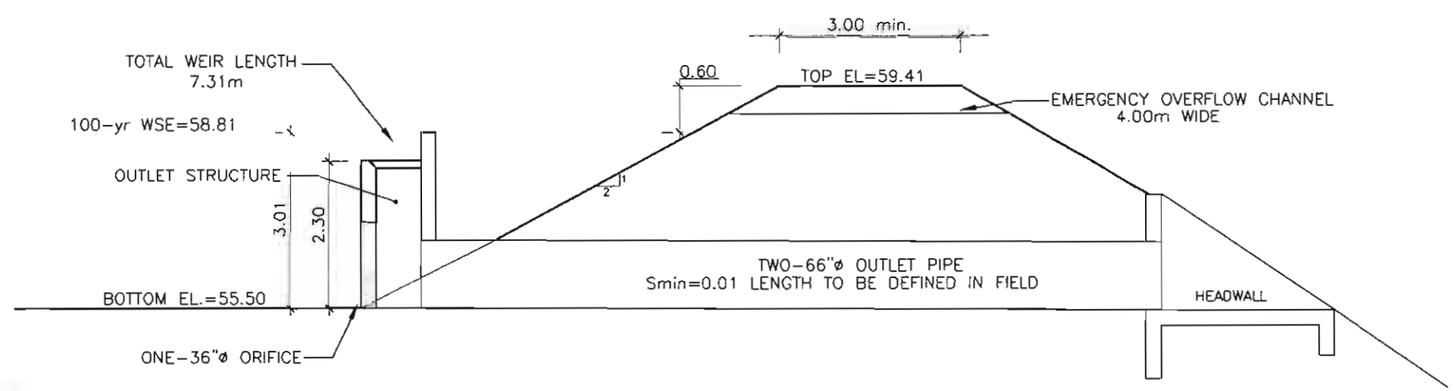
H/H STUDY PALACIOS DE GURABO	CA Engineering
Scale: NTS	
Schematics of the Detention Pond 2	Figure 10



POND3 PLAN VIEW
NTS



PLAN VIEW
NTS



SECTION A–A
NTS

OUTLET STRUCTURE

H/H STUDY PALACIOS DE GURABO	CA Engineering
Scale: NTS	
Schematics of the Detention Pond 3	Figure 11

CA Engineering

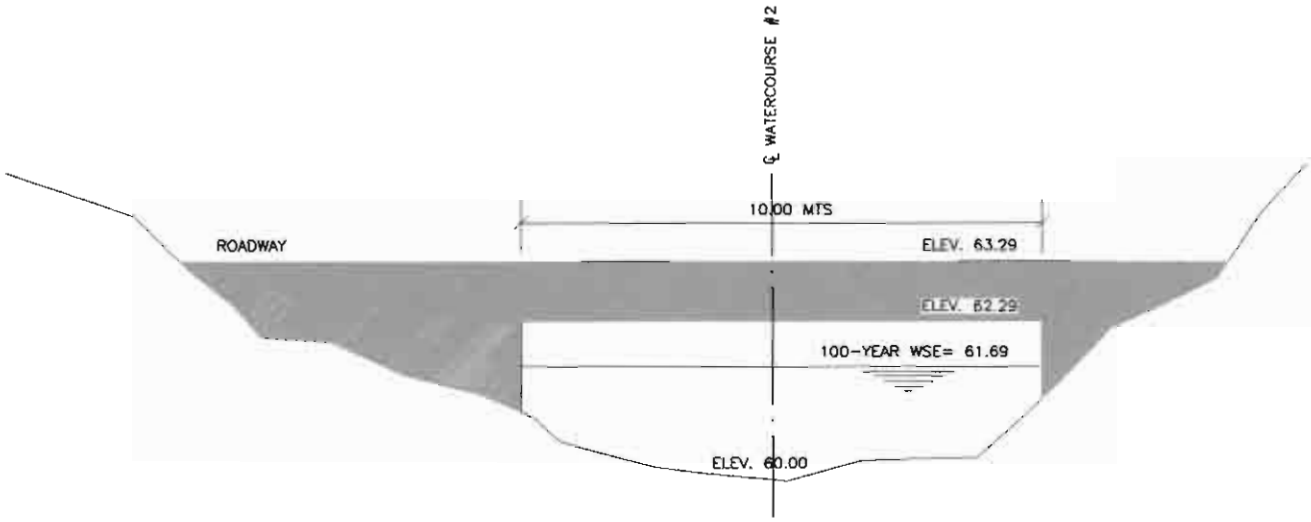
Scale: 1:7,500

H/H STUDY - PALACIOS DE GURABO, GURABO, PR

Figure 12

Location of Cross Sections

FIG.12



CA Engineering	H/H STUDY - PALACIOS DE GURABO, GURABO, P.R.	Scale: NTS
	Figure 13 PROPOSED BRIDGE AT WATERCOURSE #2	

CA Engineering

Scale: 1:7,500

H/H STUDY - PALACIOS DE GURABO, GURABO, PR

Figure 14

100-year Flood Footprint

FIG.14

APPENDIXES

APPENDIX A

HYDROLOGIC PARAMETERS ESTIMATION

APPENDIX A

HYDROLOGIC PARAMETERS ESTIMATION

Project: Palacios de Gurabo
Gurabo, PR

EXISTING CONDITION

AREA P1a

Soil	HSG	Curve Number	Area (acre)
NaE2, NaD2	C	83	11.65
Total (acres)			11.65
Total (km2)			0.047
Total (mi2)			0.0182
Weighted CN			83.0

AREA P1b

Soil	HSG	Curve Number	Area (acre)
NaE2, NaD2	C	83	32.57
RoC2	D	87	2.60
Total (acres)			35.17
Total (km2)			0.142
Total (mi2)			0.0550
Weighted CN			83.3

AREA P1c

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	8.13
NaE2	C	83	0.08
Cs, RoC2	D	87	7.14
Total (acres)			15.35
Total (km2)			0.062
Total (mi2)			0.0240
Weighted CN			80.6

AREA P1d

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	0.07
NaE2	C	83	3.51
Cs, RoC2, MxE	D	87	2.99
Total (acres)			6.57
Total (km2)			0.027
Total (mi2)			0.0103
Weighted CN			84.7

AREA P3

Soil	HSG	Curve Number	Area (acre)
NaD2, NaE2, NaF2	C	83	13.34
CaF, CaE, SaF, MxE, MxD	D	87	55.49
Total (acres)			68.83
Total (km2)			0.279
Total (mi2)			0.1075
Weighted CN			86.2

AREA P4a

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	3.72
NaD2, NaE2, NaF2	C	83	14.06
CaF, CaE, MxD, RoC2	D	87	10.80
Total (acres)			28.58
Total (km2)			0.116
Total (mi2)			0.0447
Weighted CN			83.5

AREA P4bc

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	49.22
NaD2, NaE2	C	83	19.55
RoC2	D	87	11.14
Total (acres)			79.91
Total (km2)			0.323
Total (mi2)			0.1249
Weighted CN			78.4

AREA E1

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	22.24
NaD2, NaE2	C	83	37.75
CaF, MxE, MaC, Cs, RoC2	D	87	251.61
Total (acres)			311.60
Total (km2)			1.261
Total (mi2)			0.4869
Weighted CN			85.7

AREA E2

Soil	HSG	Curve Number	Area (acre)
NaD2	C	83	0.96
CaF, MxE, MaC, RoC2	D	87	165.98
Total (acres)			166.94
Total (km2)			0.676
Total (mi2)			0.2608
Weighted CN			87.0

AREA E3

Soil	HSG	Curve Number	Area (acre)
NaD2, NaE2	C	83	1.40
CaF, MxE, SaF	D	87	77.28
Total (acres)			78.68
Total (km2)			0.318
Total (mi2)			0.1229
Weighted CN			86.9

AREA E4

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	3.72
NaD2, NaE2	C	83	6.19
CaF, CaE, MxD, RoC2	D	87	22.81
Total (acres)			32.72
Total (km2)			0.132
Total (mi2)			0.0511
Weighted CN			84.9

Project: Palacios de Gurabo
Gurabo, PR

PROPOSED CONDITION

AREA P1ab

Soil	HSG	Curve Number	Area (acre)
Urban	-	93	46.82
Total (acres)			46.82
Total (km2)			0.189
Total (mi2)			0.0732
Weighted CN			93.0

AREA P1c

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	0.53
NaE2	C	83	0.08
Cs, RoC2	D	87	5.88
Total (acres)			6.49
Total (km2)			0.026
Total (mi2)			0.0101
Weighted CN			86.0

AREA P1d

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	0.07
NaE2	C	83	3.51
Cs, RoC2, MxE	D	87	2.99
Total (acres)			6.57
Total (km2)			0.027
Total (mi2)			0.0103
Weighted CN			84.7

AREA P3

Soil	HSG	Curve Number	Area (acre)
Urban	-	93	37.41
NaD2, NaE2	C	83	3.45
CaF, CaE, SaF, MxE	D	87	38.50
Total (acres)			79.36
Total (km2)			0.321
Total (mi2)			0.1240
Weighted CN			89.7

AREA P4a

Soil	HSG	Curve Number	Area (acre)
Urban	-	93	10.76
AaC	B	75	0.85
NaD2, NaE2	C	83	2.84
Cs, MxD, RoC2	D	87	3.60
Total (acres)			18.05
Total (km2)			0.073
Total (mi2)			0.0282
Weighted CN			89.4

AREA P4b

Soil	HSG	Curve Number	Area (acre)
Urban	-	93	58.72
Total (acres)			58.72
Total (km2)			0.238
Total (mi2)			0.0918
Weighted CN			93.0

AREA P4c

Soil	HSG	Curve Number	Area (acre)
Urban	-	93	30.05
Total (acres)			30.05
Total (km2)			0.122
Total (mi2)			0.0477
Weighted CN			93.0

AREA E1

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	22.24
NaD2, NaE2	C	83	37.75
CaF, MxE, MaC, Cs, RoC2	D	87	251.61
Total (acres)			311.60
Total (km2)			1.261
Total (mi2)			0.4869
Weighted CN			95.7

AREA E2

Soil	HSG	Curve Number	Area (acre)
NaD2	C	83	0.96
CaF, MxE, MaC, RoC2	D	87	165.98
Total (acres)			166.94
Total (km2)			0.676
Total (mi2)			0.2608
Weighted CN			87.0

AREA E3

Soil	HSG	Curve Number	Area (acre)
NaD2, NaE2	C	83	1.40
CaF, MxE, SaF	D	87	77.28
Total (acres)			78.68
Total (km2)			0.318
Total (mi2)			0.1229
Weighted CN			86.9

AREA E4

Soil	HSG	Curve Number	Area (acre)
AaC	B	75	3.72
NaD2, NaE2	C	83	6.19
CaF, CaE, MxD, RoC2	D	87	22.81
Total (acres)			32.72
Total (km2)			0.132
Total (mi2)			0.0511
Weighted CN			84.9

AREA P3.1

Soil	HSG	Curve Number	Area (acre)
CaF, SaF	D	87	15.62
Total (acres)			15.62
Total (km2)			0.063
Total (mi2)			0.0244
Weighted CN			87.0

Project: Palacios de Gurabo, Gurabo, PR
LAG TIME COMPUTATIONS - SCS

SCS's Method

Lag = {L^0.8 * (S+1)^0.7} / (1900 * Y^0.5)

	AREA	Length		High Elevation	Low Elevation	DH		Slope	[L^0.8]	[CN]	[S]	[(S+1)^0.7]	[Y^0.5]	Lag
		[m]	[ft]	[m]	[m]	[m]	[ft]							(hrs)
Existing	P1a	167.0	548	95.00	59.00	36.0	118.1	0.2156	155.2309	83.0	2.0482	2.1819	4.6429	0.04
	P1b	769.0	2,523	95.00	50.00	45.0	147.6	0.0585	526.6791	83.3	2.0048	2.1601	2.4190	0.25
	P1c	682.0	2,238	80.00	49.00	31.0	101.7	0.0455	478.4455	80.6	2.4069	2.3586	2.1320	0.28
	P1d	184.0	604	110.00	58.00	52.0	170.6	0.2826	167.7487	84.7	1.8064	2.0592	5.3161	0.03
	P3	920.0	3,019	200.00	70.00	130.0	426.5	0.1413	607.9043	86.2	1.6009	1.9525	3.7590	0.17
	P4a	187.0	614	131.00	70.00	61.0	200.1	0.3262	169.9332	83.5	1.9760	2.1456	5.7114	0.03
	P4bc	920.0	3,019	88.00	45.00	43.0	141.1	0.0467	607.9043	78.6	2.7226	2.5096	2.1619	0.37
	E1	2,439.0	8,002	351.00	55.00	296.0	971.2	0.1214	1326.0943	85.7	1.6686	1.9879	3.4837	0.40
	E2	1,718.0	5,637	370.00	65.00	305.0	1,000.7	0.1775	1001.8980	87.0	1.4943	1.8961	4.2135	0.24
	E3	1,470.0	4,823	380.00	65.00	315.0	1,033.5	0.2143	884.4206	86.9	1.5075	1.9031	4.6291	0.19
	E4	652.0	2,139	190.00	68.00	122.0	400.3	0.1871	461.5333	84.9	1.7786	2.0449	4.3257	0.11
Proposed	P1ab	832.0	2,730	80.00	55.00	25.0	82.0	0.0300	560.9235	93.0	0.7527	1.4811	1.7334	0.25
	P1c	580.0	1,903	58.00	49.00	9.0	29.5	0.0155	420.2884	86.0	1.6279	1.9666	1.2457	0.35
	P1d	184.0	604	110.00	58.00	52.0	170.6	0.2826	167.7487	84.7	1.8064	2.0592	5.3161	0.03
	P3	712.0	2,336	95.00	70.00	25.0	82.0	0.0351	495.2095	89.7	1.1483	1.7079	1.8738	0.24
	P4a	315.0	1,034	90.00	80.00	10.0	32.8	0.0317	257.9012	89.4	1.1857	1.7287	1.7817	0.13
	P4b	1,100.0	3,609	80.00	65.00	15.0	49.2	0.0136	701.3247	93.0	0.7527	1.4811	1.1677	0.47
	P4c	1,075.0	3,527	80.00	55.00	25.0	82.0	0.0233	688.5441	93.0	0.7527	1.4811	1.5250	0.35
	E1	2,439.0	8,002	351.00	55.00	296.0	971.2	0.1214	1326.0943	85.7	1.6686	1.9879	3.4837	0.40
	E2	1,718.0	5,637	370.00	65.00	305.0	1,000.7	0.1775	1001.8980	87.0	1.4943	1.8961	4.2135	0.24
	E3	1,470.0	4,823	380.00	65.00	315.0	1,033.5	0.2143	884.4206	86.9	1.5075	1.9031	4.6291	0.19
	E4	652.0	2,139	190.00	68.00	122.0	400.3	0.1871	461.5333	84.9	1.7786	2.0449	4.3257	0.11
	P3.1	351.0	1,152	215.00	90.00	125.0	410.1	0.3561	281.2229	87.0	1.4943	1.8961	5.9676	0.05

APPENDIX B

HEC-1 RESULTS FOR EXISTING CONDITION

```
*                                        *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*              JUN   1998                *
*           VERSION 4.1                  *
* RGMHEC1000                HEC-1.COM   *
* RUN DATE   01JUL05  TIME  16:10:51     *
*                                        *
******************************************
```

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

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

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

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

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

  1           ID        HYDROLOGIC ANALYSIS
  2           ID        PROJECT: PALACIOS DE GURABO, GURABO, P.R.
  3           ID        BY: CA ENGINEERING - JUNE, 2005
  4           ID        TYPE II DISTRIBUTION
  5           ID        FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
  6           ID        EXISTING CONDITION
  7           IT       5                    289
  8           IO       2
  9           JR    PREC    0.41    0.67    0.82    0.92    1.00

 10           KK     P1a
 11           BA  0.0182
 12           LS       0    83.00
 13           UD    0.04
 14           IN      15
 15           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 16           PB    11.9
 17           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 18           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 19           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 20           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 21           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 22           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 23           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 24           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 25           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 26           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 27           KK     P1b
 28           BA   0.055
 29           LS       0    83.3
 30           UD    0.25
 31           IN      15
 32           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 33           PB    11.9
 34           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 35           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 36           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 37           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 38           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 39           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 40           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 41           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 42           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 43           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 44           KK    COMB
 45           HC       2

 46           KK      P1
 47           BA  0.1075
 48           LS       0    84.2
 49           UD    0.17
 50           IN      15
 51           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
```



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

 52           PB    11.9
 53           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 54           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 55           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 56           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 57           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 58           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 59           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 60           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 61           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 62           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 63           KK      P2
 64           BA  0.1229
 65           LS       0    86.9
 66           UD    0.17
 67           IN      15
 68           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
```

```
 69          PB     11.9
 70          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 71          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 72          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 73          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 74          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 75          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 76          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 77          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 78          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 79          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 80          KK     COMB
 81          HC        2

 82          KK      E1c
 83          BA   0.0240
 84          LS        0     80.6
 85          UD     0.28
 86          IN       15
 87          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 88          PB     11.9
 89          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 90          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 91          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 92          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 93          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 94          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 95          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 96          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 97          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 98          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000
```



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

 99          KK      E1a
100          BA   0.0103
101          LS        0     84.7
102          UD     0.07
103          IN       15
104          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
105          PB     11.9
106          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
107          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
108          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
109          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
110          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
111          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
112          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
113          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
114          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
115          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

116          KK       E1
117          BA   0.4869
118          LS        0     85.7
119          UD     0.40
120          IN       15
121          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
122          PB     11.9
123          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
124          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
125          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
126          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
127          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
128          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
129          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
130          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
131          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
132          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

133          KK       E2
134          BA   0.2608
135          LS        0     87
136          UD     0.24
137          IN       15
138          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
139          PB     11.9
140          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
```

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 141          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 142          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 143          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 144          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 145          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 146          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 147          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 148          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 149          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000
1                                          HEC-1 INPUT                                                PAGE  4

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


 150          KK    COMB
 151          HC       6

 152          KK     P4a
 153          BA  0.0447
 154          LS       0     83.5
 155          UD    0.03
 156          IN      15
 157          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 158          PB    11.9
 159          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 160          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 161          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 162          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 163          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 164          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 165          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 166          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 167          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 168          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 169          KK    P4bc
 170          BA  0.1249
 171          LS       0     78.6
 172          UD    0.17
 173          IN      15
 174          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 175          PB    11.9
 176          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 177          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 178          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 179          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 180          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 181          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 182          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 183          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 184          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 185          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 186          KK      E4
 187          BA  0.0511
 188          LS       0     84.9
 189          UD    0.11
 190          IN      15
 191          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 192          PB    11.9
 193          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 194          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 195          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 196          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 197          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 198          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 199          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 200          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
1                                          HEC-1 INPUT                                                PAGE  5

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

 201          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 202          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 203          KK    COMB
 204          HC       3
 205          ZZ
1*************************************                                  ************************************
*                                   *                                  *                                  *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1) *                                  *   U.S. ARMY CORPS OF ENGINEERS   *
```

```
*                JUN   1998                *
*             VERSION 4.1                  *
*  RGMHEC2000                HEC-1.COM    *
*  RUN DATE   01JUL05  TIME  16:10:51     *
*                                         *
*******************************************
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*   HYDROLOGIC ENGINEERING CENTER   *
*         609 SECOND STREET         *
*      DAVIS, CALIFORNIA 95616      *
*          (916) 756-1104           *
*                                   *
*************************************
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                    HYDROLOGIC ANALYSIS
                    PROJECT: PALACIOS DE GURABO, GURABO, P.R.
                    BY: CA ENGINEERING - JUNE, 2005
                    TYPE II DISTRIBUTION
                    FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
                    EXISTING CONDITION

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

  IT        HYDROGRAPH TIME DATA
                NMIN           5  MINUTES IN COMPUTATION INTERVAL
                IDATE      1   0  STARTING DATE
                ITIME       0000  STARTING TIME
                   NQ        289  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      2   0  ENDING DATE
              NDTIME       0000  ENDING TIME
              ICENT          19  CENTURY MARK

          COMPUTATION INTERVAL     .08 HOURS
               TOTAL TIME BASE   24.00 HOURS

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

  JP        MULTI-PLAN OPTION
                NPLAN          1  NUMBER OF PLANS

  JR        MULTI-RATIO OPTION
            RATIOS OF PRECIPITATION
             .41       .67       .82       .92      1.00


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

          *************
          *           *
 10 KK    *    Pla    *
          *           *
          *************
                        RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 14 IN      TIME DATA FOR INPUT TIME SERIES
                JXMIN         15  TIME INTERVAL IN MINUTES
              JXDATE      1   0  STARTING DATE
              JXTIME          0  STARTING TIME

         SUBBASIN RUNOFF DATA

 11 BA      SUBBASIN CHARACTERISTICS
                TAREA        .02  SUBBASIN AREA

            PRECIPITATION DATA

 16 PB          STORM      11.50  BASIN TOTAL PRECIPITATION

 17 PI        INCREMENTAL PRECIPITATION PATTERN
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
               .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
```

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

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-12 LS          SCS LOSS RATE
                     STRTL        .41  INITIAL ABSTRACTION
                    CRVNBR      88.00  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

 13 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        .04  LAG
                                                                  ...
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                                                        UNIT HYDROGRAPH
                                                     5 END-OF-PERIOD ORDINATES
            105.      29.       6.       1.       0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.15, TOTAL EXCESS =    9.75

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)      (HR)
                          (CFS)
+    145.    12.00                   15.         5.          5.          3.
                         (INCHES)   7.478       9.746       9.746       9.746
                          (AC-FT)      7.          9.          9.          9.

                         CUMULATIVE AREA =     .02 SQ MI

     ...          ...          ...          ...          ...
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                         HYDROGRAPH AT STATION      91a
                           FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.81, TOTAL EXCESS =    3.06

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)      (HR)
                          (CFS)
+     50.    12.00                    5.         1.          1.          1.
                         (INCHES)   2.470       3.062       3.062       3.062
                          (AC-FT)      2.          3.          3.          3.

                         CUMULATIVE AREA =     .02 SQ MI

     ...          ...          ...          ...          ...

                         HYDROGRAPH AT STATION      91a
                           FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    2.02, TOTAL EXCESS =    5.95

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
```

```
+   (CFS)        (HR)
                          (CFS)
+     92.       12.00                  9.          3.          3.          3.
                         (INCHES)    4.704       5.947       5.947       5.947
                          (AC-FT)      5.          6.          6.          6.

                         CUMULATIVE AREA =     .02 SQ MI

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

                          HYDROGRAPH AT STATION      P1a
                            FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =     9.76, TOTAL LOSS =    2.09, TOTAL EXCESS =    7.67

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                          (CFS)
+    116.       12.00                 12.          4.          4.          4.
                         (INCHES)    6.008       7.663       7.663       7.663
                          (AC-FT)      6.          7.          7.          7.

                         CUMULATIVE AREA =     .02 SQ MI

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

                          HYDROGRAPH AT STATION      P1a
                            FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =    10.45, TOTAL LOSS =    2.12, TOTAL EXCESS =    8.82

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                          (CFS)
+    132.       12.00                 13.          4.          4.          4.
                         (INCHES)    6.880       8.818       8.818       8.[illegible]
                          (AC-FT)      7.          9.          9.          9.

                         CUMULATIVE AREA =     .02 SQ MI

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

                          HYDROGRAPH AT STATION      P1a
                            FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =    11.90, TOTAL LOSS =    2.15, TOTAL EXCESS =    9.75

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                          (CFS)
+    145.       12.00                 15.          5.          5.          5.
                         (INCHES)    7.578       9.746       9.746       9.746
                          (AC-FT)      7.          9.          9.          9.

                         CUMULATIVE AREA =     .02 SQ MI


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

            *************
            *           *
 27 HR      *     P1b   *
            *           *
            *************
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 31 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          45  TIME INTERVAL IN MINUTES
                     JXDATE       1    0  STARTING DATE
                     JXTIME            0  STARTING TIME

              SUBBASIN RUNOFF DATA
```

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28 BA          SUBBASIN CHARACTERISTICS
                    TAREA          .05  SUBBASIN AREA

               PRECIPITATION DATA

33 PB               STORM       11.90  BASIN TOTAL PRECIPITATION

34 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .01        .00        .01
                    .01        .01        .01        .01        .01        .01        .01        .01        .03        .03
                    .03        .09        .09        .09        .01        .01        .01        .01        .01        .01
                    .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00

29 LS          SCS LOSS RATE
                    STRTL          .40  INITIAL ABSTRACTION
                   CRVNBR        83.30  CURVE NUMBER
                    RTIMP          .00  PERCENT IMPERVIOUS AREA

36 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .25  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                            17 END-OF-PERIOD ORDINATES
                 16.        55.        88.        88.        69.        41.        26.        17.        10.         6.
                  4.         3.         2.         1.         1.         0.         0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.11, TOTAL EXCESS =    9.79

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     294.      12.17                45.         14.         14.         14.
                                 (INCHES)      7.600       9.755       9.755       9.755
                                  (AC-FT)        22.         29.         29.         29.

                                 CUMULATIVE AREA =     .05 SQ MI

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

                                 HYDROGRAPH AT STATION       P1b
                                   FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.79, TOTAL EXCESS =    3.09

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+      98.      12.17                15.          5.          5.          5.
                                 (INCHES)      2.488       3.079       3.079       3.079
                                  (AC-FT)         7.          9.          9.          9.
```

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION P1b
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = 1.99, TOTAL EXCESS = 5.99

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
- 184.	12.17		28.	9.	9.	9.
		(INCHES)	4.726	5.963	5.963	5.963
		(AC-FT)	14.	17.	17.	17.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION P1b
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 2.05, TOTAL EXCESS = 7.71

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
- (CFS)	(HR)					
		(CFS)				
- 234.	12.17		36.	11.	11.	11.
		(INCHES)	6.031	7.676	7.676	7.676
		(AC-FT)	18.	23.	23.	23.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION P1b
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 2.09, TOTAL EXCESS = 8.86

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
- (CFS)	(HR)					
		(CFS)				
- 267.	12.17		41.	13.	13.	13.
		(INCHES)	6.902	8.829	8.829	8.829
		(AC-FT)	20.	26.	26.	26.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION P1b
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 11.90, TOTAL LOSS = 2.11, TOTAL EXCESS = 9.79

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
- (CFS)	(HR)					
		(CFS)				
- 294.	12.17		45.	14.	14.	14.
		(INCHES)	7.600	9.755	9.755	9.755
		(AC-FT)	22.	29.	29.	29.

CUMULATIVE AREA = .05 SQ MI

*** ***

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                ************
                *          *
   44 KK        *   COMB   *
                *          *
                ************

   45 HC          HYDROGRAPH COMBINATION
                     ICOMP        2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

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

                        HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .41

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    125.      12.00                20.           6.           6.           6.
                            (INCHES)      2.483        3.075        3.075        3.075
                              (AC-FT)       10.          12.          12.          12.

                        CUMULATIVE AREA =     .07 SQ MI

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

                        HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .67

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    239.      12.00                37.          12.          12.          12.
                            (INCHES)      4.720        5.959        5.959        5.959
                              (AC-FT)       18.          23.          23.          23.

                        CUMULATIVE AREA =     .07 SQ MI

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

                        HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .82

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    304.      12.00                47.          15.          15.          15.
                            (INCHES)      6.025        7.673        7.673        7.673
                              (AC-FT)       24.          30.          30.          30.

                        CUMULATIVE AREA =     .07 SQ MI

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

                        HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .92

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    340.      12.00                54.          17.          17.          17.
                            (INCHES)      6.806        8.826        8.826        8.826
                              (AC-FT)       27.          34.          34.          34.

                        CUMULATIVE AREA =     .07 SQ MI

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

                        HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

```
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                              (CFS)
+    383.      12.00                     60.          19.          19.          19.
                            (INCHES)   7.594        9.753        9.753        9.753
                             (AC-FT)     30.          38.          38.          38.

                          CUMULATIVE AREA =      .07 SQ MI
```

*** ***

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            **************
            *            *
  46 KK     *     P3     *
            *            *
            **************
                                RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

  50 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1    0  STARTING DATE
                     JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

  47 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .11  SUBBASIN AREA

                 PRECIPITATION DATA

  52 PB                STORM       11.90  BASIN TOTAL PRECIPITATION

  53 PI            INCREMENTAL PRECIPITATION PATTERN
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                      .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                      .01        .01        .01        .01        .01        .01        .01        .01        .03        .03
                      .03        .03        .03        .03        .01        .01        .01        .01        .01        .01
                      .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
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                      .00        .00        .00        .00        .00        .00        .00        .00
  48 LS          SCS LOSS RATE
                      STRTL         .32  INITIAL ABSTRACTION
                     CRVNBR       86.20  CURVE NUMBER
                      RTIMP         .00  PERCENT IMPERVIOUS AREA

  49 UD          SCS DIMENSIONLESS UNITGRAPH
                       TLAG         .17  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            12 END-OF-PERIOD ORDINATES
                 1.       226.       232.       146.        73.        39.        21.        11.         6.         3.
                 2.         1.
```

```
TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.73, TOTAL EXCESS =   10.17

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    695.     12.08                 90.         29.         29.         29.
                                (INCHES)      7.625      10.149      10.149      10.149
                                 (AC-FT)       45.         58.         58.         58.

                                CUMULATIVE AREA =     .11 SQ MI

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

                                HYDROGRAPH AT STATION        P3
                                  FOR PLAN 1, RATIO =  .41

TOTAL RAINFALL =   4.88, TOTAL LOSS =    1.51, TOTAL EXCESS =    3.37

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    245.     12.08                 31.         10.         10.         10.
                                (INCHES)      2.693       3.365       3.365       3.365
                                 (AC-FT)       15.         19.         19.         19.

                                CUMULATIVE AREA =     .11 SQ MI

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

                                HYDROGRAPH AT STATION        P3
                                  FOR PLAN 1, RATIO =  .67

TOTAL RAINFALL =   7.97, TOTAL LOSS =    1.64, TOTAL EXCESS =    6.33

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    445.     12.08                 57.         18.         18.         18.
                                (INCHES)      4.949       6.313       6.313       6.313
                                 (AC-FT)       28.         36.         36.         36.

                                CUMULATIVE AREA =     .11 SQ MI

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

                                HYDROGRAPH AT STATION        P3
                                  FOR PLAN 1, RATIO =  .82

TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.69, TOTAL EXCESS =    8.07

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    559.     12.08                 72.         23.         23.         23.
                                (INCHES)      6.257       8.049       8.049       8.049
                                 (AC-FT)       36.         46.         46.         46.

                                CUMULATIVE AREA =     .11 SQ MI

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

                                HYDROGRAPH AT STATION        P3
                                  FOR PLAN 1, RATIO =  .92

TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.71, TOTAL EXCESS =    9.24

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    635.     12.08                 82.         27.         27.         27.
                                (INCHES)      7.129       9.214       9.214       9.214
```

```
                    (AC-FT)        41.          53.          53.          53.

                    CUMULATIVE AREA =      .11 SQ MI

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

                     HYDROGRAPH AT STATION        P3
                       FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.73, TOTAL EXCESS =   10.17

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+     695.     12.08                 90.          29.          29.          29.
                                (INCHES)       7.825       10.149       10.149       10.149
                                 (AC-FT)        45.          58.          58.          58.

                    CUMULATIVE AREA =      .11 SQ MI


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


          **************
          *            *
 63 KK    *     E3     *
          *            *
          **************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 67 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
               JXDATE       1   9  STARTING DATE
               JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

 64 BA        SUBBASIN CHARACTERISTICS
                TAREA         .12  SUBBASIN AREA

              PRECIPITATION DATA

 69 PB          STORM       11.90  BASIN TOTAL PRECIPITATION

 70 PI        INCREMENTAL PRECIPITATION PATTERN
                .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                .01        .01        .01        .01        .01        .01        .01        .01        .03        .03
                .03        .09        .09        .09        .01        .01        .01        .01        .01        .01
                .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
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                .00        .00        .00        .00        .00        .00        .00        .00
 65 LS        SCS LOSS RATE
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                    STRTL        .30  INITIAL ABSTRACTION
                   CRVNBR      86.90  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

 66 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .19  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                          13 END-OF-PERIOD ORDINATES
              67.     215.     254.     189.     100.      57.      32.      18.      10.       5.
               3.       2.       1.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.64, TOTAL EXCESS =   10.26

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    776.     12.08                 104.         34.         34.         34.
                         (INCHES)  7.675      10.237      10.237      10.237
                          (AC-FT)     92.         67.         67.         67.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION        E3
                           FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.44, TOTAL EXCESS =    3.44

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    276.     12.08                  36.         11.         11.         11.
                         (INCHES)  2.742       3.433       3.433       3.433
                          (AC-FT)     18.         23.         23.         23.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION        E3
                           FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.56, TOTAL EXCESS =    6.41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    498.     12.08                  66.         21.         21.         21.
                         (INCHES)  5.001       6.394       6.394       6.394
                          (AC-FT)     33.         42.         42.         42.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION        E3
                           FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =    1.60, TOTAL EXCESS =    8.16

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    625.     12.08                  83.         27.         27.         27.
                         (INCHES)  6.309       8.134       8.134       8.134
                          (AC-FT)     41.         53.         53.         53.

                         CUMULATIVE AREA =     .12 SQ MI
```

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

                    HYDROGRAPH AT STATION        E3
                      FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =   [illegible], TOTAL LOSS =    1.62, TOTAL EXCESS =    9.33

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     709.      12.[illegible]                 [illegible]5.         31.          31.          31.
                        (INCHES)      7.1[illegible]        9.301        9.301        9.301
                        (AC-FT)        4[illegible].         61.          61.          61.

                       CUMULATIVE AREA =      .12 SQ MI

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

                    HYDROGRAPH AT STATION        E3
                      FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.64, TOTAL EXCESS =   10.26

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     776.      12.08                   104.         34.          34.          34.
                        (INCHES)      7.875       10.237       10.237       10.237
                        (AC-FT)        52.         67.          67.          67.

                       CUMULATIVE AREA =      .12 SQ MI


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


            **************
            *            *
  80 KK     *     COMB   *
            *            *
            **************

  81 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                   ***

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

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .41

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     521.      12.08                    67.         21.          21.          21.
                        (INCHES)      2.719        3.401        3.401        3.401
                        (AC-FT)        33.         42.          42.          42.

                       CUMULATIVE AREA =      .23 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .67

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     943.      12.08                   123.         39.          39.          39.
                        (INCHES)      4.976        6.356        6.356        6.356
                        (AC-FT)        61.         78.          78.          78.
```

```
                    CUMULATIVE AREA =      .23 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    1184.     12.08                156.         50.         50.         50.
                        (INCHES)   6.285      8.095       8.095       8.095
                        (AC-FT)     77.         99.         99.         99.

                    CUMULATIVE AREA =      .23 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .92

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    1344.     12.08                177.         57.         57.         57.
                        (INCHES)   7.156      9.261       9.261       9.261
                        (AC-FT)     88.        114.        114.        114.

                    CUMULATIVE AREA =      .23 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    1471.     12.08                195.         63.         63.         63.
                        (INCHES)   7.852     10.196      10.196      10.196
                        (AC-FT)     96.        125.        125.        125.

                    CUMULATIVE AREA =      .23 SQ MI


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

          *************
          *           *
 82 KK    *    P1c    *
          *           *
          *************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 86 IN        TIME DATA FOR INPUT TIME SERIES
                   JXMIN          15  TIME INTERVAL IN MINUTES
                  JXDATE      1    0  STARTING DATE
                  JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

 83 BA        SUBBASIN CHARACTERISTICS
                   TAREA         .02  SUBBASIN AREA

              PRECIPITATION DATA

 88 PB             STORM       11.90  BASIN TOTAL PRECIPITATION

 89 PI          INCREMENTAL PRECIPITATION PATTERN
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

```
 84 LS          SCS LOSS RATE
                     STRTL        .48  INITIAL ABSTRACTION
                    CRVNBR      80.00  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

 85 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .08  LAG
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...

```
                                                UNIT HYDROGRAPH
                                             19 END-OF-PERIOD ORDINATES
        8.      18.      13.      36.      31.      22.      14.       8.       6.       4.
        3.       2.       1.       1.       0.       0.       0.       0.       0.
```

```
   TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.47, TOTAL EXCESS =    9.43

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    120.     12.17                  19.           6.           6.           5.
                         (INCHES)   7.377        9.389        9.389        9.389
                         (AC-FT)      9.           12.          12.          12.

                         CUMULATIVE AREA =     .02 SQ MI
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                         HYDROGRAPH AT STATION      F16
                           FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.04, TOTAL EXCESS =    3.84

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+     38.     12.17                   9.           2.           2.           2.
                         (INCHES)   2.293        2.827        2.827        2.827
                         (AC-FT)      2.           4.           4.           4.

                         CUMULATIVE AREA =     .02 SQ MI
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... ...

```
                         HYDROGRAPH AT STATION      F16
                           FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    2.20, TOTAL EXCESS =    5.77

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

```
                                        6-HR        24-HR        72-HR      24.00-HR
 (CFS)        (HR)
                                  (CFS)
   74.       12.17                  12.           4.           4.           4.
                              (INCHES)       4.309        5.643        5.643        5.643
                               (AC-FT)          6.           7.           7.           7.

                            CUMULATIVE AREA =      .02 SQ MI

     ...            ...            ...            ...            ***

                          HYDROGRAPH AT STATION      P1c
                            FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.16, TOTAL LOSS =    2.39, TOTAL EXCESS =    7.37

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
 (CFS)        (HR)
                                  (CFS)
   95.       12.17                  15.           5.           5.           5.
                              (INCHES)       5.809        7.332        7.332        7.332
                               (AC-FT)          7.           9.           9.           9.

                            CUMULATIVE AREA =      .02 SQ MI

     ...            ...            ...            ...            ***

                          HYDROGRAPH AT STATION      P1c
                            FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.46, TOTAL LOSS =    2.44, TOTAL EXCESS =    8.51

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
 (CFS)        (HR)
                                  (CFS)
  109.       12.17                  17.           5.           5.           5.
                              (INCHES)       6.479        8.472        8.472        8.472
                               (AC-FT)          9.          11.          11.          11.

                            CUMULATIVE AREA =      .02 SQ MI

     ...            ...            ...            ...            ***

                          HYDROGRAPH AT STATION      P1c
                            FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.00, TOTAL LOSS =    2.47, TOTAL EXCESS =    9.43

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
 (CFS)        (HR)
                                  (CFS)
  120.       12.17                  19.           6.           6.           6.
                              (INCHES)       7.373        9.389        9.389        9.389
                               (AC-FT)          9.          12.          12.          12.

                            CUMULATIVE AREA =      .02 SQ MI


... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...


              *************
              *           *
  99 KK       *    P1H    *
              *           *
              *************
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 105 IN            TIME DATA FOR INPUT TIME SERIES
                        JDMIN          15  TIME INTERVAL IN MINUTES
                       JXDATE       1   9  STARTING DATE
                       JXTIME           0  STARTING TIME
```

SUBBASIN RUNOFF DATA

100 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

105 PB STORM 11.90 BASIN TOTAL PRECIPITATION

106 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.29	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

101 LS SCS LOSS RATE
STRTL .36 INITIAL ABSTRACTION
CRVNBR 84.70 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

102 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .03 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

59. 17. 4. 1. 0.

TOTAL RAINFALL = 11.90, TOTAL LOSS = 1.92, TOTAL EXCESS = 9.98

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 83.	12.00		9.	3.	3.	3.
		(INCHES)	7.714	9.971	9.971	9.971
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .01 SQ MI

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

HYDROGRAPH AT STATION R16
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = 1.65, TOTAL EXCESS = 3.23

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 29.	12.00		3.	1.	1.	1.
		(INCHES)	2.584	3.225	3.225	3.225
		(AC-FT)	1.	2.	2.	2.

```
                    CUMULATIVE AREA =      .01 SQ MI

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

                       HYDROGRAPH AT STATION       P1d
                         FOR PLAN 1, RATIO =   .67

        TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.82, TOTAL EXCESS =    6.15

     PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                            6-HR        24-HR       72-HR     24.00-HR
  +   (CFS)         (HR)
                              (CFS)
  +       53.      12.00                      5.          2.          2.          2.
                            (INCHES)      4.836       6.148       6.148       6.148
                             (AC-FT)         3.          3.          3.          3.

                    CUMULATIVE AREA =      .01 SQ MI

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

                       HYDROGRAPH AT STATION       P1d
                         FOR PLAN 1, RATIO =   .82

        TOTAL RAINFALL =    9.76, TOTAL LOSS =    1.88, TOTAL EXCESS =    7.88

     PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                            6-HR        24-HR       72-HR     24.00-HR
  +   (CFS)         (HR)
                              (CFS)
  +       67.      12.00                      7.          2.          2.          2.
                            (INCHES)      6.143       7.876       7.876       7.876
                             (AC-FT)         3.          4.          4.          4.

                    CUMULATIVE AREA =      .01 SQ MI

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

                       HYDROGRAPH AT STATION       P1d
                         FOR PLAN 1, RATIO =   .92

        TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.90, TOTAL EXCESS =    9.04

     PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                            6-HR        24-HR       72-HR     24.00-HR
  +   (CFS)         (HR)
                              (CFS)
  +       76.      12.00                      8.          3.          3.          3.
                            (INCHES)      7.016       9.038       9.038       9.038
                             (AC-FT)         4.          5.          5.          5.

                    CUMULATIVE AREA =      .01 SQ MI

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

                       HYDROGRAPH AT STATION       P1d
                         FOR PLAN 1, RATIO = 1.00

        TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.92, TOTAL EXCESS =    9.98

     PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                            6-HR        24-HR       72-HR     24.00-HR
  +   (CFS)         (HR)
                              (CFS)
  +       83.      12.00                      9.          3.          3.          3.
                            (INCHES)      7.714       9.971       9.971       9.971
                             (AC-FT)         4.          5.          5.          5.

                    CUMULATIVE AREA =      .01 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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              **************
              *            *
116 KK        *     E1     *
              *            *
              **************
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RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

120 IN   TIME DATA FOR INPUT TIME SERIES
  JXMIN   15   TIME INTERVAL IN MINUTES
  JXDATE   1   0   STARTING DATE
  JXTIME   0   STARTING TIME

SUBBASIN RUNOFF DATA

117 BA   SUBBASIN CHARACTERISTICS
  TAREA   .49   SUBBASIN AREA

PRECIPITATION DATA

122 PB   STORM   11.90   BASIN TOTAL PRECIPITATION

123 PI   INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	[illegible]
.01	.01	.01	.01	.01	.01	.01	.01	.01	[illegible]
.23	.09	.05	.09	.01	.01	.01	.01	.01	[illegible]
.01	.01	.01	.01	.01	.01	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00		

118 LS   SCS LOSS RATE
  STRTL   .33   INITIAL ABSTRACTION
  CRVNBR   95.70   CURVE NUMBER
  RTIMP   .00   PERCENT IMPERVIOUS AREA

119 UD   SCS DIMENSIONLESS UNITGRAPH
  TLAG   .40   LAG

***

UNIT HYDROGRAPH
26 END-OF-PERIOD ORDINATES

49.	151.	317.	465.	530.	517.	449.	358.	240.	180.
135.	100.	73.	54.	39.	28.	21.	16.	12.	9.
6.	5.	4.	3.	2.	1.				

TOTAL RAINFALL = 11.90, TOTAL LOSS = 1.79, TOTAL EXCESS = 10.11

PEAK FLOW	TIME			MAXIMUM AVERAGE FLOW		
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2109.	12.25		408.	132.	132.	132.
		(INCHES)	7.783	10.045	10.045	10.045
		(AC-FT)	203.	261.	261.	261.

CUMULATIVE AREA = .49 SQ MI

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

                    HYDROGRAPH AT STATION        E1
                      FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =   4.88, TOTAL LOSS =    1.55, TOTAL EXCESS =    3.32

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     721.       12.25              139.          43.          43.          43.
                                (INCHES)        2.655        3.300        3.300        3.300
                                  (AC-FT)         69.          86.          86.          86.

                                CUMULATIVE AREA =      .49 SQ MI

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

                    HYDROGRAPH AT STATION        E1
                      FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =   7.97, TOTAL LOSS =    1.70, TOTAL EXCESS =    6.27

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+    1336.       12.25              257.          82.          82.          82.
                                (INCHES)        4.909        6.228        6.228        6.228
                                  (AC-FT)        127.         162.         162.         162.

                                CUMULATIVE AREA =      .49 SQ MI

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

                    HYDROGRAPH AT STATION        E1
                      FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.75, TOTAL EXCESS =    8.01

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+    1689.       12.25              325.         104.         104.         104.
                                (INCHES)        6.215        7.955        7.955        7.955
                                  (AC-FT)        161.         207.         207.         207.

                                CUMULATIVE AREA =      .49 SQ MI

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

                    HYDROGRAPH AT STATION        E1
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.78, TOTAL EXCESS =    9.17

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+    1922.       12.25              371.         119.         119.         119.
                                (INCHES)        7.086        9.114        9.114        9.114
                                  (AC-FT)        184.         237.         237.         237.

                                CUMULATIVE AREA =      .49 SQ MI

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

                    HYDROGRAPH AT STATION        E1
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.79, TOTAL EXCESS =   10.11

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
```

+ (CFS) (HR)

(CFS)

+ 2199.	12.25		408.	132.	132.	132.
		(INCHES)	7.703	10.045	10.045	10.045
		(AC-FT)	202.	261.	261.	261.

CUMULATIVE AREA = .49 SQ MI

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              *************
              *           *
 133 KK       *     E2    *
              *           *
              *************
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RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

137 IN TIME DATA FOR INPUT TIME SERIES

JXMIN		15	TIME INTERVAL IN MINUTES
JXDATE	1	0	STARTING DATE
JXTIME		0	STARTING TIME

SUBBASIN RUNOFF DATA

134 BA SUBBASIN CHARACTERISTICS

TAREA .26 SUBBASIN AREA

PRECIPITATION DATA

139 PB STORM 11.90 BASIN TOTAL PRECIPITATION

140 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

135 LS SCS LOSS RATE

STRTL	.30	INITIAL ABSTRACTION
CRVNBR	87.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

136 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .24 LAG

***

UNIT HYDROGRAPH
16 END-OF-PERIOD ORDINATES

83.	290.	439.	420.	313.	182.	114.	70.	44.	27.
17.	10.	6.	4.	3.	1.				

TOTAL RAINFALL = 11.90, TOTAL LOSS = 1.62, TOTAL EXCESS = 10.28

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1461.	12.08		221.	72.	72.	72.
		(INCHES)	7.882	10.242	10.242	10.242
		(AC-FT)	110.	142.	142.	142.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = 1.43, TOTAL EXCESS = 3.45

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 514.	12.17		77.	24.	24.	24.
		(INCHES)	2.748	3.440	3.440	3.440
		(AC-FT)	38.	48.	48.	48.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = 1.55, TOTAL EXCESS = 6.42

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 934.	12.08		140.	45.	45.	45.
		(INCHES)	5.008	6.400	6.400	6.400
		(AC-FT)	70.	89.	89.	89.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 1.59, TOTAL EXCESS = 8.17

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1175.	12.08		177.	57.	57.	57.
		(INCHES)	6.316	8.140	8.140	8.140
		(AC-FT)	88.	113.	113.	113.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 1.61, TOTAL EXCESS = 9.34

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1338.	12.08		202.	65.	65.	65.
		(INCHES)	7.186	9.306	9.306	9.306
		(AC-FT)	100.	129.	129.	129.

```
                    CUMULATIVE AREA =      .26 SQ MI

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

                    HYDROGRAPH AT STATION        E2
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.62, TOTAL EXCESS =   10.28

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+   1461.      12.00                 221.         72.         72.         72.
                        (INCHES)    7.882      10.242      10.242      10.242
                        (AC-FT)     110.        142.        142.        142.

                    CUMULATIVE AREA =      .26 SQ MI
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                 *************
                 *           *
 150 KK          *   COMB    *
                 *           *
                 *************

 151 HC             HYDROGRAPH COMBINATION
                        JCOMP          6  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                   ...

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

                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+   1762.      12.17                 312.         97.         97.         97.
                        (INCHES)    2.670       3.329       3.329       3.329
                        (AC-FT)     155.        193.        193.        193.

                    CUMULATIVE AREA =     1.09 SQ MI

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

                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO =  .67

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+   3232.      12.17                 576.        183.        183.        183.
                        (INCHES)    4.923       6.265       6.265       6.265
                        (AC-FT)     285.        363.        363.        363.

                    CUMULATIVE AREA =     1.09 SQ MI

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

                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+   4074.      12.17                 727.        233.        233.        233.
                        (INCHES)    6.230       7.996       7.996       7.996
```

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                    (AC-FT)      361.        463.        463.        463.

                    CUMULATIVE AREA =    1.09 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .92

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   4633.     12.17                 928.        267.        267.        267.
                         (INCHES)   7.101       9.157       9.157       9.157
                          (AC-FT)   411.        530.        530.        530.

                    CUMULATIVE AREA =    1.09 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   5079.     12.17                 910.        295.        295.        295.
                         (INCHES)   7.797      10.089      10.089      10.089
                          (AC-FT)   451.        584.        584.        584.

                    CUMULATIVE AREA =    1.09 SQ MI


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


          *************
          *           *
152 KK    *     94a   *
          *           *
          *************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

156 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
               JXDATE     1    0  STARTING DATE
               JXTIME          0  STARTING TIME

          SUBBASIN RUNOFF DATA

153 BA        SUBBASIN CHARACTERISTICS
                TAREA         .04  SUBBASIN AREA

              PRECIPITATION DATA

158 PB          STORM       11.90  BASIN TOTAL PRECIPITATION

159 PI          INCREMENTAL PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
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.00     .00     .00     .00     .00     .00     .00     .00
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154 LS          SCS LOSS RATE
                     STRTL        .40  INITIAL ABSTRACTION
                    CRVNBR      83.50  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

155 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .03  LAG

                                                    ***

                                                 UNIT HYDROGRAPH
                                              5 END-OF-PERIOD ORDINATES
          257.      72.      14.       3.       0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.08, TOTAL EXCESS =    9.82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    357.    12.00                   37.         12.         12.         12.
                                 (INCHES)      7.619       9.812       9.812       9.812
                                  (AC-FT)       18.         23.         23.         23.

                                 CUMULATIVE AREA =     .04 SQ MI

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

                                HYDROGRAPH AT STATION      P4a
                                  FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.77, TOTAL EXCESS =    3.11

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    124.    12.00                   12.          4.          4.          4.
                                 (INCHES)      2.505       3.110       3.110       3.110
                                  (AC-FT)        6.          7.          7.          7.

                                 CUMULATIVE AREA =     .04 SQ MI

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

                                HYDROGRAPH AT STATION      P4a
                                  FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.96, TOTAL EXCESS =    6.01

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                  (CFS)
+    227.    12.00                   23.          7.          7.          7.
                                 (INCHES)      4.743       6.006       6.006       6.006
                                  (AC-FT)       11.         14.         14.         14.

                                 CUMULATIVE AREA =     .04 SQ MI

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

                                HYDROGRAPH AT STATION      P4a
                                  FOR PLAN 1, RATIO =  .82
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    TOTAL RAINFALL =    9.76, TOTAL LOSS =    2.03, TOTAL EXCESS =    7.73

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     286.      12.00                29.           9.           9.           9.
                                 (INCHES)       6.048        7.726        7.726        7.726
                                  (AC-FT)        14.          18.          18.          18.

                                 CUMULATIVE AREA =      .04 SQ MI

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

                          HYDROGRAPH AT STATION       P4a
                            FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =   10.95, TOTAL LOSS =    2.06, TOTAL EXCESS =    8.89

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     325.      12.00                33.          11.          11.          11.
                                 (INCHES)       6.920        8.883        8.883        8.883
                                  (AC-FT)        16.          21.          21.          21.

                                 CUMULATIVE AREA =      .04 SQ MI

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

                          HYDROGRAPH AT STATION       P4a
                            FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.08, TOTAL EXCESS =    9.82

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     357.      12.00                37.          12.          12.          12.
                                 (INCHES)       7.619        9.812        9.812        9.812
                                  (AC-FT)        18.          23.          23.          23.

                                 CUMULATIVE AREA =      .04 SQ MI


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

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169 KK      .     P4bc   .
            .            .
            ..............
                                 RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

173 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE       1   0  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

170 BA          SUBBASIN CHARACTERISTICS
                      TAREA         .12  SUBBASIN AREA

                PRECIPITATION DATA

175 PB                STORM       11.90  BASIN TOTAL PRECIPITATION

176 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                     .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                     .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                     .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                     .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
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.00     .00     .00     .00     .00     .00     .00     .01     .00     .01
.01     .01     .01     .01     .01     .01     .01     .01     .03     .03
.03     .09     .09     .09     .01     .01     .01     .01     .01     .01
.01     .01     .01     .01     .01     .01     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
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.00     .00     .00     .00     .00     .00     .00     .00
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171 LS          SCS LOSS RATE
                     STRTL          .54  INITIAL ABSTRACTION
                    CRVNBR        78.60  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

172 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .37  LAG
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                                                UNIT HYDROGRAPH
                                             24 END-OF-PERIOD ORDINATES
        15.     47.     99.    137.    147.    135.    112.     79.     55.     40.
        29.     21.     15.     11.      8.      6.      4.      3.      2.      1.
         1.      1.      1.      0.

  TOTAL RAINFALL =   11.90, TOTAL LOSS =    2.74, TOTAL EXCESS =    9.16

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR    24.00-HR
+  (CFS)      (HR)
                          (CFS)
+   527.     12.25                 97.          31.          21.          31.
                         (INCHES)  7.184       9.103        9.103        9.103
                         (AC-FT)     48.         61.          61.          61.

                         CUMULATIVE AREA =     .12 SQ MI
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... ...

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                         HYDROGRAPH AT STATION     8406
                           FOR PLAN 1, RATIO =   .41

  TOTAL RAINFALL =    6.88, TOTAL LOSS =    2.22, TOTAL EXCESS =    2.66

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR    24.00-HR
+  (CFS)      (HR)
                          (CFS)
+   156.     12.25                 29.           9.           9.           9.
                         (INCHES)  2.157       2.642        2.642        2.642
                         (AC-FT)     14.         18.          18.          18.

                         CUMULATIVE AREA =     .12 SQ MI
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... ...

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                         HYDROGRAPH AT STATION     8406
                           FOR PLAN 1, RATIO =   .37

  TOTAL RAINFALL =    7.47, TOTAL LOSS =    2.54, TOTAL EXCESS =    3.44

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR    24.00-HR
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+   (CFS)        (HR)
                          (CFS)
+     318.      12.25                  58.          18.          18.          18.
                         (INCHES)     4.343        5.400        5.400        5.400
                          (AC-FT)      29.          36.          36.          36.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION     P4bc
                           FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =    9.76, TOTAL LOSS =    2.65, TOTAL EXCESS =    7.11

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     413.      12.25                  76.          24.          24.          24.
                         (INCHES)     5.836        7.066        7.066        7.066
                          (AC-FT)      38.          47.          47.          47.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION     P4bc
                           FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =   10.95, TOTAL LOSS =    2.70, TOTAL EXCESS =    8.25

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     476.      12.25                  87.          28.          28.          28.
                         (INCHES)     6.503        8.194        8.194        8.194
                          (AC-FT)      43.          55.          55.          55.

                         CUMULATIVE AREA =     .12 SQ MI

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

                         HYDROGRAPH AT STATION     P4bc
                           FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =   11.49, TOTAL LOSS =    2.74, TOTAL EXCESS =    9.16

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+     527.      12.25                  97.          31.          31.          31.
                         (INCHES)     7.199        9.103        9.103        9.103
                          (AC-FT)      49.          61.          61.          61.

                         CUMULATIVE AREA =     .12 SQ MI


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

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 186 KK     .       E4  .
            .           .
            .............
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 190 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                      JXDATE      1   0  STARTING DATE
                      JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA
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187 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .05  SUBBASIN AREA

                PRECIPITATION DATA

192 PB               STORM        11.90  BASIN TOTAL PRECIPITATION

193 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                     .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                     .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                     .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00
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188 LS          SCS LOSS RATE
                     STRTL          .36  INITIAL ABSTRACTION
                    CRVNBR        84.90  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

189 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .11  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                             9 END-OF-PERIOD ORDINATES
                92.      162.      84.       34.       14.       6.        2.        1.        0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.90, TOTAL EXCESS =   10.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    370.     12.00                  42.        14.        14.        14.
                          (INCHES)  7.728     9.988      9.988      9.988
                          (AC-FT)    21.        27.        27.        27.

                          CUMULATIVE AREA =     .05 SQ MI

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

                       HYDROGRAPH AT STATION        E4
                         FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.63, TOTAL EXCESS =    3.25

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    127.     12.00                  14.         4.         4.         4.
                          (INCHES)  2.603     3.241      3.241      3.241
                          (AC-FT)     7.         9.         9.         9.
```

```
                    CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.80, TOTAL EXCESS =    6.18

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     235.     12.00                 27.          8.           8.           8.
                                (INCHES)       4.851        6.165        6.165        6.165
                                 (AC-FT)         13.         17.          17.          17.

                    CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =    1.85, TOTAL EXCESS =    7.91

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     297.     12.00                 34.         11.          11.          11.
                                (INCHES)       6.158        7.894        7.894        7.894
                                 (AC-FT)         17.         22.          22.          22.

                    CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.88, TOTAL EXCESS =    9.07

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     338.     12.00                 39.         12.          12.          12.
                                (INCHES)       7.031        9.056        9.056        9.056
                                 (AC-FT)         19.         25.          25.          25.

                    CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.90, TOTAL EXCESS =   10.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     370.     12.00                 42.         14.          14.          14.
                                (INCHES)       7.728        9.988        9.988        9.988
                                 (AC-FT)         21.         27.          27.          27.

                    CUMULATIVE AREA =     .05 SQ MI

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

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201 KK        *      COMB      *
              *                *
              ****************
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204 HC          HYDROGRAPH COMBINATION
                  ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

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

                      HYDROGRAPH AT STATION     COMB
                        FOR PLAN 1, RATIO =  .41

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     337.      12.00                55.          17.          17.          17.
                              (INCHES)        2.324        2.875        2.875        2.875
                               (AC-FT)          27.          34.          34.          34.

                            CUMULATIVE AREA =      .22 SQ MI

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

                      HYDROGRAPH AT STATION     COMB
                        FOR PLAN 1, RATIO =  .67

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     648.      12.00               108.          34.          34.          34.
                              (INCHES)        4.534        5.700        5.700        5.700
                               (AC-FT)          53.          67.          67.          67.

                            CUMULATIVE AREA =      .22 SQ MI

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

                      HYDROGRAPH AT STATION     COMB
                        FOR PLAN 1, RATIO =  .82

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     829.      12.00               138.          44.          44.          44.
                              (INCHES)        5.832        7.392        7.392        7.392
                               (AC-FT)          69.          87.          87.          87.

                            CUMULATIVE AREA =      .22 SQ MI

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

                      HYDROGRAPH AT STATION     COMB
                        FOR PLAN 1, RATIO =  .92

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     950.      12.00               159.          51.          51.          51.
                              (INCHES)        6.702        8.533        8.533        8.533
                               (AC-FT)          79.         100.         100.         100.

                            CUMULATIVE AREA =      .22 SQ MI

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

                      HYDROGRAPH AT STATION     COMB
                        FOR PLAN 1, RATIO = 1.00

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
```

	(CFS)	(HR)					
+			(CFS)				
+	1046.	12.00		176.	56.	56.	56.
			(INCHES)	7.396	9.451	9.451	9.451
			(AC-FT)	87.	111.	111.	111.

CUMULATIVE AREA = .22 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .41	RATIO 2 .67	RATIO 3 .82	RATIO 4 .92	RATIO 5 1.00
HYDROGRAPH AT +	P1a	.02	1	FLOW	50.	92.	116.	132.	145.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	P1b	.05	1	FLOW	98.	184.	234.	267.	294.
				TIME	12.17	12.17	12.17	12.17	12.17
2 COMBINED AT +	COMB	.07	1	FLOW	125.	239.	304.	348.	383.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	P3	.11	1	FLOW	245.	445.	559.	625.	695.
				TIME	12.08	12.08	12.08	12.08	12.08
HYDROGRAPH AT +	E3	.12	1	FLOW	276.	498.	625.	709.	776.
				TIME	12.08	12.08	12.08	12.08	12.08
2 COMBINED AT +	COMB	.23	1	FLOW	521.	943.	1184.	1344.	1471.
				TIME	12.08	12.08	12.08	12.08	12.08
HYDROGRAPH AT +	P1c	.02	1	FLOW	38.	74.	95.	109.	120.
				TIME	12.17	12.17	12.17	12.17	12.17
HYDROGRAPH AT +	P1d	.01	1	FLOW	29.	53.	67.	76.	83.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	E1	.49	1	FLOW	721.	1336.	1689.	1922.	2109.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT +	E2	.26	1	FLOW	514.	934.	1175.	1334.	1461.
				TIME	12.17	12.08	12.08	12.08	12.08
6 COMBINED AT +	COMB	1.08	1	FLOW	1762.	3232.	4074.	4633.	5079.
				TIME	12.17	12.17	12.17	12.17	12.17
HYDROGRAPH AT +	P4a	.04	1	FLOW	124.	227.	286.	325.	357.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	P4bc	.12	1	FLOW	156.	318.	413.	476.	527.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT +	E4	.05	1	FLOW	127.	235.	297.	338.	370.
				TIME	12.00	12.00	12.00	12.00	12.00
3 COMBINED AT +	COMB	.22	1	FLOW	337.	648.	829.	950.	1046.
				TIME	12.00	12.00	12.00	12.00	12.00

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

APPENDIX C

HEC-1 RESULTS FOR PROPOSED CONDITION

```
*                                        *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*            JUN   1998                  *
*         VERSION 4.1                    *
* RGMHEC2000                HEC-1.COM    *
* RUN DATE   01JUL05  TIME  10:11:52     *
*                                        *
******************************************
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*                                        *
*    U.S. ARMY CORPS OF ENGINEERS        *
*    HYDROLOGIC ENGINEERING CENTER       *
*          609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616          *
*           (916) 756-1104               *
*                                        *
******************************************
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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
```

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        HYDROLOGIC ANALYSIS
  2           ID        PROJECT: PALACIOS DE GURABO, GURABO, P.R.
  3           ID        BY: CA ENGINEERING - JUNE, 2005
  4           ID        TYPE II DISTRIBUTION
  5           ID        FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
  6           ID        PROPOSED CONDITION
  7           IT       5                    289
  8           IO       3
  9           JR    PREC    0.41    0.67    0.82    0.92    1.00

 10           KK    P100
 11           BA  0.0732
 12           LS       0      93
 13           UD    0.25
 14           IN      15
 15           KM          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 16           PB    11.4
 17           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 18           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 19           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 20           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 21           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 22           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 23           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 24           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 25           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 26           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 27           KK      P3
 28           BA  0.1240
 29           LS       0      89.7
 30           UD    0.24
 31           IN      15
 32           KM          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 33           PB    11.4
 34           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 35           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 36           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 37           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 38           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 39           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 40           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 41           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 42           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 43           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 44           KK      E3
 45           BA  0.1224
 46           LS       0      86.3
 47           UD    0.19
 48           IN      15
 49           KM          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 50           PB    11.4
 51           PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 52           PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 53           PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 54           PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 55           PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 56           PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 57           PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 58           PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 59           PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 60           PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 61           KK    COMB
 62           HC       2

 63           KK     P10
 64           BA  0.0101
 65           LS       0      34
 66           UD    0.35
 67           IN      15
 68           KM          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
```

```
 69          PB    11.9
 70          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 71          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 72          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 73          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 74          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 75          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 76          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 77          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 78          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 79          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 80          KK     F1d
 81          BA   0.0107
 82          LS       0     84.7
 83          UD    0.03
 84          IN      15
 85          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 86          PB    11.9
 87          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 88          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 89          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 90          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 91          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 92          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 93          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 94          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 95          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 96          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 97          KK      E1
 98          BA   0.4969
 99          LS       0     85.7
100          UD    0.40
101          IN      15
102          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
103          PB    11.9
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HEC-1 INPUT

PAGE

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

104          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
105          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
106          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
107          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
108          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
109          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
110          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
111          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
112          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
113          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

114          KK      E2
115          BA   0.2600
116          LS       0     87
117          UD    0.74
118          IN      15
119          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
120          PB    11.9
121          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
122          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
123          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
124          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
125          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
126          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
127          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
128          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
129          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
130          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

131          KK    COMB
132          HC       2

133          KK     F4a
134          BA   0.0[illegible]
135          LS       0     89.4
136          UD    0.13
137          IN      15
138          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
139          PB    11.9
140          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
```

```
 141          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 142          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 143          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 144          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 145          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 146          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 147          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 148          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 149          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000
1                                          HEC-1 INPUT                                          PAGE  4

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


 150          KK     P4b
 151          BA  0.0418
 152          LS       0      93
 153          UD     .47
 154          IN      15
 155          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 156          PB    11.9
 157          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 158          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 159          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 160          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 161          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 162          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 163          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 164          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 165          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 166          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 167          KK     P4c
 168          BA  0.0470
 169          LS       0      93
 170          UD    0.35
 171          IN      15
 172          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 173          PB    11.9
 174          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 175          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 176          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 177          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 178          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 179          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 180          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 181          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 182          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 183          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 184          KK    COMB
 185          HC       2

 186          KK      E4
 187          BA  0.0511
 188          LS       0    84.9
 189          UD    0.11
 190          IN      15
 191          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 192          PB    11.9
 193          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 194          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 195          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 196          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 197          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 198          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 199          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 200          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
1                                          HEC-1 INPUT                                          PAGE  5

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

 201          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 202          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 203          KK    COMB
 204          HC       4
 205          ZZ
1*************************************                                  *************************************
*                                   *                                  *                                   *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                                  *   U.S. ARMY CORPS OF ENGINEERS    *
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*                JUN   1998                *                                          *    HYDROLOGIC ENGINEERING CENTER    *
*              VERSION 4.1                 *                                          *          609 SECOND STREET          *
* RGMHEC2000                 HEC-1.COM    *                                          *       DAVIS, CALIFORNIA 95616       *
* RUN DATE   01JUL05  TIME  16:11:32      *                                          *          (916) 756-1104          *
*                                         *                                          *                                  *
*******************************************                                          ************************************
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                                HYDROLOGIC ANALYSIS
                                PROJECT: PALACIOS DE GURABO, GURABO, P.R.
                                BY: CA ENGINEERING - JUNE, 2005
                                TYPE II DISTRIBUTION
                                FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
                                PROPOSED CONDITION

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

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ         289  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2    0  ENDING DATE
                     NDTIME        0000  ENDING TIME
                      ICENT          19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.00 HOURS

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

    JP          MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

    JR          MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
                    .41       .67       .82       .92      1.00
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

            ************
            *          *
 10 KK      *   Plab   *
            *          *
            ************
                                RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 14 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

 11 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .07  SUBBASIN AREA

                PRECIPITATION DATA

 16 PB                STORM       11.90  BASIN TOTAL PRECIPITATION

 17 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .01    .00    .01
.01    .01    .01    .01    .01    .01    .01    .01    .03    .03
.03    .09    .09    .09    .01    .01    .01    .01    .01    .01
.01    .01    .01    .01    .01    .01    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
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.00    .00    .00    .00    .00    .00    .00    .00    .00    .00
.00    .00    .00    .00    .00    .00    .00    .00
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12 LS          SCS LOSS RATE
                    STRTL        .15  INITIAL ABSTRACTION
                   CRVNBR      93.00  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

13 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .25  LAG
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                                                UNIT HYDROGRAPH
                                            17 END-OF-PERIOD ORDINATES
          11.     73.    117.    117.     91.     55.     34.     22.     14.      9.
           5.      3.      2.      1.      1.      1.      0.

  TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                   (CFS)
+    416.     12.17                   65.         22.         22.         22.
                                (INCHES)      0.245      11.005      11.005      11.005
                                 (AC-FT)        32.         43.         43.         43.

                                CUMULATIVE AREA =     .07 SQ MI

    ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION      F1ab
                            FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =    4.88, TOTAL LOSS =     .80, TOTAL EXCESS =    4.08

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                                   (CFS)
+    162.     12.17                   25.          8.          8.          8.
                                (INCHES)      1.155       4.064       4.064       4.064
                                 (AC-FT)        12.         16.         16.         16.

                                CUMULATIVE AREA =     .07 SQ MI

    ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION      F1ab
                            FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =    7.97, TOTAL LOSS =     .84, TOTAL EXCESS =    7.14

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
```

```
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)                                                                  
                                      (CFS)
+     275.      12.17                    43.          14.          14.           14.
                                    (INCHES)       5.410        7.111        7.111         7.111
                                     (AC-FT)         21.          28.          28.           28.

                                    CUMULATIVE AREA =      .07 SQ MI

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

                                     HYDROGRAPH AT STATION      Plab
                                       FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =     9.76, TOTAL LOSS =      .85, TOTAL EXCESS =    8.91

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)                                                                  
                                      (CFS)
+     339.      12.17                    53.          17.          17.           17.
                                    (INCHES)       6.701        8.879        8.879         8.879
                                     (AC-FT)         26.          35.          35.           35.

                                    CUMULATIVE AREA =      .07 SQ MI

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

                                     HYDROGRAPH AT STATION      Plab
                                       FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =    10.85, TOTAL LOSS =      .85, TOTAL EXCESS =   10.09

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)                                                                  
                                      (CFS)
+     382.      12.17                    60.          20.          20.           20.
                                    (INCHES)       7.560       10.059       10.059        10.059
                                     (AC-FT)         30.          39.          39.           39.

                                    CUMULATIVE AREA =      .07 SQ MI

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

                                     HYDROGRAPH AT STATION      Plab
                                       FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =    11.90, TOTAL LOSS =      .86, TOTAL EXCESS =   11.04

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)                                                                  
                                      (CFS)
+     416.      12.17                    65.          22.          22.           22.
                                    (INCHES)       8.245       11.005       11.005        11.005
                                     (AC-FT)         32.          43.          43.           43.

                                    CUMULATIVE AREA =      .07 SQ MI

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

            ************
            *          *
 27 KK      *    P3    *
            *          *
            ************
                                    RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 31 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE       1   0  STARTING DATE
                    JXTIME           0  STARTING TIME
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                SUBBASIN RUNOFF DATA

28 BA             SUBBASIN CHARACTERISTICS
                       TAREA          .12  SUBBASIN AREA

                  PRECIPITATION DATA

33 PB                  STORM        11.90  BASIN TOTAL PRECIPITATION

34 PI               INCREMENTAL PRECIPITATION PATTERN
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                       .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                       .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                       .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                       .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00
                       .00       .00       .00       .00       .00       .00       .00       .00

29 LS             SCS LOSS RATE
                       STRTL          .23  INITIAL ABSTRACTION
                       CRVNBR       89.70  CURVE NUMBER
                       RTIMP          .00  PERCENT IMPERVIOUS AREA

30 UD             SCS DIMENSIONLESS UNITGRAPH
                       TLAG           .24  LAG

                                                                                   ***

                                                                  UNIT HYDROGRAPH
                                                            16 END-OF-PERIOD ORDINATES
                 40.      137.      209.      208.      149.       87.       54.       33.       21.       13.
                  8.        3.        1.        2.        1.        1.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.62

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                                        (CFS)
+   708.      12.08                     108.        35.        35.          35.
                                     (INCHES)    8.082     10.589     10.589       10.589
                                      (AC-FT)      53.        70.        70.          70.

                                   CUMULATIVE AREA =     .12 SQ MI

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

                                HYDROGRAPH AT STATION        P3
                                 FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.15, TOTAL EXCESS =    3.73

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                                        (CFS)
+   261.      12.08                      33.        12.        12.          12.
                                     (INCHES)    2.435      3.714      3.714       3.714
```

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(AC-FT)        19.        25.        25.        25.

CUMULATIVE AREA =     .12 SQ MI

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

HYDROGRAPH AT STATION        P3
  FOR PLAN 1, RATIO =  .67

TOTAL RAINFALL =   7.07, TOTAL LOSS =    1.23, TOTAL EXCESS =    6.74

PEAK FLOW      TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    459.     12.08          49.        22.        22.        22.
                        (INCHES)     5.200      6.720      6.720      6.720
                         (AC-FT)        34.        44.        44.        44.

                        CUMULATIVE AREA =     .12 SQ MI

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

HYDROGRAPH AT STATION        P3
  FOR PLAN 1, RATIO =  .82

TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.25, TOTAL EXCESS =    8.50

PEAK FLOW      TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    573.     12.08          87.        28.        28.        28.
                        (INCHES)     6.564      8.475      8.475      8.475
                         (AC-FT)        43.        56.        56.        56.

                        CUMULATIVE AREA =     .12 SQ MI

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

HYDROGRAPH AT STATION        P3
  FOR PLAN 1, RATIO =  .92

TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.27, TOTAL EXCESS =    9.68

PEAK FLOW      TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    648.     12.08          98.        32.        32.        32.
                        (INCHES)     7.370      9.649      9.649      9.649
                         (AC-FT)        48.        64.        64.        64.

                        CUMULATIVE AREA =     .12 SQ MI

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

HYDROGRAPH AT STATION        P3
  FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.62

PEAK FLOW      TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    708.     12.08         108.        35.        35.        35.
                        (INCHES)     8.062     10.589     10.589     10.589
                         (AC-FT)        53.        70.        70.        70.

                        CUMULATIVE AREA =     .12 SQ MI
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*** ***

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          *************
          *           *
44 KK     *     E3    *
          *           *
          *************

                     RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

48 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
                JXDATE      1   0  STARTING DATE
                JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

45 BA        SUBBASIN CHARACTERISTICS
                TAREA         .12  SUBBASIN AREA

             PRECIPITATION DATA

50 PB           STORM       11.90  BASIN TOTAL PRECIPITATION

51 PI         INCREMENTAL PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
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46 LS        SCS LOSS RATE
                STRTL         .30  INITIAL ABSTRACTION
                CRVNBR      86.90  CURVE NUMBER
                RTIMP         .00  PERCENT IMPERVIOUS AREA

47 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG          .19  LAG

                                     ***

                                   UNIT HYDROGRAPH
                              13 END-OF-PERIOD ORDINATES
       67.     215.     254.     189.     100.      57.      32.      18.      10.      5.
        3.       2.       1.

  TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.64, TOTAL EXCESS =   10.26

PEAK FLOW     TIME                       MAXIMUM AVERAGE FLOW
                                 6-HR         24-HR        72-HR      24.00-HR
+  (CFS)      (HR)
                      (CFS)
+    776.    12.08               104.          34.          34.          34.
                    (INCHES)    7.875       10.237       10.237       10.237
                     (AC-FT)      52.          67.          67.          67.

                    CUMULATIVE AREA =      .12 SQ MI
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***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION      E3
                      FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =   4.88, TOTAL LOSS =    1.44, TOTAL EXCESS =    3.44

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    276.     12.08                  36.          11.          11.          11.
                         (INCHES)   2.742        3.433        3.433        3.433
                         (AC-FT)    18.          23.          23.          23.

                         CUMULATIVE AREA =     .12 SQ MI

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

                    HYDROGRAPH AT STATION      E3
                      FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.97, TOTAL LOSS =    1.56, TOTAL EXCESS =    6.41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    498.     12.08                  66.          21.          21.          21.
                         (INCHES)   5.001        6.394        6.394        6.394
                         (AC-FT)    33.          42.          42.          42.

                         CUMULATIVE AREA =     .12 SQ MI

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

                    HYDROGRAPH AT STATION      E3
                      FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.60, TOTAL EXCESS =    8.16

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    625.     12.08                  83.          27.          27.          27.
                         (INCHES)   6.309        8.134        8.134        8.134
                         (AC-FT)    41.          53.          53.          53.

                         CUMULATIVE AREA =     .12 SQ MI

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

                    HYDROGRAPH AT STATION      E3
                      FOR PLAN 1, RATIO =  .92

  TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.62, TOTAL EXCESS =    9.33

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    709.     12.08                  95.          31.          31.          31.
                         (INCHES)   7.180        9.301        9.301        9.301
                         (AC-FT)    47.          61.          61.          61.

                         CUMULATIVE AREA =     .12 SQ MI

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

                    HYDROGRAPH AT STATION      E3
                      FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.64, TOTAL EXCESS =   10.26

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
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```
+   (CFS)        (HR)
                          (CFS)
+    776.       12.08                  104.          34.          34.          34.
                          (INCHES)    7.875       10.237       10.237       10.237
                          (AC-FT)       92.          67.          67.          67.

                          CUMULATIVE AREA =      .12 SQ MI
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*** ***

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                 **************
                 *            *
   61 KK         *    COMB    *
                 *            *
                 **************

   62 HC            HYDROGRAPH COMBINATION
                         ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                          ***

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

                          HYDROGRAPH AT STATION      COMB
                            FOR PLAN 1, RATIO =  .41

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+    536.       12.08                   75.          24.          24.          24.
                          (INCHES)    2.839        3.574        3.574        3.574
                          (AC-FT)       37.          47.          47.          47.

                          CUMULATIVE AREA =      .25 SQ MI

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

                          HYDROGRAPH AT STATION      COMB
                            FOR PLAN 1, RATIO =  .67

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+    957.       12.08                  135.          44.          44.          44.
                          (INCHES)    5.101        6.557        6.557        6.557
                          (AC-FT)       67.          86.          86.          86.

                          CUMULATIVE AREA =      .25 SQ MI

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

                          HYDROGRAPH AT STATION      COMB
                            FOR PLAN 1, RATIO =  .82

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+   1198.       12.08                  170.          55.          55.          55.
                          (INCHES)    6.407        8.305        8.305        8.305
                          (AC-FT)       84.         109.         109.         109.

                          CUMULATIVE AREA =      .25 SQ MI

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

                          HYDROGRAPH AT STATION      COMB
                            FOR PLAN 1, RATIO =  .92

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
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                    (CFS)
+   1357.    12.08                183.        63.        63.        63.
                  (INCHES)       7.275      9.476      9.476      9.476
                   (AC-FT)        96.        125.       125.       125.

                  CUMULATIVE AREA =     .25 SQ MI

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

                 HYDROGRAPH AT STATION     COMB
                   FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                                  6-HR       24-HR      72-HR     24.00-HR
+   (CFS)      (HR)
                    (CFS)
+   1484.    12.08                212.        69.        69.        69.
                  (INCHES)       7.969     10.414     10.414     10.414
                   (AC-FT)       105.        137.       137.       137.

                  CUMULATIVE AREA =     .25 SQ MI
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          *************
          *           *
 63 KK    *    P1c    *
          *           *
          *************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 67 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
                JXDATE      1   0  STARTING DATE
                JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

 64 BA        SUBBASIN CHARACTERISTICS
                TAREA         .01  SUBBASIN AREA

              PRECIPITATION DATA

 69 PB          STORM       11.90  BASIN TOTAL PRECIPITATION

 70 PI        INCREMENTAL PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
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(AC-FT)	38.	48.	48.	48.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = [illegible], TOTAL LOSS = 1.55, TOTAL EXCESS = 6.42

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 934.	12.08		140.	45.	45.	45.
		(INCHES)	5.008	6.400	6.400	6.400
		(AC-FT)	70.	89.	89.	89.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = [illegible], TOTAL LOSS = 1.59, TOTAL EXCESS = 8.17

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1175.	12.08		177.	57.	57.	57.
		(INCHES)	6.316	8.140	8.140	8.140
		(AC-FT)	88.	113.	113.	113.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.9[illegible], TOTAL LOSS = 1.61, TOTAL EXCESS = 9.34

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1334.	12.08		202.	65.	65.	65.
		(INCHES)	7.186	9.306	9.306	9.306
		(AC-FT)	100.	129.	129.	129.

CUMULATIVE AREA = .26 SQ MI

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

HYDROGRAPH AT STATION E2
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = [illegible], TOTAL LOSS = 1.62, TOTAL EXCESS = [illegible]

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1461.	12.08		221.	72.	72.	72.
		(INCHES)	7.882	10.242	10.242	10.242
		(AC-FT)	110.	142.	142.	142.

CUMULATIVE AREA = .26 SQ MI

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

                HYDROGRAPH AT STATION      P1c
                  FOR PLAN 1, RATIO =  .92

 TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.74, TOTAL EXCESS =    9.21

PEAK FLOW   TIME                          MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR      24.00-HR
+  (CFS)     (HR)
                 (CFS)
+     43.    12.25                 8.           2.           2.           2.
                (INCHES)       7.110        9.161        9.161        9.161
                 (AC-FT)          4.           5.           5.           5.

                CUMULATIVE AREA =     .01 SQ MI

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

                HYDROGRAPH AT STATION      P1c
                  FOR PLAN 1, RATIO = 1.00

 TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.75, TOTAL EXCESS =   10.15

PEAK FLOW   TIME                          MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR      24.00-HR
+  (CFS)     (HR)
                 (CFS)
+     47.    12.25                 8.           3.           3.           3.
                (INCHES)       7.806       10.093       10.093       10.093
                 (AC-FT)          4.           5.           5.           5.

                CUMULATIVE AREA =     .01 SQ MI

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

            *************
            *           *
 80 KK      *    P1d    *
            *           *
            *************
                        RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 84 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
              JXDATE       1   0  STARTING DATE
              JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

 81 BA        SUBBASIN CHARACTERISTICS
                TAREA        .01  SUBBASIN AREA

            PRECIPITATION DATA

 86 PP          STORM      11.90  BASIN TOTAL PRECIPITATION

 87 PI        INCREMENTAL PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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82 LS          SCS LOSS RATE
                    STRTL        .36  INITIAL ABSTRACTION
                   CRVNBR      84.70  CURVE NUMBER
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

83 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .03  LAG

                                                        ***

                                                   UNIT HYDROGRAPH
                                              5 END-OF-PERIOD ORDINATES
              59.       17.        3.        1.        0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.92, TOTAL EXCESS =    9.98

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+     83.     12.00                   9.          3.          3.          3.
                         (INCHES)  7.714       9.971       9.971       9.971
                          (AC-FT)      4.          5.          5.          5.

                        CUMULATIVE AREA =     .01 SQ MI

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

                       HYDROGRAPH AT STATION      P1d
                         FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.65, TOTAL EXCESS =    3.23

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+     29.     12.00                   3.          1.          1.          1.
                         (INCHES)  2.589       3.225       3.225       3.225
                          (AC-FT)      1.          2.          2.          2.

                        CUMULATIVE AREA =     .01 SQ MI

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

                       HYDROGRAPH AT STATION      P1d
                         FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.82, TOTAL EXCESS =    6.15

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+     53.     12.00                   5.          2.          2.          2.
                         (INCHES)  4.836       6.148       6.148       6.148
                          (AC-FT)      3.          3.          3.          3.

                        CUMULATIVE AREA =     .01 SQ MI

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

                       HYDROGRAPH AT STATION      P1d
                         FOR PLAN 1, RATIO =  .82
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TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.88, TOTAL EXCESS =   - 7.88

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+     67.     12.00                 7.          2.          2.          2.
                            (INCHES)     6.143       7.876       7.876       7.876
                             (AC-FT)        3.          4.          4.          4.

                           CUMULATIVE AREA =     .01 SQ MI

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

                         HYDROGRAPH AT STATION      P1d
                           FOR PLAN 1, RATIO =   .92

TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.90, TOTAL EXCESS =    9.04

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+     76.     12.00                 8.          3.          3.          3.
                            (INCHES)     7.016       9.038       9.038       9.038
                             (AC-FT)        4.          5.          5.          5.

                           CUMULATIVE AREA =     .01 SQ MI

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

                         HYDROGRAPH AT STATION      P1d
                           FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.92, TOTAL EXCESS =    9.98

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+     83.     12.00                 9.          3.          3.          3.
                            (INCHES)     7.714       9.971       9.971       9.971
                             (AC-FT)        4.          5.          5.          5.

                           CUMULATIVE AREA =     .01 SQ MI


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


            *************
            *           *
 97 KK      *     E1    *
            *           *
            *************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

101 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

 98 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .49  SUBBASIN AREA

                PRECIPITATION DATA

103 PB               STORM       11.90  BASIN TOTAL PRECIPITATION

104 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                    .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00		

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 99 LS          SCS LOSS RATE
                  STRTL          .33  INITIAL ABSTRACTION
                  CRVNBR       85.70  CURVE NUMBER
                  RTIMP          .00  PERCENT IMPERVIOUS AREA

100 UD          SCS DIMENSIONLESS UNITGRAPH
                  TLAG           .40  LAG

                                                    ***

                                              UNIT HYDROGRAPH
                                          26 END-OF-PERIOD ORDINATES
        49.     151.     317.     469.     530.     517.     449.     356.     246.     180.
       135.     100.      73.      54.      39.      29.      21.      16.      12.       9.
         6.       5.       4.       3.       2.       1.

    TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.79, TOTAL EXCESS =   10.11

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR      24.00-HR
+   (CFS)       (HR)
                           (CFS)
+   2109.      12.25                   408.        132.        132.        132.
                         (INCHES)     7.763      10.045      10.045      10.045
                          (AC-FT)      202.        261.        261.        261.

                         CUMULATIVE AREA =     .49 SQ MI


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

                         HYDROGRAPH AT STATION        E1
                          FOR PLAN 1, RATIO =   .41

    TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.76, TOTAL EXCESS =    3.12

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR      24.00-HR
+   (CFS)       (HR)
                           (CFS)
+    721.      12.25                   170.         43.         43.         43.
                         (INCHES)     2.455       3.100       3.100       3.100
                          (AC-FT)       74.         86.         86.         86.

                         CUMULATIVE AREA =     .49 SQ MI


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

                         HYDROGRAPH AT STATION        E1
                          FOR PLAN 1, RATIO =   .67

    TOTAL RAINFALL =   [illegible], TOTAL LOSS =    1.[illegible], TOTAL EXCESS =   [illegible].77

 PEAK FLOW      TIME                           MAXIMUM AVERAGE FLOW
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                                        6-HR        24-HR        72-HR     24.00-HR
 (CFS)       (HR)
                                (CFS)
 1336.      12.25                257.         82.          82.          82.
                            (INCHES)       4.309        6.228        6.228        6.228
                             (AC-FT)        127.         162.         162.         162.

                          CUMULATIVE AREA =      .49 SQ MI

     ...            ...            ...            ...            ...

                          HYDROGRAPH AT STATION        E1
                            FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =     1.75, TOTAL EXCESS =     8.01

 PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR     24.00-HR
 (CFS)        (HR)
                                (CFS)
 1689.      12.25                325.        104.         104.         104.
                            (INCHES)       6.215        7.955        7.955        7.955
                             (AC-FT)        161.         207.         207.         207.

                          CUMULATIVE AREA =      .49 SQ MI

     ...            ...            ...            ...            ...

                          HYDROGRAPH AT STATION        E1
                            FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.49, TOTAL LOSS =     1.78, TOTAL EXCESS =     9.17

 PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR     24.00-HR
 (CFS)        (HR)
                                (CFS)
 1922.      12.25                371.        119.         119.         119.
                            (INCHES)       7.084        9.114        9.114        9.114
                             (AC-FT)        184.         237.         237.         237.

                          CUMULATIVE AREA =      .49 SQ MI

     ...            ...            ...            ...            ...

                          HYDROGRAPH AT STATION        E1
                            FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =     1.79, TOTAL EXCESS =    10.11

 PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR     24.00-HR
 (CFS)        (HR)
                                (CFS)
 2109.      12.25                408.        132.         132.         132.
                            (INCHES)       7.783       10.045       10.045       10.045
                             (AC-FT)        202.         261.         261.         261.

                          CUMULATIVE AREA =      .49 SQ MI


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


                 ************
                 *          *
 114 KK          *    E1    *
                 *          *
                 ************
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 110 IN            TIME DATA FOR INPUT TIME SERIES
                        JMIN          10  TIME INTERVAL IN MINUTES
                       JDATE       1    0  STARTING DATE
                       JTIME            0  STARTING TIME
```

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 5244.	12.17		922.	300.	300.	300.
		(INCHES)	7.976	10.240	10.240	10.240
		(AC-FT)	457.	594.	594.	594.

CUMULATIVE AREA = 1.09 SQ MI

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          *            *
133 KK    *     P4a    *
          *            *
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RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

137 IN TIME DATA FOR INPUT TIME SERIES
- JXMIN 15 TIME INTERVAL IN MINUTES
- JXDATE 1 0 STARTING DATE
- JXTIME 0 STARTING TIME

SUBBASIN RUNOFF DATA

134 BA SUBBASIN CHARACTERISTICS
- TAREA .03 SUBBASIN AREA

PRECIPITATION DATA

139 PB STORM 11.90 BASIN TOTAL PRECIPITATION

140 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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135 LS SCS LOSS RATE
- STRTL .24 INITIAL ABSTRACTION
- CRVNBR 89.40 CURVE NUMBER
- RTIMP .00 PERCENT IMPERVIOUS AREA

136 UD SCS DIMENSIONLESS UNITGRAPH
- TLAG .13 LAG

***

UNIT HYDROGRAPH
10 END-OF-PERIOD ORDINATES

36.	61.	58.	25.	11.	5.	2.	1.	1.	0.

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                ..............
                .            .
131 KK          .    COMB    .
                .            .
                ..............

132 HC          HYDROGRAPH COMBINATION
                     ICOMP          6  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                    ...

     ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   1857.      12.17                722.         101.         101.         101.
                          (INCHES)   2.750        3.447        3.447        3.447
                          (AC-FT)    166.         290.         290.         290.

                    CUMULATIVE AREA =    1.09 SQ MI

     ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .67

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   3359.      12.17                596.         187.         187.         187.
                          (INCHES)   5.009        6.403        6.403        6.403
                          (AC-FT)    291.         372.         372.         372.

                    CUMULATIVE AREA =    1.09 SQ MI

     ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   4219.      12.17                716.         238.         238.         238.
                          (INCHES)   6.212        8.141        8.141        8.141
                          (AC-FT)    364.         472.         472.         472.

                    CUMULATIVE AREA =    1.09 SQ MI

     ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO =  .92

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   4704.      12.17                841.         272.         272.         272.
                          (INCHES)   7.101        9.304        9.304        9.304
                          (AC-FT)    417.         540.         540.         540.

                    CUMULATIVE AREA =    1.09 SQ MI

     ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO = 1.00
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                    (AC-FT)        11.         14.         14.         14.

                    CUMULATIVE AREA =     .03 SQ MI

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

                    HYDROGRAPH AT STATION      P4a
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.31, TOTAL EXCESS =   10.59

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    200.     12.00                 24.          8.          8.          8.
                         (INCHES)   8.045      10.568      10.568      10.568
                         (AC-FT)      12.         16.         16.         16.

                    CUMULATIVE AREA =     .03 SQ MI


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


            ............
            .          .
150 KK      .    P4b   .
            .          .
            ............
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

154 IN        TIME DATA FOR INPUT TIME SERIES
                JDMIN          15  TIME INTERVAL IN MINUTES
               JXDATE      1    0  STARTING DATE
               JXTIME           0  STARTING TIME

            SUBBASIN RUNOFF DATA

151 BA        SUBBASIN CHARACTERISTICS
                TAREA         .39  SUBBASIN AREA

              PRECIPITATION DATA

156 PB          STORM       11.90  BASIN TOTAL PRECIPITATION

157 PI        INCREMENTAL PRECIPITATION PATTERN
                .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                .01        .09        .09        .09        .01        .01        .01        .01        .01        .01
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152 LS SCS LOSS RATE

TOTAL RAINFALL = 11.90, TOTAL LOSS = 1.31, TOTAL EXCESS = 10.59

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
200.	12.00	(CFS)	24.	8.	8.	8.
		(INCHES)	8.045	10.568	10.568	10.568
		(AC-FT)	12.	16.	16.	16.

CUMULATIVE AREA = .03 SQ MI

... ...

HYDROGRAPH AT STATION P4a
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.96, TOTAL LOSS = 1.18, TOTAL EXCESS = 3.78

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
74.	12.00	(CFS)	3.	3.	3.	3.
		(INCHES)	2.915	3.690	3.690	3.690
		(AC-FT)	4.	6.	6.	6.

CUMULATIVE AREA = .03 SQ MI

... ...

HYDROGRAPH AT STATION P4a
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = 1.27, TOTAL EXCESS = 6.71

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
130.	12.00	(CFS)	16.	5.	5.	5.
		(INCHES)	5.181	6.696	6.696	6.696
		(AC-FT)	8.	10.	10.	10.

CUMULATIVE AREA = .03 SQ MI

... ...

HYDROGRAPH AT STATION P4a
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 1.29, TOTAL EXCESS = 8.47

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
162.	12.00	(CFS)	20.	6.	6.	6.
		(INCHES)	6.486	8.452	8.452	8.452
		(AC-FT)	10.	13.	13.	13.

CUMULATIVE AREA = .03 SQ MI

... ...

HYDROGRAPH AT STATION P4a
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.94, TOTAL LOSS = 1.38, TOTAL EXCESS = 9.56

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
183.	12.00	(CFS)	22.	7.	7.	7.
		(INCHES)	7.353	9.627	9.627	9.627

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

                      HYDROGRAPH AT STATION      P4b
                        FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =      .85, TOTAL EXCESS =   10.09

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     349.      12.33                 75.          25.          25.          25.
                                 (INCHES)       7.554       10.023       10.023       10.023
                                  (AC-FT)         37.          49.          49.          49.

                                 CUMULATIVE AREA =      .09 SQ MI

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

                      HYDROGRAPH AT STATION      P4b
                        FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.[illegible], TOTAL LOSS =      .86, TOTAL EXCESS =   11.04

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     380.      12.33                 81.          27.          27.          27.
                                 (INCHES)       8.239       10.965       10.965       10.965
                                  (AC-FT)         40.          54.          54.          54.

                                 CUMULATIVE AREA =      .09 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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                 *            *
 167 KK          *     P4c    *
                 *            *
                 **************
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 171 IN            TIME DATA FOR INPUT TIME SERIES
                        JXMIN          15  TIME INTERVAL IN MINUTES
                       JXDATE       1    0  STARTING DATE
                       JXTIME            0  STARTING TIME

                 SUBBASIN RUNOFF DATA

 168 BA            SUBBASIN CHARACTERISTICS
                        TAREA         .09  SUBBASIN AREA

                   PRECIPITATION DATA

 172 PB                  STORM       11.90  BASIN TOTAL PRECIPITATION

 174 PI              INCREMENTAL PRECIPITATION PATTERN
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                        .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                        .09       .09       .09       .09       .01       .01       .01       .01       .01       .01
                        .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00
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169 LS          SCS LOSS RATE
                  STRTL        .15  INITIAL ABSTRACTION
                 CRVNBR      82.00  CURVE NUMBER
                  RTIMP        .00  PERCENT IMPERVIOUS AREA

170 UD          SCS DIMENSIONLESS UNITGRAPH
                  TLAG        .35  LAG
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                                        UNIT HYDROGRAPH
                                     23 END-OF-PERIOD ORDINATES
        6.      20.      42.      56.      58.      51.      40.      27.      19.      14.
       10.       7.       5.       3.       2.       2.       1.       1.       1.       0.
        0.       0.       0.

  TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   228.      12.25                 42.         14.         14.         14.
                         (INCHES)   8.248      10.987      10.987      10.987
                         (AC-FT)    21.         28.         28.         28.

                         CUMULATIVE AREA =     .05 SQ MI
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... ...

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                         HYDROGRAPH AT STATION      P4c
                           FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =    4.88, TOTAL LOSS =     .80, TOTAL EXCESS =    4.08

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    88.      12.25                 10.          5.          5.          5.
                         (INCHES)   4.114       4.057       4.057       4.057
                         (AC-FT)     8.         10.         10.         10.

                         CUMULATIVE AREA =     .05 SQ MI
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                         HYDROGRAPH AT STATION      P4c
                           FOR PLAN 1, RATIO =  .87

  TOTAL RAINFALL =    7.97, TOTAL LOSS =     .84, TOTAL EXCESS =    7.13

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   150.      12.25                 27.          9.          9.          9.
                         (INCHES)   7.408       7.099       7.099       7.099
                         (AC-FT)    14.         18.         18.         18.

                         CUMULATIVE AREA =     .05 SQ MI
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                         HYDROGRAPH AT STATION      P4c
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                    FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =     .85, TOTAL EXCESS =    8.91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    186.     12.25                  34.         11.         11.          11.
                         (INCHES)   6.699       8.864       8.864        8.864
                         (AC-FT)    17.         22.         22.          22.

                         CUMULATIVE AREA =     .05 SQ MI

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

                 HYDROGRAPH AT STATION      P4c
                   FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =     .85, TOTAL EXCESS =   10.09

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    209.     12.25                  38.         13.         13.          13.
                         (INCHES)   7.558      10.043      10.043       10.043
                         (AC-FT)    19.         25.         25.          25.

                         CUMULATIVE AREA =     .05 SQ MI

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

                 HYDROGRAPH AT STATION      P4c
                   FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    228.     12.25                  42.         14.         14.          14.
                         (INCHES)   8.243      10.987      10.987       10.987
                         (AC-FT)    21.         28.         28.          28.

                         CUMULATIVE AREA =     .05 SQ MI


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

            ..............
            .            .
104 KK      .     COMB   .
            .            .
            ..............

105 HC          HYDROGRAPH COMBINATION
                         ICOMB          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ***

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

                 HYDROGRAPH AT STATION      COMB
                   FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    230.     12.25                  47.         15.         15.          15.
                         (INCHES)   3.132       4.051       4.051        4.051
                         (AC-FT)    23.         30.         30.          30.

                         CUMULATIVE AREA =     .14 SQ MI
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...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .87

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+ (CFS)       (HR)
                          (CFS)
+   392.      12.25                 91.          26.          26.          26.
                        (INCHES)   5.408        7.090        7.090        7.090
                        (AC-FT)     40.          52.          52.          52.

                      CUMULATIVE AREA =      .14 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .82

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+ (CFS)       (HR)
                          (CFS)
+   485.      12.25                100.          33.          33.          33.
                        (INCHES)   6.697        8.853        8.853        8.853
                        (AC-FT)     50.          66.          66.          66.

                      CUMULATIVE AREA =      .14 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .92

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+ (CFS)       (HR)
                          (CFS)
+   546.      12.25                113.          37.          37.          37.
                        (INCHES)   7.555       10.030       10.030       10.030
                        (AC-FT)     56.          74.          74.          74.

                      CUMULATIVE AREA =      .14 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO = 1.00

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+ (CFS)       (HR)
                          (CFS)
+   595.      12.25                123.          41.          41.          41.
                        (INCHES)   8.241       10.973       10.973       10.973
                        (AC-FT)     61.          81.          81.          81.

                      CUMULATIVE AREA =      .14 SQ MI


... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

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186 KK        .     E4     .
              .            .
              ..............
                          RUNOFF COMPUTATION 100-YR2 STORM IN PROJECT AREA

190 IN          TIME DATA FOR INPUT TIME SERIES
                     (MIN)          15  TIME INTERVAL IN MINUTES
                     (NDAT)      1    0  STARTING DATE
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                    XTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

187 BA          SUBBASIN CHARACTERISTICS
                     TAREA        .05  SUBBASIN AREA

                PRECIPITATION DATA

192 PB                STORM      11.90  BASIN TOTAL PRECIPITATION

193 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                     .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                     .03       .03       .03       .03       .01       .01       .01       .01       .01       .01
                     .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00
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198 LS          SCS LOSS RATE
                     STRTL        .36  INITIAL ABSTRACTION
                    CSVNBR      94.90  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

199 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .11  LAG

                                                    ***

                                                UNIT HYDROGRAPH
                                            = END-OF-PERIOD ORDINATES
              92.      162.      84.       34.       14.       6.        2.        1.        0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.90, TOTAL EXCESS =   10.00

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
  (CFS)       (HR)
                          (CFS)
   370.     12.00                 42.         14.         14.         14.
                         (INCHES)   7.728      3.988       9.988       9.988
                          (AC-FT)   21.         27.         27.         27.

                         CUMULATIVE AREA =     .05 SQ MI

    ...            ...            ...            ...            ***

                         HYDROGRAPH AT STATION       E4
                           FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.63, TOTAL EXCESS =    3.25

PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
  (CFS)       (HR)
                          (CFS)
   127.     12.00                 14.          4.          4.          4.
```

(INCHES)	2.603	3.241	3.241	[illegible]
(AC-FT)	7.	9.	9.	[illegible]

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION E4
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = 1.80, TOTAL EXCESS = 6.18

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 235.	12.00		27.	8.	8.	8.
		(INCHES)	4.851	6.165	6.165	6.165
		(AC-FT)	13.	17.	17.	17.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION E4
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 1.85, TOTAL EXCESS = 7.91

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 297.	12.00		34.	11.	11.	11.
		(INCHES)	6.158	7.894	7.894	7.894
		(AC-FT)	17.	22.	22.	22.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION E4
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 1.88, TOTAL EXCESS = 9.07

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 338.	12.00		39.	12.	12.	12.
		(INCHES)	7.031	9.056	9.056	9.056
		(AC-FT)	19.	25.	25.	25.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION E4
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 11.[illegible], TOTAL LOSS = 1.90, TOTAL EXCESS = 10.[illegible]

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 370.	12.00		42.	14.	14.	14.
		(INCHES)	7.[illegible]	9.988	9.988	9.988
		(AC-FT)	21.	27.	27.	27.

CUMULATIVE AREA = .05 SQ MI

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                .............
                .           .
203 KK          .   COMB    .
                .           .
                .............

204 HC          HYDROGRAPH COMBINATION
                      ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                   ***

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

                     HYDROGRAPH AT STATION     COMB
                       FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                  (CFS)
+    356.      12.00                 70.          22.          22.          22.
                (INCHES)            2.992        3.815        3.815        3.815
                (AC-FT)               35.          44.          44.          44.

                CUMULATIVE AREA =      .22 SQ MI

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

                     HYDROGRAPH AT STATION     COMB
                       FOR PLAN 1, RATIO =  .67

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                  (CFS)
+    623.      12.00                 123.         40.          40.          40.
                (INCHES)            5.246        6.822        6.822        6.822
                (AC-FT)               61.          79.          79.          79.

                CUMULATIVE AREA =      .22 SQ MI

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

                     HYDROGRAPH AT STATION     COMB
                       FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                  (CFS)
+    778.      12.00                 153.         50.          50.          50.
                (INCHES)            6.543        8.576        8.576        8.576
                (AC-FT)               76.         100.         100.         100.

                CUMULATIVE AREA =      .22 SQ MI

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

                     HYDROGRAPH AT STATION     COMB
                       FOR PLAN 1, RATIO =  .92

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                  (CFS)
+    880.      12.00                 174.         57.          57.          57.
                (INCHES)            7.405        9.750        9.750        9.750
                (AC-FT)               86.         113.         113.         113.

                CUMULATIVE AREA =      .22 SQ MI

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

                     HYDROGRAPH AT STATION     COMB
                       FOR PLAN 1, RATIO = 1.00
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
		(CFS)				
961.	12.00		190.	63.	63.	63.
		(INCHES)	8.094	10.690	10.690	10.690
		(AC-FT)	94.	124.	124.	124.

CUMULATIVE AREA = .23 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .41	RATIO 2 .67	RATIO 3 .82	RATIO 4 .92	RATIO 5 1.00
HYDROGRAPH AT	P1a	.07	1	FLOW	162.	275.	339.	381.	416.
				TIME	12.17	12.17	12.17	12.17	12.17
HYDROGRAPH AT	E3	.12	1	FLOW	261.	459.	571.	648.	700.
				TIME	12.08	12.08	12.08	12.08	12.08
HYDROGRAPH AT	E3	.12	1	FLOW	270.	498.	625.	709.	1761.
				TIME	12.08	12.08	12.08	12.08	12.08
2 COMBINED AT	COM2	.25	1	FLOW	526.	957.	1198.	1357.	1474.
				TIME	12.08	12.08	12.08	12.08	12.08
HYDROGRAPH AT	P12	.01	1	FLOW	16.	30.	38.	43.	47.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT	P12	.01	1	FLOW	29.	53.	67.	76.	82.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT	E1	.49	1	FLOW	721.	1396.	1669.	1822.	1909.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT	E2	.2[illegible]	1	FLOW	514.	934.	1175.	1334.	1461.
				TIME	12.17	12.08	12.08	12.08	12.08
4 COMBINED AT	COM3	1.[illegible]	1	FLOW	1857.	3359.	4219.	4799.	5244.
				TIME	12.17	12.17	12.17	12.17	12.17
HYDROGRAPH AT	P4a	.0[illegible]	1	FLOW	74.	130.	162.	184.	200.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT	P4b	.10	1	FLOW	147.	250.	308.	349.	380.
				TIME	12.33	12.33	12.33	12.33	12.33
HYDROGRAPH AT	P4c	.[illegible]	1	FLOW	88.	156.	196.	224.	228.
				TIME	12.25	12.25	12.25	12.25	12.25
2 COMBINED AT	COM4	.11	1	FLOW	220.	382.	483.	549.	595.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT	E4	.[illegible]	1	FLOW	127.	235.	297.	338.	370.
				TIME	12.00	12.00	12.00	12.00	12.00
2 COMBINED AT	COM5	.[illegible]	1	FLOW	356.	625.	778.	880.	961.
				TIME	12.08	12.08	12.08	12.08	12.08

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

APPENDIX D

FLOW RATING CURVE FOR MITIGATION STRUCTURE

Project: Palacios de Gurabo

Gurabo, Puerto Rico.

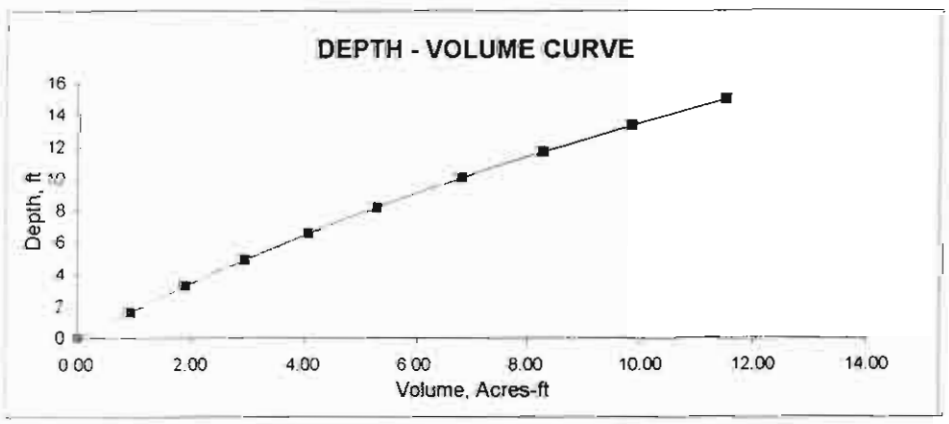
Description: Pond #1

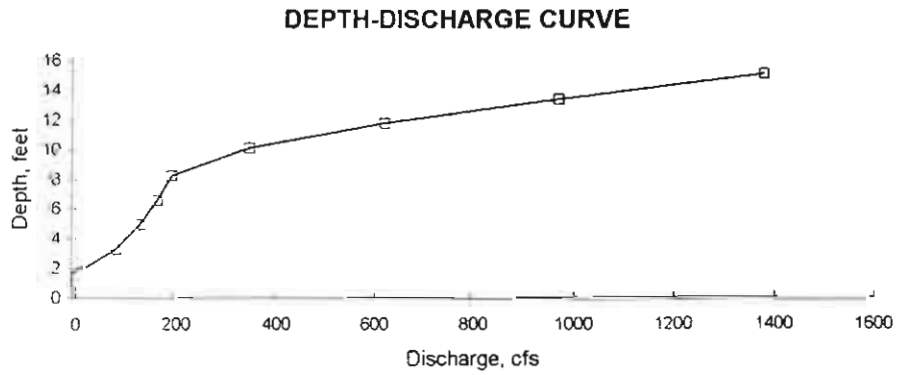
FLOW RATING CURVE

Structure	Head	m	0	0.5	1	1.5	2	2.5	3.07	3.57	4.07	4.57
		ft	0	1.64	3.28	4.92	6.56	8.2	10.0696	11.71	13.35	14.9896
	Diameter (feet)		**4.5**	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Number		**1**	1	1	1	1	1	1	1	1	1
	Head over CL (feet)		-2.25	-0.61	1.03	2.67	4.31	5.95	7.8196	9.4596	11.1	12.7396
ORIF #1	Discharge Coef		**0.61**	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
	Flow (cfs)		0	0	79.015	127.217	161.63	189.91	217.711	239.46	259.38	277.8859
	Head over invert (feet)		0	1.64	3.28	4.92	6.56	8.2	10.0696	11.71	13.35	14.9896
	Velocity (fps)		0	0	4.9681	7.99887	10.163	11.941	13.6888	15.056	16.309	17.47232
	Invert El (m)		**2.6**	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Rect	(feet)		8.528	8.528	8.528	8.528	8.528	8.528	8.528	8.528	8.528	8.528
WEIR	Width (feet)		**24**	24	24	24	24	24	24	24	24	24
	Cc		**0.66**	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
	Head over weir (feet)		-8.528	-6.89	-5.248	-3.608	-1.968	-0.328	1.5416	3.1816	4.8216	6.4616
	Flow (cfs)		0	0	0	0	0	0	128.466	380.89	710.59	1102.407
	FLOW SUMMATION (cfs)		0	0	79.015	127.217	161.63	189.91	346.178	620.35	969.97	1380.293

RECTANGULAR LAGOON

Lado A de la Base, ft	**150**	150	150	150	150	150	150	150	150	150
Lado B de la Base, ft	**150**	150	150	150	150	150	150	150	150	150
h (ft)	**0**	**1.64**	**3.28**	**4.92**	**6.56**	**8.2**	**10.0696**	**11.71**	**13.35**	**14.9896**
Slope 1	**2**	2	2	2	2	2	2	2	2	2
Area (sqft)	22500	24511	26608	28791	31061	33416	36206	38745	41371	44083
(acre)	**0.52**	**0.56**	**0.61**	**0.66**	**0.71**	**0.77**	**0.83**	**0.89**	**0.95**	**1.01**
Volume, acre-ft	**0.00**	**0.89**	**1.85**	**2.90**	**4.04**	**5.27**	**6.79**	**8.24**	**9.80**	**11.47**
Lado A del Tope	150	156.6	163.12	169.68	176.24	182.8	190.278	196.84	203.4	209.9584
Lado B del Tope	150	156.6	163.12	169.68	176.24	182.8	190.278	196.84	203.4	209.9584

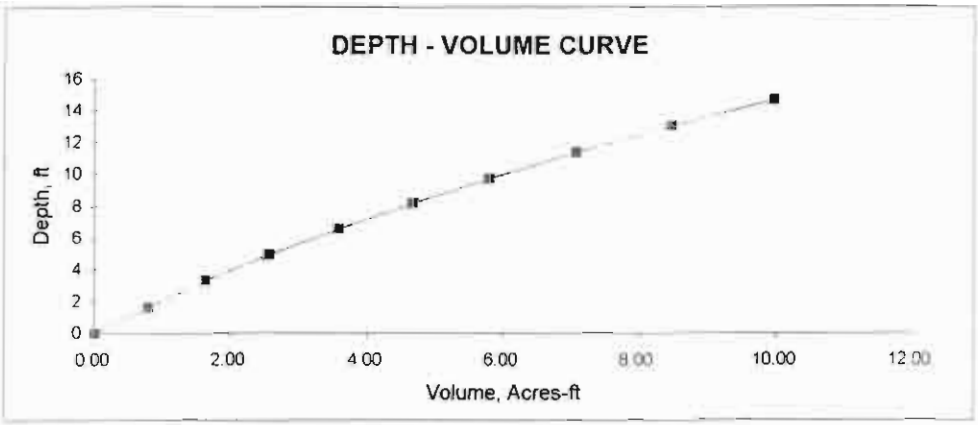


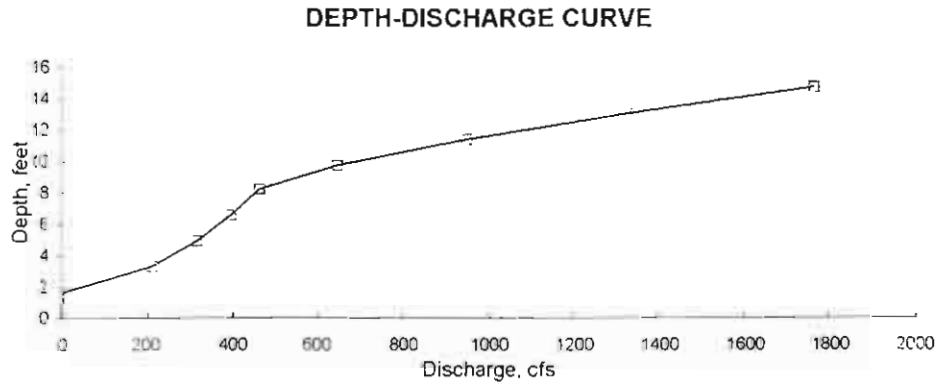


Project: Palacios de Gurabo
Gurabo, Puerto Rico.
Description: Pond #2

FLOW RATING CURVE

Structure	Head	m	0	0.5	1	1.5	2	2.5	2.97	3.47	3.97	4.47
		ft	0	1.64	3.28	4.92	6.56	8.2	9.7416	11.38	13.0216	14.6616
	Diameter (feet)		4	4	4	4	4	4	4	4	4	4
	Number		3	3	3	3	3	3	3	3	3	3
	Head over CL (feet)		-2	-0.36	1.28	2.92	4.56	6.2	7.7416	9.382	11.0216	12.6616
ORIF #1	Discharge Coef		0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
	Flow (cfs)		0	0	208.79	315.35	394.08	459.52	513.48	565.3	612.67086	656.673
	Head over invert (feet)		0	1.64	3.28	4.92	6.56	8.2	9.7416	11.38	13.0216	14.6616
	Velocity (fps)		0	0	16.615	25.095	31.36	36.567	40.861	44.98	48.754684	52.2563
	Invert El (m)		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Rect	(feet)		8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
WEIR	Width (feet)		24	24	24	24	24	24	24	24	24	24
	Cc		0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
	Head over weir (feet)		-8.2	-6.56	-4.92	-3.28	-1.64	0	1.5416	3.182	4.8216	6.4616
	Flow (cfs)		0	0	0	0	0	0	128.47	380.9	710.58953	1102.41
	FLOW SUMMATION (cfs)		0	0	208.79	315.35	394.08	459.52	641.94	946.1	1323.2604	1759.08
RECTANGULAR LAGOON												
	Lado A de la Base, ft		140	140	140	140	140	140	140	140	140	140
	Lado B de la Base, ft		140	140	140	140	140	140	140	140	140	140
	h (ft)		0	1.64	3.28	4.92	6.56	8.2	9.7416	11.38	13.0216	14.6616
	Slope 1		2	2	2	2	2	2	2	2	2	2
	Area (sqft)		19600	21480	23446	25498	27636	29860	32029	34420	36897	39460
	(acre)		0.45	0.49	0.54	0.59	0.63	0.69	0.74	0.79	0.85	0.91
	Volume, acre-ft		0.00	0.77	1.62	2.55	3.56	4.66	5.78	7.06	8.45	9.95
	Lado A del Tope		140	146.56	153.12	159.68	166.24	172.8	178.97	185.5	192.0864	198.646
	Lado B del Tope		140	146.56	153.12	159.68	166.24	172.8	178.97	185.5	192.0864	198.646





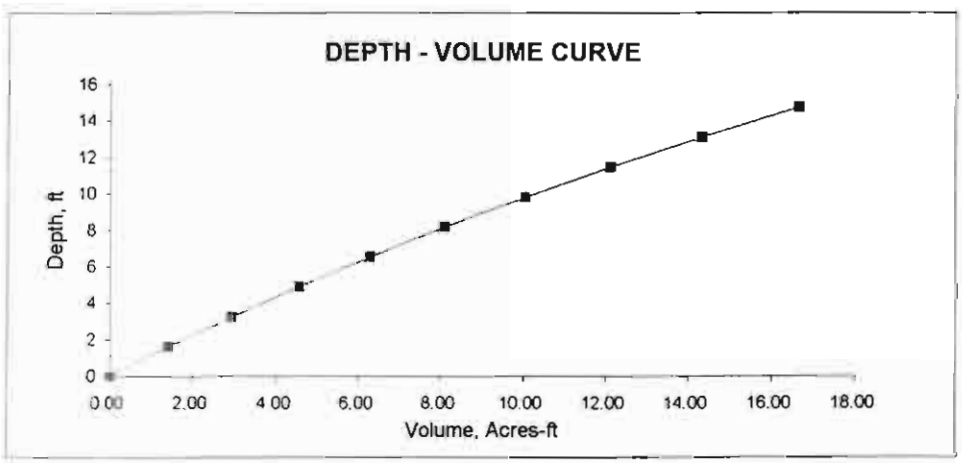
Project: Palacios de Gurabo

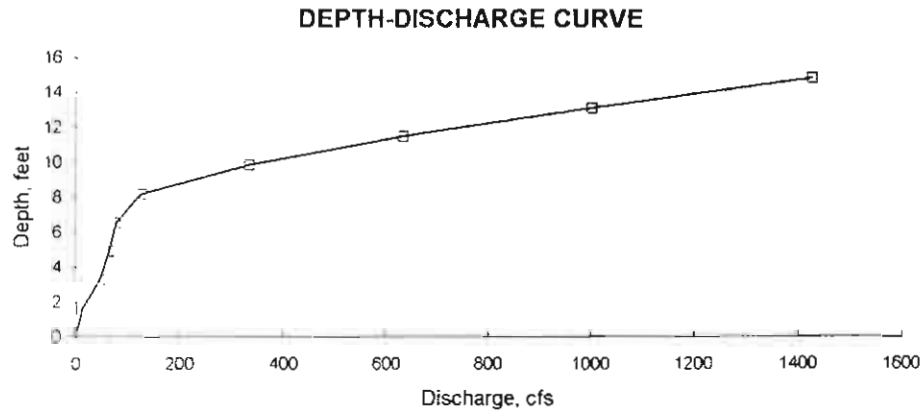
Gurabo, Puerto Rico.

Description: Pond #3

FLOW RATING CURVE

Structure Head		m	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5
		ft	0	1.64	3.28	4.92	6.56	8.2	9.84	11.48	13 12	14.76
	Diameter (feet)		3	3	3	3	3	3	3	3	3	3
	Number		1	1	1	1	1	1	1	1	1	1
	Head over CL (feet)		-1.5	0 14	1.78	3.42	5.06	6.7	8.34	9.98	11.62	13.26
ORIF #1	Discharge Coef		0.61	0.61	0.61	0.61	0.61	0 61	0.61	0.61	0.61	0.61
	Flow (cfs)		0	12.947	46.1654	63.991	77.836	89.566	99.9285	109.31	117.953	126 002
	Head over invert (feet)		0	1.64	3.28	4.92	6.56	8.2	9.84	11.48	13.12	14.76
	Velocity (fps)		0	1.83163	6.53105	9.0529	11.012	12.671	14.137	15.465	16.6869	17.8256
	Invert El (m)		2.3	2 3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Rect	(feet)		7.544	7.544	7.544	7.544	7.544	7.544	7.544	7.544	7 544	7.544
WEIR	Width (feet)		24	24	24	24	24	24	24	24	24	24
	Cc		0.66	0.66	0.66	0 66	0.66	0.66	0.66	0.66	0.66	0.66
	Head over weir (feet)		-7.544	-5.904	-4.264	-2.624	-0.984	0 656	2.296	3.936	5.576	7.216
	Flow (cfs)		0	0	0	0	0	35.661	233.502	524.1	883.723	1301
	FLOW SUMMATION (cfs)		0	12.947	46.1654	63.991	77 836	125.23	333.43	633.41	1001.68	1427
RECTANGULAR LAGOON												
	Lado A de la Base, ft		190	190	190	190	190	190	190	190	190	190
	Lado B de la Base, ft		190	190	190	190	190	190	190	190	190	190
	h (ft)		0	1.64	3.28	4.92	6.56	8.2	9.84	11.48	13.12	14.76
	Slope 1		2	2	2	2	2	2	2	2	2	2
	Area (sqft)		36100	38636	41258	43966	46760	49640	52606	55658	58797	62021
	(acre)		0.83	0.89	0.95	1.01	1.07	1.14	1.21	1.28	1.35	1.42
	Volume, acre-ft		0.00	1.41	2.92	4.53	6.25	8.08	10.03	12.10	14.31	16.64
	Lado A del Tope		190	196.56	203.12	209.68	216.24	222.8	229.36	235 92	242.48	249.04
	Lado B del Tope		190	196.56	203.12	209.68	216.24	222.8	229.36	235 92	242.48	249.04





APPENDIX E

HEC-1 RESULTS FOR PROPOSED CONDITION W/MITIGATION

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            JUN   1998                 *
*          VERSION 4.1                  *
* RGMHEC1000                HEC-1.COM   *
* RUN DATE   01JUL05  TIME  16:11:35    *
*                                       *
*****************************************
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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 756-1104          *
*                                   *
*************************************
```

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

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

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

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

  1           ID        HYDROLOGIC ANALYSIS
  2           ID        PROJECT: PALACIOS DE GURABO, GURABO, P.R.
  3           ID        BY: CA ENGINEERING - JUNE, 2005
  4           ID        TYPE II DISTRIBUTION
  5           ID        FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
  6           ID        PROPOSED CONDITION W/ MITIGATION
  7           IT       5                    289
  8           IO       7
  9           JR     FREQ    0.41    0.67    0.82    0.92    1.00

 10           KK     P1ab
 11           BA   0.0732
 12           LS        0      93
 13           UD     0.25
 14           IN       15
 15           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 16           PB     11.9
 17           PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 18           PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 19           PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 20           PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 21           PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 22           PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 23           PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 24           PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 25           PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 26           PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 27           KK     POND      P1
 28           KM   RUNOFF MITIGATION POND CALCULATION
 29           KO     0.00    1.00
 30           RS     1.00    ELEV    0.00
 31           SQ     0.00    0.00   79.01  127.22  161.63  189.91  346.18  620.35  969.97 1380.29
 32           SV    0.000   0.886   1.851   2.900   4.037   5.268   6.792   8.240   9.796  11.467
 33           SE     0.00    1.64    3.28    4.92    6.56    8.20   10.07   11.71   13.35   14.99

 34           KK      P3
 35           BA   0.1240
 36           LS        0    89.7
 37           UD     0.24
 38           IN       15
 39           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 40           PB     11.9
 41           PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 42           PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 43           PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 44           PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 45           PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 46           PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 47           PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 48           PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 49           PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 50           PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000
```



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

 51           KK     POND      P3
 52           KM   RUNOFF MITIGATION POND CALCULATION
 53           KO     0.00    1.00
 54           RS     1.00    ELEV    0.00
 55           SQ     0.00    0.00  208.79  315.35  394.08  459.52  641.94  946.14 1323.26 1759.08
 56           SV    0.000   0.774   1.822   2.549   3.560   4.660   5.179   7.064   8.453   9.949
 57           SE     0.00    1.64    3.28    4.92    6.56    8.20    9.74   11.38   13.02   14.66

 58           KK      P4
 59           BA   0.1229
 60           LS        0    86.9
 61           UD     0.19
 62           IN       15
 63           KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 64           PB     11.9
 65           PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 66           PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 67           PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 68           PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
```

```
 69          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 70          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 71          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 72          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 73          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 74          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 75          KK    COMB
 76          HC       2

 77          KK     P1c
 78          BA  0.0101
 79          LS       0      86
 80          UD    0.35
 81          IN      15
 82          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
 83          PB    11.9
 84          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
 85          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
 86          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
 87          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
 88          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
 89          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
 90          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
 91          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
 92          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
 93          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

 94          KK     P1d
 95          BA  0.0103
 96          LS       0    84.7
 97          UD    0.03
 98          IN      15
 99          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
100          PB    11.9
```



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

101          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
102          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
103          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
104          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
105          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
106          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
107          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
108          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
109          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
110          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

111          KK      E1
112          BA  0.4869
113          LS       0    85.7
114          UD    0.40
115          IN      15
116          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
117          PB    11.9
118          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
119          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
120          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
121          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
122          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
123          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
124          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
125          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
126          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
127          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

128          KK      E2
129          BA  0.2608
130          LS       0      87
131          UD    0.24
132          IN      15
133          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
134          PB    11.9
135          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
136          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
137          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
138          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
139          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
140          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
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141          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
142          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
143          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
144          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

145          KK    COMB
146          HC       6
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

147          KK     P4a
148          BA  0.0282
149          LS       0     89.4
150          UD    0.13
151          IN      15
152          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
153          PB    11.9
154          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
155          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
156          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
157          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
158          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
159          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
160          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
161          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
162          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
163          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

164          KK     P4b
165          BA  0.0918
166          LS       0      93
167          UD     .47
168          IN      15
169          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
170          PB    11.9
171          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
172          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
173          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
174          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
175          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
176          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
177          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
178          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
179          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
180          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

181          KK    POND      P4
182          KM   RUNOFF MITIGATION POND CALCULATION
183          KO    1.00    1.00
184          KS    1.00    ELEV    0.00
185          PQ    0.00   12.95   46.17   63.99   77.84  125.23  333.43  632.41 1001.68 1427.00
186          SV   0.000   1.408   2.915   4.526   6.246   8.078  10.029  12.103  14.305  16.640
187          WE    0.00    1.64    3.28    4.92    6.56    8.20    9.84   11.48   13.12   14.76

188          KK     P6c
189          BA  0.0470
190          LS       0      93
191          UD    0.35
192          IN      15
193          KM            RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
194          PB    11.9
195          PC   0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
196          PC   0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
197          PC   0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

198          PC   0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
199          PC   0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
200          PC   0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
201          PC   0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
202          PC   0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
203          PC   0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
204          PC   0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

205          KK    COMB
206          HC       7
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207          KK       E4
208          BA   0.0511
209          LS        0    84.9
210          UD     0.11
211          IN       15
212          KM             RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA
213          PB     11.9
214          PC    0.000   0.002   0.005   0.008   0.011   0.014   0.017   0.020   0.023   0.026
215          PC    0.029   0.032   0.035   0.038   0.041   0.044   0.048   0.052   0.056   0.060
216          PC    0.064   0.068   0.072   0.076   0.080   0.085   0.090   0.095   0.100   0.105
217          PC    0.110   0.115   0.120   0.126   0.133   0.140   0.147   0.155   0.163   0.172
218          PC    0.181   0.191   0.203   0.218   0.236   0.257   0.283   0.387   0.663   0.707
219          PC    0.735   0.758   0.776   0.791   0.804   0.815   0.825   0.834   0.842   0.849
220          PC    0.856   0.863   0.869   0.875   0.881   0.887   0.893   0.898   0.903   0.908
221          PC    0.913   0.918   0.922   0.926   0.930   0.934   0.938   0.942   0.946   0.950
222          PC    0.953   0.956   0.959   0.962   0.965   0.968   0.971   0.974   0.977   0.980
223          PC    0.983   0.986   0.989   0.992   0.995   0.998   1.000   0.000   0.000   0.000

224          KK     COMB
225          HC        3
226          ZZ
```

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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            *
*  RGMHEC2000               HEC-1.COM    *                    *      DAVIS, CALIFORNIA 95616         *
*  RUN DATE   01JUL05   TIME  16:11:55   *                    *         (916) 756-1104               *
*                                        *                    *                                      *
******************************************                    ****************************************
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                    HYDROLOGIC ANALYSIS
                    PROJECT: PALACIOS DE GURABO, GURABO, P.R.
                    BY: CA ENGINEERING - JUNE, 2005
                    TYPE II DISTRIBUTION
                    FREQUENCY OF OCCURRENCE: 2, 10, 25, 50 & 100 YEARS
                    PROPOSED CONDITION W/ MITIGATION

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

   IT          HYDROGRAPH TIME DATA
                    NMIN           5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        289  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME       0000  ENDING TIME
                    ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL     .08 HOURS
                  TOTAL TIME BASE   24.00 HOURS

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

   JP          MULTI-PLAN OPTION
                    NPLAN          1  NUMBER OF PLANS

   JR          MULTI-RATIO OPTION
                  RATIOS OF PRECIPITATION
                   .41       .67       .82       .92      1.00
```

```
10 KK      *      P1ab  *
           *            *
           **************
```

RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

```
14 IN        TIME DATA FOR INPUT TIME SERIES
                 JXMIN          15  TIME INTERVAL IN MINUTES
                 JXDATE     1    0  STARTING DATE
                 JXTIME          0  STARTING TIME

           SUBBASIN RUNOFF DATA

11 BA        SUBBASIN CHARACTERISTICS
                 TAREA         .07  SUBBASIN AREA

             PRECIPITATION DATA

16 PB            STORM       11.90  BASIN TOTAL PRECIPITATION

17 PI          INCREMENTAL PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

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12 LS        SCS LOSS RATE
                 STRTL          .15  INITIAL ABSTRACTION
                 CRVNBR       93.00  CURVE NUMBER
                 RTIMP          .00  PERCENT IMPERVIOUS AREA

13 UD        SCS DIMENSIONLESS UNITGRAPH
                 TLAG           .25  LAG
```

***

UNIT HYDROGRAPH
17 END-OF-PERIOD ORDINATES

21.	73.	117.	117.	91.	55.	34.	22.	14.	9.
5.	3.	2.	1.	1.	1.	0.			

TOTAL RAINFALL = 11.90, TOTAL LOSS = .86, TOTAL EXCESS = 11.04

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 416.	12.17		65.	22.	22.	22.
		(INCHES)	8.240	11.005	11.005	11.005
		(AC-FT)	32.	43.	43.	43.

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION Plab
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = .80, TOTAL EXCESS = 4.08

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 162.	12.17	(CFS)	25.	9.	8.	8.
		(INCHES)	3.155	4.064	4.064	4.064
		(AC-FT)	12.	16.	16.	16.

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION Plab
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = .84, TOTAL EXCESS = 7.14

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 275.	12.17	(CFS)	43.	14.	14.	14.
		(INCHES)	5.410	7.111	7.111	7.111
		(AC-FT)	21.	28.	28.	28.

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION Plab
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = .85, TOTAL EXCESS = 8.91

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 339.	12.17	(CFS)	53.	17.	17.	17.
		(INCHES)	6.701	8.879	8.879	8.879
		(AC-FT)	26.	35.	35.	35.

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION Plab
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.96, TOTAL LOSS = .89, TOTAL EXCESS = 10.07

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ 382.	12.17	(CFS)	60.	20.	20.	20.
		(INCHES)	7.560	10.059	10.059	10.059
		(AC-FT)	30.	39.	39.	39.

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION Plab
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 11.90, TOTAL LOSS = .86, TOTAL EXCESS = 11.04

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
		(CFS)				

```
+     416.     12.17                    65.          22.          22.          22.
                          (INCHES)    8.245       11.005       11.005       11.005
                           (AC-FT)       32.          43.          43.          43.

                        CUMULATIVE AREA =      .07 SQ MI

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

              **************
              *            *
  27 KK       *    POND    *          P1
              *            *
              **************
                          RUNOFF MITIGATION POND CALCULATION

  29 KO          OUTPUT CONTROL VARIABLES
                      IPRNT           3  PRINT CONTROL
                      IPLOT           1  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

              HYDROGRAPH ROUTING DATA

  30 RS          STORAGE ROUTING
                      NSTPS           1  NUMBER OF SUBREACHES
                       ITYP        ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC         .00  INITIAL CONDITION
                          X         .00  WORKING R AND D COEFFICIENT

  32 SV          STORAGE          .0        .9       1.9       2.9       4.0       5.3       6.8       8.2       9.8      11.5

  33 SE        ELEVATION         .00      1.64      3.28      4.92      6.56      8.20     10.07     11.71     13.35     14.99

  31 SQ        DISCHARGE          0.        0.       79.      127.      162.      190.      346.      620.      970.     1360.

                                                                                  ***

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

                          HYDROGRAPH AT STATION     POND
                           FOR PLAN 1, RATIO =  .41

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     125.     12.25                    25.           8.           8.           8.
                          (INCHES)    3.154        3.829        3.829        3.829
                           (AC-FT)       12.          15.          15.          15.

 PEAK STORAGE    TIME                              MAXIMUM AVERAGE STORAGE
                                          6-HR        24-HR        72-HR     24.00-HR
+  (AC-FT)       (HR)
        3.     12.25                     1.           1.           1.           1.

  PEAK STAGE     TIME                                MAXIMUM AVERAGE STAGE
                                          6-HR        24-HR        72-HR     24.00-HR
+   (FEET)       (HR)
      4.83     12.25                     2.20         1.31         1.31         1.31

                        CUMULATIVE AREA =      .07 SQ MI

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

                          HYDROGRAPH AT STATION     POND
                           FOR PLAN 1, RATIO =  .67

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                   (CFS)
+     184.     12.33                    43.          14.          14.          14.
                          (INCHES)    5.408        6.871        6.871        6.871
                           (AC-FT)       21.          27.          27.          27.
```

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (AC-FT)	(HR)				
5.	12.33	2.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (FEET)	(HR)				
7.87	12.33	2.75	1.63	1.63	1.63

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .82

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
		6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)				
		(CFS)			
+ 259.	12.25	55.	17.	17.	17.
		(INCHES)	8.636	8.636	8.636
		(AC-FT)	34.	34.	34.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (AC-FT)	(HR)				
4.	12.25	2.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (FEET)	(HR)				
9.23	12.25	3.72	1.77	1.77	1.77

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .82

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
		6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)				
		(CFS)			
+ 309.	12.25	[illegible]	19.	19.	19.
		(INCHES)	9.814	9.814	9.814
		(AC-FT)	[illegible]	38.	38.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (AC-FT)	(HR)				
4.	12.25	2.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE		
		6-HR	24-HR	72-HR	24.00-HR
+ (FEET)	(HR)				
9.63	12.25	3.15	1.84	1.84	1.84

CUMULATIVE AREA = .07 SQ MI

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

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW		
		6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)				
		(CFS)			
+ 349.	12.25	63.	21.	21.	21.
		(INCHES)	10.758	10.758	10.758
		(AC-FT)	42.	42.	42.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE		
		6-HR	24-HR	72-HR	24.00-HR

```
*   (AC-FT)      (HR)
         7.     12.25                                   [illegible]        1.          1.          1.

 PEAK STAGE     TIME                              MAXIMUM AVERAGE STAGE
                                        6-HR        24-HR       72-HR     24.00-HR
*   (FEET)      (HR)
      10.09     12.25                   [illegible]   1.90        1.90        1.90

                              CUMULATIVE AREA =      .07 SQ MI
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              ***************
              *             *
  34 KK       *        E3   *
              *             *
              ***************
                               RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

  38 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN         15   TIME INTERVAL IN MINUTES
                      JXDATE     1   0   STARTING DATE
                      JXTIME         0   STARTING TIME

               SUBBASIN RUNOFF DATA

  35 BA          SUBBASIN CHARACTERISTICS
                      TAREA        .12   SUBBASIN AREA

                 PRECIPITATION DATA

  40 PB               STORM      11.90   BASIN TOTAL PRECIPITATION

  41 PI            INCREMENTAL PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.01	.00	[illegible]
.01	.01	.01	.01	.01	.01	.01	.01	.01	[illegible]
.01	.01	.01	.09	.01	.01	.01	.01	.01	[illegible]
.01	.01	.01	.01	.01	.01	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00		

```
  36 LS          SCS LOSS RATE
                      STRTL        .1[illegible]   INITIAL ABSTRACTION
                      CRVNBR       [illegible]   CURVE NUMBER
                      RTIMP        [illegible]   PERCENT IMPERVIOUS AREA

  37 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .14   HRS

                                          ***

                                              UNIT HYDROGRAPH
                                          16 END-OF-PERIOD ORDINATES
     40.     [illegible]   [illegible]   200.   149.   [illegible]   4.   [illegible]   1.   [illegible]
```

```
                    9.        9.        1.        2.        1.        1.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.62

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
 (CFS)         (HR)
                              (CFS)
   708.       12.08                     108.         35.         35.         35.
                            (INCHES)   0.062     10.589      10.589      10.589
                            (AC-FT)     33.         70.         70.         70.

                            CUMULATIVE AREA =     .12 SQ MI

     ...            ...          ...          ...          ...

                            HYDROGRAPH AT STATION        P3
                              FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.15, TOTAL EXCESS =    3.73

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
 (CFS)         (HR)
                              (CFS)
   261.       12.08                      39.         12.         12.         12.
                            (INCHES)   2.935      3.714       3.714       3.714
                            (AC-FT)     19.         25.         25.         25.

                            CUMULATIVE AREA =     .12 SQ MI

     ...            ...          ...          ...          ...

                            HYDROGRAPH AT STATION        P3
                              FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.87, TOTAL LOSS =    1.13, TOTAL EXCESS =    6.74

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
 (CFS)         (HR)
                              (CFS)
   454.       12.08                      68.         22.         22.         22.
                            (INCHES)   5.200      6.720       6.720       6.720
                            (AC-FT)     34.         44.         44.         44.

                            CUMULATIVE AREA =     .12 SQ MI

     ...            ...          ...          ...          ...

                            HYDROGRAPH AT STATION        P3
                              FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.70, TOTAL LOSS =    1.15, TOTAL EXCESS =    8.50

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
 (CFS)         (HR)
                              (CFS)
   572.       12.08                      81.         28.         28.         28.
                            (INCHES)   6.504      8.475       8.475       8.475
                            (AC-FT)     41.         56.         56.         56.

                            CUMULATIVE AREA =     .12 SQ MI

     ...            ...          ...          ...          ...

                            HYDROGRAPH AT STATION        P3
                              FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.37, TOTAL EXCESS =    9.58

 PEAK FLOW     TIME                                MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.00-HR
 (CFS)         (HR)
                              (CFS)
   646.       12.08                      91.         32.         32.         32.
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                    (INCHES)      .170        9.649       9.649       9.649
                     (AC-FT)       48.         64.         64.         64.

                   CUMULATIVE AREA =      .12 SQ MI

   ***          ...          ...          ...          ...

                   HYDROGRAPH AT STATION       P3
                     FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =   11.00, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.62

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
  (CFS)        (HR)
                        (CFS)
+    708.     12.08                 108.         35.         35.         35.
                    (INCHES)      8.062      10.589      10.589      10.589
                     (AC-FT)       53.         70.         70.         70.

                   CUMULATIVE AREA =      .12 SQ MI
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          ************
          *          *
 51 KK    *    POND  *          P3
          *          *
          ************
                   BIOWATE MITIGATION POND CALCULATION

 53 KO        OUTPUT CONTROL VARIABLES
                IPRNT          3  PRINT CONTROL
                IPLOT          1  PLOT CONTROL
                QMCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

 54 RS        STORAGE ROUTING
                NSTPS          1  NUMBER OF SUBREACHES
                 ITYP       ELEV  TYPE OF INITIAL CONDITION
               RSVRIC        .00  INITIAL CONDITION
                    X        .00  WORKING R AND D COEFFICIENT

 56 SV          STORAGE       .0         .8        1.6        2.4        3.2        4.0        4.8        5.6        6.4        7.2

 57 SE        ELEVATION      .00       1.64       3.28       4.92       6.56       8.20       9.84      11.48      13.12      14.76

 55 SQ        DISCHARGE       0.         0.       209.       515.       894.      1[illegible].      647.      [illegible].      [illegible].      [illegible].

                                                                    ...

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     1323. TO     1754.
               THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
               THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH).

   ***          ...          ...          ...          ...

                   HYDROGRAPH AT STATION     POND
                     FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                        (CFS)
-    244.     12.17                  18.         12.         12.         12.
                    (INCHES)      1.595       3.595       3.595       3.595
                     (AC-FT)       19.         24.         24.         24.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                    6-HR       24-HR       72-HR     24.00-HR
+ (AC-FT)      (HR)
      2.      12.17                   2.          1.          1.          1.
```

PEAK STAGE (FEET)	TIME (HR)		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.89	12.17		1.96	1.23	1.23	1.23
		CUMULATIVE AREA =	.12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .67

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
		(CFS)				
691.	12.25		69.	32.	32.	22.
		(INCHES)	5.200	6.599	6.599	6.599
		(AC-FT)	38.	44.	44.	44.

PEAK STORAGE (AC-FT)	TIME (HR)		MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
4.	12.25		1.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
8.74	12.25		2.30	1.48	1.48	1.48
		CUMULATIVE AREA =	.12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .80

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
		(CFS)				
903.	12.25		87.	38.	38.	29.
		(INCHES)	6.904	8.352	8.352	8.352
		(AC-FT)	49.	55.	55.	55.

PEAK STORAGE (AC-FT)	TIME (HR)		MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
5.	12.25		1.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.17	12.25		2.53	1.60	1.60	1.60
		CUMULATIVE AREA =	.12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .97

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
		(CFS)				
981.	12.25		92.	32.	32.	32.
		(INCHES)	7.270	9.526	9.526	9.526
		(AC-FT)	49.	63.	63.	63.

PEAK STORAGE (AC-FT)	TIME (HR)		MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
5.	12.25		1.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR

```
+     (FEET)        (HR)
        3.23       12.25                        1.68          1.67          1.67          1.67

                        CUMULATIVE AREA =       .12 SQ MI

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

                         HYDROGRAPH AT STATION     POND
                           FOR PLAN 1, RATIO = 1.00

  PEAK FLOW       TIME                                    MAXIMUM AVERAGE FLOW
                                                 6-HR          24-HR         72-HR       24.00-HR
+    (CFS)        (HR)
                                (CFS)
+      647.       12.17                          108.           35.           35.           35.
                              (INCHES)          8.062        10.466        10.466        10.466
                               (AC-FT)            53.           69.           69.           69.

 PEAK STORAGE    TIME                                     MAXIMUM AVERAGE STORAGE
                                                 6-HR          24-HR         72-HR       24.00-HR
+   (AC-FT)       (HR)
          6.      12.17                            1.            1.            1.            1.

  PEAK STAGE      TIME                                    MAXIMUM AVERAGE STAGE
                                                 6-HR          24-HR         72-HR       24.00-HR
+    (FEET)       (HR)
        3.77      12.17                          1.76          1.72          1.72          1.72

                        CUMULATIVE AREA =       .12 SQ MI


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

              ***************
              *             *
 58 KK        *      E3     *
              *             *
              ***************

                             RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 62 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15   TIME INTERVAL IN MINUTES
                     JXDATE      1   0   STARTING DATE
                     JXTIME          0   STARTING TIME

               SUBBASIN RUNOFF DATA

 59 BA          SUBBASIN CHARACTERISTICS
                     TAREA          .12   SUBBASIN AREA

                PRECIPITATION DATA

 64 PB                STORM        15.90   BASIN TOTAL PRECIPITATION

 65 PI            INCREMENTAL PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
[illegible]	[illegible]	.11	.01	.01	[illegible]	[illegible]	.01	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	.09	.01	.01	.01	.01	.01	.01
.01	.01	.11	.21	.01	.21	.01	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00

 60 LS        SCS LOSS RATE
                SIRTL        .30  INITIAL ABSTRACTION
              CRVNBR      56.90  CURVE NUMBER
              RTIMP        .00  PERCENT IMPERVIOUS AREA

 61 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG        .19  LAG

                                                  ***

                                                UNIT HYDROGRAPH
                                            13 END-OF-PERIOD ORDINATES
            67.      215.      294.      189.      100.       57.       32.       18.       10.        5.
             3.        2.        1.

   TOTAL RAINFALL =   11.30, TOTAL LOSS =    1.04, TOTAL EXCESS =   10.26

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR    24.00-HR
+   (CFS)      (HR)
                         (CFS)
+     776.    12.08                  104.         34.         34.         34.
                       (INCHES)     7.875      10.237      10.237      10.237
                       (AC-FT)       52.         67.         67.         67.

                      CUMULATIVE AREA =     .12 SQ MI

     ...          ...          ...          ...          ***

                      HYDROGRAPH AT STATION       E3
                       FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.63, TOTAL LOSS =    1.44, TOTAL EXCESS =    3.44

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR    24.00-HR
+   (CFS)      (HR)
                         (CFS)
+     276.    12.08                   36.         11.         11.         11.
                       (INCHES)     2.743       3.433       3.433       3.433
                       (AC-FT)       18.         23.         23.         23.

                      CUMULATIVE AREA =     .12 SQ MI

     ...          ...          ...          ...          ***

                      HYDROGRAPH AT STATION       E3
                       FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.57, TOTAL LOSS =    1.16, TOTAL EXCESS =    6.41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR    24.00-HR
+   (CFS)      (HR)
                         (CFS)
+     438.    12.08                   68.         21.         21.         21.
                       (INCHES)     5.001       6.394       6.394       6.394
                       (AC-FT)       33.         42.         42.         42.

                      CUMULATIVE AREA =     .12 SQ MI

     ...          ...          ...          ...          ***

                      HYDROGRAPH AT STATION       E3
                       FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =    1.60, TOTAL EXCESS =    8.16

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR    24.00-HR
```

PEAK FLOW (CFS)	TIME (HR)					
825.	12.08	(CFS)	83.	27.	27.	27.
		(INCHES)	8.309	8.134	8.134	8.134
		(AC-FT)	41.	53.	53.	53.

CUMULATIVE AREA = .12 SQ MI

...

HYDROGRAPH AT STATION E3
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 1.62, TOTAL EXCESS = 9.33

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
708.	12.08	(CFS)	95.	31.	31.	31.
		(INCHES)	7.140	9.301	9.301	9.301
		(AC-FT)	47.	61.	61.	61.

CUMULATIVE AREA = .12 SQ MI

...

HYDROGRAPH AT STATION E3
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 11.10, TOTAL LOSS = 1.64, TOTAL EXCESS = 10.26

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
776.	12.08	(CFS)	104.	34.	34.	34.
		(INCHES)	7.837	10.237	10.237	10.237
		(AC-FT)	52.	67.	67.	67.

CUMULATIVE AREA = .12 SQ MI

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:    COMB    :
:            :
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HYDROGRAPH COMBINATION
COMB 2 NUMBER OF HYDROGRAPHS TO COMBINE

...

HYDROGRAPH AT STATION COMB
FOR PLAN 1, RATIO = .61

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
494.	12.08	(CFS)	75.	23.	23.	23.
		(INCHES)	7.664	9.514	9.514	9.514
		(AC-FT)	47.	46.	46.	46.

CUMULATIVE AREA = .27 SQ MI

...

HYDROGRAPH AT STATION COMB
FOR PLAN 1, RATIO = .67

```
  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+     846.     12.08                 135.          43.          43.          43.
                                (INCHES)        5.101        6.497        6.497        6.497
                                 (AC-FT)         67.          86.          86.          86.

                              CUMULATIVE AREA =     .25 SQ MI


      ...             ...             ...             ...             ...

                          HYDROGRAPH AT STATION     COMB
                            FOR PLAN 1, RATIO =  .82

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+    1036.     12.08                 170.          55.          55.          55.
                                (INCHES)        6.407        8.244        8.244        8.244
                                 (AC-FT)         84.         109.         109.         109.

                              CUMULATIVE AREA =     .25 SQ MI


      ...             ...             ...             ...             ...

                          HYDROGRAPH AT STATION     COMB
                            FOR PLAN 1, RATIO =  .92

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+    1221.     12.17                 193.          62.          62.          62.
                                (INCHES)        7.275        9.414        9.414        9.414
                                 (AC-FT)         96.         124.         124.         124.

                              CUMULATIVE AREA =     .25 SQ MI


      ...             ...             ...             ...             ...

                          HYDROGRAPH AT STATION     COMB
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                                   (CFS)
+    1308.     12.17                 212.          69.          69.          69.
                                (INCHES)        7.969       10.352       10.352       10.352
                                 (AC-FT)        105.         136.         136.         136.

                              CUMULATIVE AREA =     .25 SQ MI


... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...


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                 .            .
  ST KK          .     PIC    .
                 .            .
                 ..............
                                  RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

  01 IN            TIME DATA FOR INPUT TIME SERIES
                        JXMIN          15  TIME INTERVAL IN MINUTES
                       JXDATE       1   5  STARTING DATE
                       JXTIME           0  STARTING TIME

                SUBBASIN RUNOFF DATA

  70 BA            SUBBASIN CHARACTERISTICS
                        TAREA         .01  SUBBASIN AREA
```

PRECIPITATION DATA

83 PB STORM 11.90 BASIN TOTAL PRECIPITATION

84 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.03
.09	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

79 LS SCS LOSS RATE

STRTL .33 INITIAL ABSTRACTION

CRVNBR 84.00 CURVE NUMBER

RTIMP .00 PERCENT IMPERVIOUS AREA

80 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .35 LAG

***

UNIT HYDROGRAPH

23 END-OF-PERIOD ORDINATES

1.	4.	9.	12.	12.	11.	9.	[illegible]	4.	[illegible]
2.	1.	1.	1.	1.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
0.	[illegible]	0.							

TOTAL RAINFALL = 11.90, TOTAL LOSS = 1.75, TOTAL EXCESS = 10.15

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 47.	12.25		8.	3.	3.	3.
		(INCHES)	7.806	10.093	10.093	10.093
		(AC-FT)	4.	5.	5.	5.

CUMULATIVE AREA = .01 SQ MI

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

HYDROGRAPH AT STATION 81c

FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.[illegible], TOTAL LOSS = 1.50, TOTAL EXCESS = 3.35

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 16.	12.25		1.	1.	1.	1.
		(INCHES)	[illegible]	3.330	3.334	[illegible]
		(AC-FT)	1.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

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...                 ...                 ...                 ...                 ...

                     HYDROGRAPH AT STATION        P1c
                       FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.97, TOTAL LOSS =    1.67, TOTAL EXCESS =    6.31

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    30.       12.25                 5.           2.           2.           2.
                        (INCHES)   4.932        6.269        6.269        6.269
                         (AC-FT)     3.           3.           3.           3.

                       CUMULATIVE AREA =      .01 SQ MI

...                 ...                 ...                 ...                 ...

                     HYDROGRAPH AT STATION        P1c
                       FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.71, TOTAL EXCESS =    8.04

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    38.       12.25                 7.           2.           2.           2.
                        (INCHES)   6.239        8.000        8.000        8.000
                         (AC-FT)     3.           4.           4.           4.

                       CUMULATIVE AREA =      .01 SQ MI

...                 ...                 ...                 ...                 ...

                     HYDROGRAPH AT STATION        P1c
                       FOR PLAN 1, RATIO =  .91

  TOTAL RAINFALL =  10.85, TOTAL LOSS =    1.74, TOTAL EXCESS =    9.21

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    43.       12.25                 9.           2.           2.           2.
                        (INCHES)   7.110        9.161        9.161        9.161
                         (AC-FT)     4.           5.           5.           5.

                       CUMULATIVE AREA =      .01 SQ MI

...                 ...                 ...                 ...                 ...

                     HYDROGRAPH AT STATION        P1c
                       FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =  11.91, TOTAL LOSS =    1.75, TOTAL EXCESS =   10.15

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    47.       12.25                 9.           3.           3.           3.
                        (INCHES)   7.806       10.093       10.093       10.093
                         (AC-FT)     4.           5.           5.           5.

                       CUMULATIVE AREA =      .01 SQ MI

... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

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*4 KK       *      P1A   *
            *              *
            ****************
                                   RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

33 IN           TIME DATA FOR INPUT TIME SERIES
                     JXMIN         15  TIME INTERVAL IN MINUTES
                     JXDATE     1   0  STARTING DATE
                     JXTIME         0  STARTING TIME

             SUBBASIN RUNOFF DATA

95 BA           SUBBASIN CHARACTERISTICS
                     TAREA         .01  SUBBASIN AREA

                PRECIPITATION DATA

1   PB               STORM       11.90  BASIN TOTAL PRECIPITATION

101 PI            INCREMENTAL PRECIPITATION PATTERN
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .01      .00      .01
                     .01      .01      .01      .01      .01      .01      .01      .01      .01      .01
                     .03      .03      .09      .09      .01      .01      .01      .01      .01      .01
                     .01      .01      .01      .01      .01      .01      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .01      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                     .00      .00      .00      .00      .00      .00      .00      .00

96 LS           SCS LOSS RATE
                     STRTL         .46  INITIAL ABSTRACTION
                     CRVNBR      84.00  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

97 UD           SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .03  LAG

                                                                  ***

                                                                 UNIT HYDROGRAPH
                                                               1 END-OF-PERIOD ORDINATES
              59.          17.          3.          1.          0.

      TOTAL RAINFALL =    11.90, TOTAL LOSS =     1.92, TOTAL EXCESS =     9.98

  PEAK FLOW      TIME                               MAXIMUM AVERAGE FLOW
                                         6-HR         24-HR         72-HR       24.00-HR
+   (CFS)        (HR)
                                (CFS)
+     83.       12.00                     9.            3.            1.            1.
                              (INCHES)   .714         9.871         9.871         9.871
                               (AC-FT)     4.            5.            5.            5.

                              CUMULATIVE AREA =     .01 SQ MI

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

                         HYDROGRAPH AT STATION       P1A
                           FOR PLAN 1, RATIO =   .41
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    TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.65, TOTAL EXCESS =    3.23

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     28.       12.00                 3.           1.           1.           1.
                                (INCHES)         2.585        3.225        3.225        3.225
                                 (AC-FT)            1.           2.           2.           2.

                                CUMULATIVE AREA =     .01 SQ MI

      ...                 ...                 ...                 ...                 ...

                                HYDROGRAPH AT STATION       P1d
                                  FOR PLAN 1, RATIO =  .67

    TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.82, TOTAL EXCESS =    6.15

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     53.       12.00                 5.           2.           2.           2.
                                (INCHES)         4.836        6.148        6.148        6.148
                                 (AC-FT)            3.           3.           3.           3.

                                CUMULATIVE AREA =     .01 SQ MI

      ...                 ...                 ...                 ...                 ...

                                HYDROGRAPH AT STATION       P1d
                                  FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =    9.56, TOTAL LOSS =    1.68, TOTAL EXCESS =    7.88

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     67.       12.00                 7.           2.           2.           2.
                                (INCHES)         6.143        7.876        7.876        7.876
                                 (AC-FT)            3.           4.           4.           4.

                                CUMULATIVE AREA =     .01 SQ MI

      ...                 ...                 ...                 ...                 ...

                                HYDROGRAPH AT STATION       P1d
                                  FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =   10.96, TOTAL LOSS =    1.90, TOTAL EXCESS =    9.04

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     76.       12.00                 8.           3.           3.           3.
                                (INCHES)         7.016        9.038        9.038        9.038
                                 (AC-FT)            4.           5.           5.           5.

                                CUMULATIVE AREA =     .01 SQ MI

      ...                 ...                 ...                 ...                 ...

                                HYDROGRAPH AT STATION       P1d
                                  FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =   11.93, TOTAL LOSS =    1.92, TOTAL EXCESS =    9.98

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     81.       12.00                 9.           3.           3.           3.
                                (INCHES)         7.718        9.971        9.971        9.971
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              ?AC-.            4.          5.          5.          5.

              CUMULATIVE AREA =      . [illegible] MI

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

              ***************
              *             *
111 KK        *      E1     *
              *             *
              ***************

                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

115 IN          TIME DATA FOR INPUT TIME SERIES
                   JXMIN        15   TIME INTERVAL IN MINUTES
                   JXDATE     1   0   STARTING DATE
                   JXTIME          0   STARTING TIME

             SUBBASIN RUNOFF DATA

112 BA          SUBBASIN CHARACTERISTICS
                   TAREA          .40   SUBBASIN AREA

                PRECIPITATION DATA

117 PB             STORM        11.90   BASIN TOTAL PRECIPITATION

118 PI             INCREMENTAL PRECIPITATION PATTERN
```

.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.01	.00	[illegible]
.01	[illegible]	.01	.01	.01	.01	.01	.01	[illegible]	[illegible]
.03	[illegible]	.09	.09	.01	.01	.01	.01	.01	[illegible]
.01	[illegible]	.01	.01	.01	.01	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	[illegible]	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	[illegible]	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00	.00	[illegible]
.00	.00	.00	.00	.00	.00	.00	.00		

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113 LS          SCS LOSS RATE
                   STRTL          .??   INITIAL ABSTRACTION
                   CRVNBR       ??.?0   CURVE NUMBER
                   RTIMP          .??   PERCENT IMPERVIOUS AREA

114 UD          SCS DIMENSIONLESS UNITGRAPH
                   TLAG           .40   LAG

                                              ***

                                        UNIT HYDROGRAPH
                                    26 END-OF-PERIOD ORDINATES
         [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]
         [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  12.  [illegible]
         [illegible]  [illegible]  [illegible]  [illegible]  [illegible]  [illegible]

   TOTAL RAINFALL =   11.??, TOTAL LOSS =   1.79, TOTAL EXCESS =   10.11

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

PEAK FLOW (CFS)	TIME (HR)		6-HR	24-HR	72-HR	24.00-HR
2109.	12.25	(CFS)	400.	132.	132.	132.
		(INCHES)	7.793	10.045	10.045	10.045
		(AC-FT)	202.	261.	261.	261.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = 1.55, TOTAL EXCESS = 3.32

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
721.	12.25	(CFS)	139.	43.	43.	43.
		(INCHES)	2.655	3.300	3.300	3.300
		(AC-FT)	89.	86.	86.	86.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.97, TOTAL LOSS = 1.70, TOTAL EXCESS = 6.27

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1336.	12.25	(CFS)	257.	82.	82.	82.
		(INCHES)	4.909	6.228	6.228	6.228
		(AC-FT)	167.	162.	162.	162.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 1.75, TOTAL EXCESS = 8.01

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1689.	12.25	(CFS)	325.	104.	104.	104.
		(INCHES)	6.215	7.955	7.955	7.955
		(AC-FT)	161.	207.	207.	207.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 1.78, TOTAL EXCESS = 9.17

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1922.	12.25	(CFS)	371.	119.	119.	119.
		(INCHES)	7.098	9.114	9.114	9.114
		(AC-FT)	184.	237.	237.	237.

CUMULATIVE AREA = .49 SQ MI

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

                     HYDROGRAPH AT STATION        E1
                       FOR PLAN 1, RATIO = 1.00

     TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.79, TOTAL EXCESS =   10.11

   PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                   6-HR         24-HR         72-HR       24.00-HR
 +   (CFS)        (HR)
                       (CFS)
 +    2109.       12.25              408.          132.          132.          132.
                      (INCHES)      7.763        10.045        10.045        10.045
                       (AC-FT)       202.          261.          261.          261.

                      CUMULATIVE AREA =      .49 SQ MI

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

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              *             *
 128 KK       *      E2     *
              *             *
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                                RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 132 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                      JXDATE      1   0  STARTING DATE
                      JXTIME          0  STARTING TIME

                SUBBASIN RUNOFF DATA

 129 BA          SUBBASIN CHARACTERISTICS
                      TAREA          .2[illegible]  SUBBASIN AREA

                 PRECIPITATION DATA

 134 PB               STORM       11.90  BASIN TOTAL PRECIPITATION

 135 PI            INCREMENTAL PRECIPITATION PATTERN
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                       .01        .01        .01        .01        .01        .01        .01        .01        .01        .01
                       .01        .09        .09        .09        .01        .01        .01        .01        .01        .01
                       .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
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 130 LS          SCS LOSS RATE
                      STRTL         [illegible]  INITIAL ABSTRACTION
                      CRVNBR        [illegible]  CURVE NUMBER
                      RTIMP         [illegible]  PERCENT IMPERVIOUS AREA
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111 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG        .24  LAG

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                                                                    UNIT HYDROGRAPH
                                                                 16 END-OF-PERIOD ORDINATES
                 83.      289.      439.      420.      313.      182.      114.      70.      44.      27.
                 17.       10.        6.        4.        3.        1.

    TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.62, TOTAL EXCESS =   10.28

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                 (CFS)
+   1461.      12.08                     221.         72.         72.         72.
                                (INCHES)  7.882     10.242      10.242      10.242
                                 (AC-FT)  110.       142.        142.        142.

                              CUMULATIVE AREA =     .26 SQ MI

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

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO =  .41

    TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.43, TOTAL EXCESS =    3.45

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                 (CFS)
+    514.      12.17                      77.         24.         24.         24.
                                (INCHES)  2.740      3.440       3.440       3.440
                                 (AC-FT)  38.         48.         48.         48.

                              CUMULATIVE AREA =     .26 SQ MI

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

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO =  .67

    TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.55, TOTAL EXCESS =    6.42

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                 (CFS)
+    934.      12.08                     140.         45.         45.         45.
                                (INCHES)  5.000      6.400       6.400       6.400
                                 (AC-FT)  70.         89.         89.         89.

                              CUMULATIVE AREA =     .26 SQ MI

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

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =    9.74, TOTAL LOSS =    1.59, TOTAL EXCESS =    8.17

  PEAK FLOW      TIME                                MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.00-HR
+   (CFS)        (HR)
                                 (CFS)
+   1175.      12.08                     177.         57.         57.         57.
                                (INCHES)  6.116      8.140       8.140       8.140
                                 (AC-FT)  88.        113.        113.        113.

                              CUMULATIVE AREA =     .26 SQ MI

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

                          HYDROGRAPH AT STATION        E2
                            FOR PLAN 1, RATIO =  .92
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   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.61, TOTAL EXCESS =    9.34

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1334.      12.08                 202.         65.          65.          65.
                        (INCHES)    7.186        9.306        9.306        9.306
                         (AC-FT)    100.         129.         129.         129.

                        CUMULATIVE AREA =      .26 SQ MI

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

                        HYDROGRAPH AT STATION       E2
                          FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.62, TOTAL EXCESS =   10.28

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1461.      12.08                 221.         72.          72.          72.
                        (INCHES)    7.882       10.242       10.242       10.242
                         (AC-FT)    110.         142.         142.         142.

                        CUMULATIVE AREA =      .26 SQ MI
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145 KK          ************
                *          *
                *   COMB   *
                *          *
                ************

146 HC          HYDROGRAPH COMBINATION
                  ICOMP          0   NUMBER OF HYDROGRAPHS TO COMBINE

                                                                  ...

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

                        HYDROGRAPH AT STATION      COMB
                          FOR PLAN 1, RATIO =   .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1795.      12.17                 322.        100.         100.         100.
                        (INCHES)    2.750        3.417        3.417        3.417
                         (AC-FT)    160.         198.         198.         198.

                        CUMULATIVE AREA =     1.09 SQ MI

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

                        HYDROGRAPH AT STATION      COMB
                          FOR PLAN 1, RATIO =   .67

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   3182.      12.17                 536.        186.         186.         186.
                        (INCHES)    5.007        6.373        6.373        6.373
                         (AC-FT)    292.         370.         370.         370.

                        CUMULATIVE AREA =     1.09 SQ MI

     ***            ***            ***            ***            ***
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                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   3986.      12.17                739.         237.         237.         237.
                          (INCHES)  6.312        8.110        8.110        8.110
                          (AC-FT)   466.         471.         471.         471.

                         CUMULATIVE AREA =    1.09 SQ MI

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

                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO =  .92

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   4608.      12.17                841.         271.         271.         271.
                          (INCHES)  7.182        9.275        9.275        9.275
                          (AC-FT)   417.         538.         538.         538.

                         CUMULATIVE AREA =    1.09 SQ MI

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

                    HYDROGRAPH AT STATION      COMB
                      FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   5088.      12.17                922.         299.         299.         299.
                          (INCHES)  7.877       10.210       10.210       10.210
                          (AC-FT)   457.         593.         593.         593.

                         CUMULATIVE AREA =    1.09 SQ MI


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


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147 RY      .      P44   .
            .            .
            ..............
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

151 IN          TIME DATA FOR INPUT TIME SERIES
                     JTMIN          10  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

148 BA          SUBBASIN CHARACTERISTICS
                     TAREA        .09  SUBBASIN AREA

                PRECIPITATION DATA

153 PB               STORM      11.40  BASIN TOTAL PRECIPITATION

154 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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149 LS          SCS LOSS RATE
                  STRTL        .24  INITIAL ABSTRACTION
                 CRVNBR      89.40  CURVE NUMBER
                  RTIMP        .00  PERCENT IMPERVIOUS AREA

150 UD          SCS DIMENSIONLESS UNITGRAPH
                  TLAG        .13  LAG

                                                  ...

                                              UNIT HYDROGRAPH
                                          10 END-OF-PERIOD ORDINATES
              36.     80.     58.     25.     11.      5.      2.      1.      1.      0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.31, TOTAL EXCESS =   10.59

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   200.      12.00          24.          8.          8.          8.
                         (INCHES)     8.045      10.568      10.568      10.568
                          (AC-FT)       12.         16.         16.         16.

                         CUMULATIVE AREA =     .03 SQ MI

    ...         ...         ...         ...         ...

                         HYDROGRAPH AT STATION      94a
                           FOR PLAN 1, RATIO =   .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =    1.18, TOTAL EXCESS =    3.70

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    74.      12.00           9.          3.          3.          3.
                         (INCHES)     2.915       3.690       3.690       3.690
                          (AC-FT)        4.          6.          6.          6.

                         CUMULATIVE AREA =     .03 SQ MI

    ...         ...         ...         ...         ...

                         HYDROGRAPH AT STATION      94a
                           FOR PLAN 1, RATIO =   .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.27, TOTAL EXCESS =    6.71

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.00-HR
  (CFS)       (HR)
                          (CFS)
   130.      12.00          28.          5.          5.          5.
                         (INCHES)     5.181       6.696       6.696       6.696
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                    (AC-FT)        8.          10.          10.          10.

                    CUMULATIVE AREA =      .03 SQ MI

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

                     HYDROGRAPH AT STATION      P4a
                       FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.29, TOTAL EXCESS =    8.47

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    162.      12.00                 20.           6.           6.           6.
                         (INCHES)   6.486        8.452        8.452        8.452
                         (AC-FT)     10.          13.          13.          13.

                         CUMULATIVE AREA =      .03 SQ MI

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

                     HYDROGRAPH AT STATION      P4a
                       FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.30, TOTAL EXCESS =    9.64

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    183.      12.00                 22.           7.           7.           7.
                         (INCHES)   7.353        9.627        9.627        9.627
                         (AC-FT)     11.          14.          14.          14.

                         CUMULATIVE AREA =      .03 SQ MI

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

                     HYDROGRAPH AT STATION      P4a
                       FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.31, TOTAL EXCESS =   10.59

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    200.      12.00                 24.           8.           8.           8.
                         (INCHES)   8.045       10.568       10.568       10.568
                         (AC-FT)     12.          16.          16.          16.

                         CUMULATIVE AREA =      .03 SQ MI


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

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            *           *
164 KK      *     P4b   *
            *           *
            *************
                                 RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

166 IN          TIME DATA FOR INPUT TIME SERIES
                      JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE      1    0  STARTING DATE
                     JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

165 BA          SUBBASIN CHARACTERISTICS
                      TAREA        .03  SUBBASIN AREA
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PRECIPITATION DATA

170 PB STORM 11.90 BASIN TOTAL PRECIPITATION

171 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00		

149 LS SCS LOSS RATE

STRTL .15 INITIAL ABSTRACTION
CRVNBR 93.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

167 UD SCS DIMENSIONLESS UNITGRAPH

TLAG .47 LAG

***

UNIT HYDROGRAPH
10 END-OF-PERIOD ORDINATES

8.	19.	39.	64.	81.	87.	84.	74.	62.	46.
34.	26.	21.	16.	12.	9.	7.	5.	4.	3.
2.	2.	1.	1.	1.	1.	1.	0.	0.	0.

TOTAL RAINFALL = 11.90, TOTAL LOSS = .86, TOTAL EXCESS = 11.04

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
(CFS)	(HR)					
		(CFS)				
380.	12.33		81.	27.	27.	27.
		(INCHES)	8.239	10.965	10.965	10.965
		(AC-FT)	40.	54.	54.	54.

CUMULATIVE AREA = .09 SQ MI

... ... ***

HYDROGRAPH AT STATION P4b
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = .80, TOTAL EXCESS = 4.08

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
(CFS)	(HR)					
		(CFS)				
147.	12.33		31.	10.	10.	10.
		(INCHES)	3.152	4.048	4.048	4.048
		(AC-FT)	15.	20.	20.	20.

CUMULATIVE AREA = .09 SQ MI

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...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P4b
                     FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.97, TOTAL LOSS =    .84, TOTAL EXCESS =   7.14

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    250.     12.33                 53.          17.          17.          17.
                         (INCHES)  5.405       7.085       7.085       7.085
                          (AC-FT)    28.          35.          35.          35.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P4b
                     FOR PLAN 1, RATIO =  .92

  TOTAL RAINFALL =   9.76, TOTAL LOSS =    .85, TOTAL EXCESS =   8.91

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    309.     12.33                 66.          22.          22.          22.
                         (INCHES)  6.696       8.847       8.847       8.847
                          (AC-FT)    33.          43.          43.          43.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P4b
                     FOR PLAN 1, RATIO =  .92

  TOTAL RAINFALL =  10.95, TOTAL LOSS =    .85, TOTAL EXCESS =  10.09

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    349.     12.33                 75.          25.          25.          25.
                         (INCHES)  7.554      10.023      10.023      10.023
                          (AC-FT)    37.          49.          49.          49.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P4b
                     FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =  11.80, TOTAL LOSS =    .86, TOTAL EXCESS =  11.94

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    380.     12.33                 81.          27.          27.          27.
                         (INCHES)  8.139      10.965      10.965      10.965
                          (AC-FT)    40.          54.          54.          54.

                     CUMULATIVE AREA =     .09 SQ MI

... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

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181 KK      *    POND   *          P4
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                    RUNOFF MITIGATION POND CALCULATION

183 PC        OUTPUT CONTROL VARIABLES
                  IPRNT          3  PRINT CONTROL
                  IPLOT          1  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

184 RS        STORAGE ROUTING
                  NSTPS          1  NUMBER OF SUBREACHES
                   ITYP       ELEV  TYPE OF INITIAL CONDITION
                 RSVRIC        .00  INITIAL CONDITION
                      X        .00  WORKING R AND D COEFFICIENT

186 SV          STORAGE        .0      1.4      2.9      4.5      6.2      8.1     10.0     12.1     14.3     16.6

187 SE        ELEVATION       .00     1.64     3.28     4.92     6.56     8.20     9.84    11.48    13.12    14.76

188 SQ        DISCHARGE        0.      13.      46.      64.      78.     125.     333.     633.    1062.    1127.

                                                                                                  ***

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

                HYDROGRAPH AT STATION     POND
                 FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                              (CFS)
+    74.      12.83            30.         10.         10.          10.
                        (INCHES)       3.088       3.970       3.970        3.970
                         (AC-FT)         15.         19.         19.          19.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.00-HR
+ (AC-FT)      (HR)
     6.       12.83             2.          1.          1.           1.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR       72-HR     24.00-HR
+  (FEET)      (HR)
    6.11      12.83            2.67         .94         .94          .94

                        CUMULATIVE AREA =     .09 SQ MI

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

                HYDROGRAPH AT STATION     POND
                 FOR PLAN 1, RATIO =  .67

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   188.      12.58            53.         17.         17.          17.
                        (INCHES)       5.341       6.956       6.956        6.956
                         (AC-FT)         26.         34.         34.          34.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR       24-HR       72-HR     24.00-HR
+ (AC-FT)      (HR)
     9.       12.58             4.          1.          1.           1.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                     6-HR       24-HR       72-HR     24.00-HR
+  (FEET)      (HR)
    8.88      12.58            3.91        1.48        1.48         1.48

                        CUMULATIVE AREA =     .09 SQ MI

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                       HYDROGRAPH AT STATION      POND
                        FOR PLAN 1, RATIO =  .82

  PEAK FLOW      TIME                                  MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR       24.00-HR
+   (CFS)        (HR)
                           (CFS)
+     261.      12.50                      66.          21.          21.          21.
                           (INCHES)      6.649        8.689        8.689        8.689
                           (AC-FT)         33.          43.          43.          43.

 PEAK STORAGE    TIME                                MAXIMUM AVERAGE STORAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+  (AC-FT)       (HR)
        9.      12.50                       4.           2.           2.           2.

  PEAK STAGE     TIME                                 MAXIMUM AVERAGE STAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+   (FEET)       (HR)
      9.27      12.50                     4.32         1.71         1.71         1.71

                         CUMULATIVE AREA =       .09 SQ MI

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

                       HYDROGRAPH AT STATION      POND
                        FOR PLAN 1, RATIO =  .92

  PEAK FLOW      TIME                                  MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR       24.00-HR
+   (CFS)        (HR)
                           (CFS)
+     308.      12.50                      74.          24.          24.          24.
                           (INCHES)      7.508        9.847        9.847        9.847
                           (AC-FT)         37.          48.          48.          48.

 PEAK STORAGE    TIME                                MAXIMUM AVERAGE STORAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+  (AC-FT)       (HR)
       10.      12.50                       4.           2.           2.           2.

  PEAK STAGE     TIME                                 MAXIMUM AVERAGE STAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+   (FEET)       (HR)
      9.64      12.50                     4.57         1.85         1.85         1.85

                         CUMULATIVE AREA =       .09 SQ MI

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

                       HYDROGRAPH AT STATION      POND
                        FOR PLAN 1, RATIO = 1.00

  PEAK FLOW      TIME                                  MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR       24.00-HR
+   (CFS)        (HR)
                           (CFS)
+     343.      12.50                      81.          27.          27.          27.
                           (INCHES)      8.150       10.774       10.774       10.774
                           (AC-FT)         40.          53.          53.          53.

 PEAK STORAGE    TIME                                MAXIMUM AVERAGE STORAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+  (AC-FT)       (HR)
       10.      12.50                       4.           2.           2.           2.

  PEAK STAGE     TIME                                 MAXIMUM AVERAGE STAGE
                                          6-HR        24-HR        72-HR       24.00-HR
+   (FEET)       (HR)
      9.89      12.50                     4.75         1.96         1.96         1.96

                         CUMULATIVE AREA =       .09 SQ MI

*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
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188 KK   **************
         *            *
         *     P4c    *
         *            *
         **************
                     RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

192 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                     JXDATE     1    0  STARTING DATE
                     JXTIME          0  STARTING TIME

              SUBBASIN RUNOFF DATA

189 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .05  SUBBASIN AREA

                PRECIPITATION DATA

194 PB               STORM       11.90  BASIN TOTAL PRECIPITATION

195 PI            INCREMENTAL PRECIPITATION PATTERN
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

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190 LS          SCS LOSS RATE
                     STRTL         .15  INITIAL ABSTRACTION
                     CRVNBR      93.00  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

191 UD          SCS DIMENSIONLESS UNITGRAPH
                     TLAG          .35  LAG

                                                  ***

                                        UNIT HYDROGRAPH
                                   23 END-OF-PERIOD ORDINATES
          6.       20.       42.       56.       58.       51.       40.       27.       19.       14.
         10.        7.        5.        3.        2.        2.        1.        1.        1.        0.
          0.        0.        0.

    TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

  PEAK FLOW      TIME                      MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     228.      12.25                42.         14.         14.         14.
                        (INCHES)  8.243      10.987      10.987      10.987
                         (AC-FT)    21.         28.         28.         28.

                     CUMULATIVE AREA =     .05 SQ MI
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***          ***          ***          ***          ***

                HYDROGRAPH AT STATION      P4c
                  FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =   4.88, TOTAL LOSS =   .80, TOTAL EXCESS =   4.08

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    88.      12.25                 16.          5.           5.           5.
                        (INCHES)   3.154        4.057        4.057        4.057
                         (AC-FT)    8.          10.          10.          10.

                       CUMULATIVE AREA =     .05 SQ MI

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

                HYDROGRAPH AT STATION      P4c
                  FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.97, TOTAL LOSS =   .84, TOTAL EXCESS =   7.14

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   150.      12.25                 27.          9.           9.           9.
                        (INCHES)   5.408        7.099        7.099        7.099
                         (AC-FT)   14.          18.          18.          18.

                       CUMULATIVE AREA =     .05 SQ MI

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

                HYDROGRAPH AT STATION      P4c
                  FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.76, TOTAL LOSS =   .85, TOTAL EXCESS =   8.91

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   186.      12.25                 34.         11.          11.          11.
                        (INCHES)   6.629        8.864        8.864        8.864
                         (AC-FT)   17.          22.          22.          22.

                       CUMULATIVE AREA =     .05 SQ MI

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

                HYDROGRAPH AT STATION      P4c
                  FOR PLAN 1, RATIO =  .92

  TOTAL RAINFALL =  10.95, TOTAL LOSS =   .85, TOTAL EXCESS =  10.09

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                  6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
   208.      12.25                 38.         13.          13.          13.
                        (INCHES)   7.559       10.047       10.047       10.047
                         (AC-FT)   19.          25.          25.          25.

                       CUMULATIVE AREA =     .05 SQ MI

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

                HYDROGRAPH AT STATION      P4c
                  FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =  11.90, TOTAL LOSS =   .86, TOTAL EXCESS =  11.04

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
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                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    228.      12.25                    42.          14.          14.          14.
                        (INCHES)      8.243       10.987       10.987       10.987
                         (AC-FT)        21.          28.          28.          28.

                       CUMULATIVE AREA =      .05 SQ MI


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


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            .            .
205 KK      *     COMB   *
            *            *
            ..............

206 HC          HYDROGRAPH COMBINATION
                      ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ***

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

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .41

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    140.      12.25                    46.          15.          15.          15.
                        (INCHES)      2.094        4.000        4.000        4.000
                         (AC-FT)        23.          30.          30.          30.

                       CUMULATIVE AREA =      .14 SQ MI

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

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .87

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    282.      12.58                    80.          26.          26.          26.
                        (INCHES)      5.346        7.005        7.005        7.005
                         (AC-FT)        40.          52.          52.          52.

                       CUMULATIVE AREA =      .14 SQ MI

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

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .82

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)       (HR)
                          (CFS)
     377.      12.57                    99.          33.          33.          33.
                        (INCHES)      6.649        8.749        8.749        8.749
                         (AC-FT)        69.          65.          65.          65.

                       CUMULATIVE AREA =      .14 SQ MI

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

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .42

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
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+   (CFS)        (HR)
                          (CFS)
+    453.       12.42                  112.          37.          37.          37.
                         (INCHES)     7.508        9.813        9.813        9.813
                          (AC-FT)      56.          73.          73.          73.

                         CUMULATIVE AREA =      .14 SQ MI
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***            ***            ***            ***            ***

                    HYDROGRAPH AT STATION     COMB
                      FOR PLAN 1, RATIO = 1.00

 PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    505.       12.42                  122.         40.          40.          40.
                         (INCHES)     8.190       10.846       10.846       10.846
                          (AC-FT)      61.          80.          80.          80.

                         CUMULATIVE AREA =      .14 SQ MI
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*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

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            *          *
207 KK      *    E4    *
            *          *
            ************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

211 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE       1   0  STARTING DATE
                    JXTIME           0  STARTING TIME

              SUBBASIN RUNOFF DATA

208 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .05  SUBBASIN AREA

                PRECIPITATION DATA

213 PB               STORM       13.90  BASIN TOTAL PRECIPITATION

214 PI            INCREMENTAL PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00
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209 LS          SCS LOSS RATE
                     STRTL          .36  INITIAL ABSTRACTION
                    CRVNBR        84.90  CURVE NUMBER
                     RTIMP          .00  PERCENT IMPERVIOUS AREA

210 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG          .11  LAG

                                                                  ***

                                                    UNIT HYDROGRAPH
                                                 9 END-OF-PERIOD ORDINATES
                 92.     162.      84.      34.      14.       6.       2.       1.       0.

    TOTAL RAINFALL =   11.90, TOTAL LOSS =   1.90, TOTAL EXCESS =   10.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR      24-HR      72-HR    24.00-HR
  (CFS)         (HR)
                                   (CFS)
+    370.     12.00                  42.        14.        14.        14.
                                (INCHES)     7.728      9.988      9.988      9.988
                                  (AC-FT)      21.        27.        27.        27.

                                CUMULATIVE AREA =     .05 SQ MI

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

                                HYDROGRAPH AT STATION       E4
                                  FOR PLAN 1, RATIO =  .41

    TOTAL RAINFALL =    4.88, TOTAL LOSS =   1.63, TOTAL EXCESS =    3.25

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR      24-HR      72-HR    24.00-HR
+ (CFS)         (HR)
                                   (CFS)
+    127.     12.00                  14.         4.         4.         4.
                                (INCHES)     2.803      3.241      3.241      3.241
                                  (AC-FT)       7.         9.         9.         9.

                                CUMULATIVE AREA =     .05 SQ MI

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

                                HYDROGRAPH AT STATION       E4
                                  FOR PLAN 1, RATIO =  .67

    TOTAL RAINFALL =    7.97, TOTAL LOSS =   1.80, TOTAL EXCESS =    6.18

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR      24-HR      72-HR    24.00-HR
+ (CFS)         (HR)
                                   (CFS)
+    235.     12.00                  27.         8.         8.         8.
                                (INCHES)     4.851      6.165      6.165      6.165
                                  (AC-FT)      13.        17.        17.        17.

                                CUMULATIVE AREA =     .05 SQ MI

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

                                HYDROGRAPH AT STATION       E4
                                  FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =    9.76, TOTAL LOSS =   1.85, TOTAL EXCESS =    7.91

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR      24-HR      72-HR    24.00-HR
+ (CFS)         (HR)
                                   (CFS)
+    297.     12.00                  34.        11.        11.        11.
                                (INCHES)     6.158      7.894      7.894      7.894
                                  (AC-FT)      17.        22.        22.        22.

                                CUMULATIVE AREA =     .05 SQ MI
```

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

                   HYDROGRAPH AT STATION       E4
                     FOR PLAN 1, RATIO =   .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.88, TOTAL EXCESS =    9.07

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+    (CFS)        (HR)
                           (CFS)
+       338.      12.00                39.          12.          12.          12.
                        (INCHES)     7.031        9.056        9.056        9.056
                         (AC-FT)       19.          25.          25.          25.

                         CUMULATIVE AREA =      .05 SQ MI

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

                   HYDROGRAPH AT STATION       E4
                     FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.90, TOTAL EXCESS =   10.00

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+    (CFS)        (HR)
                           (CFS)
+       370.      12.00                42.          14.          14.          14.
                        (INCHES)     7.728        9.988        9.988        9.988
                         (AC-FT)       21.          27.          27.          27.

                         CUMULATIVE AREA =      .05 SQ MI


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

              **************
              *            *
 224 KK       *     COMB   *
              *            *
              **************

 225 HC           HYDROGRAPH COMBINATION
                        ICOMP           3   NUMBER OF HYDROGRAPHS TO COMBINE

                                                                      ***

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

                   HYDROGRAPH AT STATION      COMB
                     FOR PLAN 1, RATIO =   .41

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+    (CFS)        (HR)
                           (CFS)
+       289.      12.08                69.          22.          22.          22.
                        (INCHES)     2.953        3.782        3.782        3.782
                         (AC-FT)       34.          44.          44.          44.

                         CUMULATIVE AREA =      .22 SQ MI

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

                   HYDROGRAPH AT STATION      COMB
                     FOR PLAN 1, RATIO =   .67

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+    (CFS)        (HR)
                           (CFS)
+       513.      12.00               122.          40.          40.          40.
                        (INCHES)     5.205        6.768        6.768        6.768
                         (AC-FT)       61.          79.          79.          79.
```

```
                    (AC-FT)        38.          48.          48.          48.

                    CUMULATIVE AREA =      .26 SQ MI

  ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION        E2
                      FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.55, TOTAL EXCESS =    6.42

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
*    934.     12.08                140.          45.          45.          45.
                        (INCHES)   5.008        6.400        6.400        6.400
                        (AC-FT)     70.          89.          89.          89.

                    CUMULATIVE AREA =      .26 SQ MI

  ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION        E2
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =    9.74, TOTAL LOSS =    1.59, TOTAL EXCESS =    8.17

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1175.     12.08                177.          57.          57.          57.
                        (INCHES)   6.318        8.140        8.140        8.140
                        (AC-FT)     88.         113.         113.         113.

                    CUMULATIVE AREA =      .26 SQ MI

  ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION        E2
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.94, TOTAL LOSS =    1.61, TOTAL EXCESS =    9.34

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1334.     12.08                202.          65.          65.          65.
                        (INCHES)   7.184        9.306        9.306        9.306
                        (AC-FT)    100.         129.         129.         129.

                    CUMULATIVE AREA =      .26 SQ MI

  ...            ...            ...            ...            ...

                    HYDROGRAPH AT STATION        E2
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.62, TOTAL EXCESS =   10.28

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   1461.     12.08                221.          72.          72.          72.
                        (INCHES)   7.891       10.242       10.242       10.242
                        (AC-FT)    110.         142.         142.         142.

                    CUMULATIVE AREA =      .26 SQ MI

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

			** PEAK STAGES IN FEET **						
			1	STAGE	3.83	6.74	8.57	9.23	9.77
				TIME	12.17	12.25	12.25	12.25	12.17
HYDROGRAPH AT +	E3	.12	1	FLOW	276.	498.	625.	709.	776.
				TIME	12.08	12.08	12.08	12.08	12.08
2 COMBINED AT +	COMB	.29	1	FLOW	499.	846.	1036.	1181.	1308.
				TIME	12.08	12.08	12.08	12.17	12.17
HYDROGRAPH AT +	P1c	.01	1	FLOW	16.	30.	38.	43.	47.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT +	P1d	.01	1	FLOW	29.	53.	67.	76.	83.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	E1	.49	1	FLOW	721.	1336.	1689.	1922.	2109.
				TIME	12.25	12.25	12.25	12.25	12.25
HYDROGRAPH AT +	E2	.36	1	FLOW	514.	934.	1175.	1334.	1461.
				TIME	12.17	12.08	12.08	12.08	12.08
4 COMBINED AT +	COMB	1.08	1	FLOW	1795.	3192.	3986.	4608.	5088.
				TIME	12.17	12.17	12.17	12.17	12.17
HYDROGRAPH AT +	P4a	.09	1	FLOW	74.	130.	162.	183.	200.
				TIME	12.00	12.00	12.00	12.00	12.00
HYDROGRAPH AT +	E4b	.09	1	FLOW	147.	250.	309.	349.	380.
				TIME	12.33	12.33	12.33	12.33	12.33
ROUTED TO +	POND	.09	1	FLOW	74.	188.	261.	308.	343.
				TIME	12.83	12.58	12.50	12.50	12.50
			** PEAK STAGES IN FEET **						
			1	STAGE	6.11	8.69	9.27	9.64	9.89
				TIME	12.83	12.58	12.50	12.50	12.50
HYDROGRAPH AT +	P4c	.05	1	FLOW	88.	150.	186.	209.	228.
				TIME	12.25	12.25	12.25	12.25	12.25
2 COMBINED AT +	COMB	.14	1	FLOW	149.	262.	377.	453.	505.
				TIME	12.25	12.58	12.50	12.42	12.42
HYDROGRAPH AT +	E4	.06	1	FLOW	127.	235.	297.	338.	370.
				TIME	12.00	12.00	12.00	12.00	12.00
2 COMBINED AT +	COMB	[illegible]	1	FLOW	289.	513.	677.	720.	786.
				TIME	12.08	12.00	12.00	12.00	12.00

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

APPENDIX F

HEC-RAS RESULTS FOR EXISTING CONDITION

HEC-RAS Version 3.1.1 May 2003
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: PALACIOS DE GURABO
Project File : CREEK1.prj
Run Date and Time: 7/18/2005 1:41:41 PM

Project in SI units

PLAN DATA

Plan Title: CREEK1-EXISTING-CONDITION
Plan File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.p02

Geometry Title: CREEK1-EXISTING-CONDITION
Geometry File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.g01

Flow Title : CREEK1-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f01

Plan Summary Information:

Number of:	Cross Sections =	20	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 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: Mixed Flow

FLOW DATA

Flow Title: CREEK1-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f01

Flow Data (m3/s)

River	Reach	RS	100Y	50Y	25Y	10Y	2Y
1	1	20	21.97	20.07	17.7	14.1	7.81
1	1	17	41.45	38.05	33.53	26.7	14.74
1	1	16	83.02	75.82	66.8	53.15	29.39
1	1	15	85.37	77.97	68.59	54.65	30.11
1	1	13	145.59	132.4	116.52	92.48	50.52
1	1	8	149.18	136.13	119.8	95.06	51.83
1	1	4	157.52	143.69	126.42	100.29	54.7
1	1	1	160.9	146.77	129.11	102.38	55.77

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1	1	100Y	Critical	Known WS = 53.34
1	1	50Y	Critical	Known WS = 53.22
1	1	25Y	Critical	Known WS = 53.06
1	1	10Y	Critical	Known WS = 52.78
1	1	2Y	Critical	Known WS = 52.14

GEOMETRY DATA

Geometry Title: CREEK1-EXISTING-CONDITION
Geometry File : p:\179-Palacios de Durango\HEC-RAS\CREEK1.g01

CROSS SECTION

RIVER: 1
REACH: 1 RS: 20

INPUT
Description: section20
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	117.41	1.28	117	1.55	116.62	4.53	116	5.93	115.64
6.12	115.59	6.57	114.46	7.17	115.28	7.87	115.04	7.96	115
9.18	114.54	9.22	114.38	9.48	114.28	10.12	114.19	10.21	114.14
10.27	114.14	10.63	114	10.87	113.91	11.73	113.56	13.3	113
14.19	112.89	16.17	112	17.04	111.68	18.8	111	20.51	110.38
20.97	110.08	21.17	110	21.22	109.94	21.69	109.78	23.55	109
23.1	108.35	25.86	108	27.72	107.17	28.1	107	28.42	106.83
30.2	106	31.38	105.4	31.72	105.23	32.15	105	32.58	104.5
32.94	104.63	33.18	104.51	34.13	104	35.75	103.22	36.29	103
36.97	102.8	39.29	102	41.83	101.18	42.36	101	42.63	100.35
42.9	100.81	43	100.78	43.13	100.73	43.34	100.66	43.68	100.55
44.35	100.33	45.38	100	45.64	99.91	46.22	99.71	46.58	99.58
46.98	99.45	48.41	99	48.75	99	49.46	98.7	51.39	98
53.07	97.38	53.96	97	54.94	96.57	56.45	96	58.77	95.22
58.9	95	59.85	94.68	59.41	94.73	61.07	94	61.93	93.62
63.27	93	64.22	92.58	63.46	92	66.22	91.62	67.63	91
68.55	90.53	68.84	90.46	69.54	90.13	69.8	90	70.12	89.84
71.44	89	72.22	89	72.65	89	72.9	89.13	73.22	89.31
74.47	90	74.9	90.25	76.21	91	77.79	91.87	78.02	92
78.83	92.44	79.79	93	80.26	93.27	81.53	94	83.17	94.96
83.24	95	84.4	95.06	84.66	95.8	84.78	95.86	84.87	95.91
84.91	95.93	84.99	95.94	84.98	95.95	84.98	95.96	85.06	96
85.12	96.03	87.01	97	87.21	97.1	88.85	98	90.5	98.73
90.93	99	91.81	99.44	92.16	99.62	92.9	99.93	92.82	100
93.43	100.25	95.24	101	96.42	101.59	97.6	102	99.36	102.85
99.89	103	101.35	103.74	101.92	104	103.41	104.67	104.12	105
104.22	105	104.42	105	105.83	105.27	106.48	105.71	106.83	105.71
107.6	105.35	108.24	105.45	108.92	105.49	109.37	105.54	109.87	105.54
110.27	105.61	112.42	105.83	112.6	105.84	112.74	105.86	112.88	105.89
113.37	105.94	113.43	105.95	115.46	105.95	115.5	105.95	115.55	105.96
116.72	106	117.22	106.02	117.24	106.03	118.09	106.04	118.92	106.1
119.04	106.07	119.84	106.14	119.93	106.14	120.24	106.18	121	106.29
121.27	106.32	122.15	106.37	123.36	106.55	123.8	106.56	124.26	106.52
124.77	106.46	125.48	106.25	125.83	106.32	127.54	106	127.59	105.94
127.6	105.99	128.04	105.82	128.84	105.77	129.68	105.64	130.17	105.51
130.46	105.41	131.58	105.15	131.97	105	134.26	104.28	134.9	104.06
135.21	104.35	135.17	104	135.21	103.98	135.41	103.92	136.96	103.18
138.1	103.62	138.55	103.05	138.55	103	141.97	102.2	141.95	102.08
142.03	102.07	142.56	102.04	142.63	102.08	143.21	102.2	146.01	103
148.45	103.71	149.49	104	150.24	104.19	150.7	104.3	151.56	104.47
152.48	104.53	152.84	104.55	153.04	104.54	155.71	104.42	161.15	104.41
161.21	104.4	161.7	104.38	162.25	104.37	162.78	104.37	163.16	104.38
163.76	104.73	163.9	104.77	164.32	105	166.03	105.85	168.2	105.93
166.32	106	168.54	106.11	168.82	106.81	168.44	107	168.84	107.04
170.03	108	171.06	108.25	172.73	109	173.78	109.59	174.01	109.71
174.32	109.87	174.54	110	176.58	110.49	175.97	110.67	176.1	110.74
176.21	110.78	176.7	111	177.02	111.14	178.97	112	178.19	112.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	41.77	.045	83.17	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
41.77	83.17	64.48	64.486	67.416	.1	.3

CROSS SECTION OUTPUT Profile #100

E.G. Elev (m)	121.21	Element	Left OB	Channel	Right OB
Vel Head (m)	.40	Wt. n-Val.		0.045	
W.S. Elev (m)	120.81	Reach Len. (m)	64.48	64.48	67.42
Crit W.S. (m)	120.32	Flow Area (m2)		7.22	
E.G. Slope (m/m)	0.000722	Area (m2)		7.22	
Q Total (m3/s)	11.97	Flow (m3/s)		11.97	
Top Width (m)	7.47	Top Width (m)		7.47	
Vel Total (m/s)	1.66	Avg. Vel. (m/s)		1.66	
Max Chl Dpth (m)	2.82	Hydr. Depth (m)		0.96	
Conv. Total (m3/s)	134.6	Conv. (m3/s)		134.6	
Length Wtd. (m)	64.48	Wetted Per. (m)		7.51	
Min Ch El (m)	118.00	Shear (N/m2)		156.22	
Alpha	1.00	Stream Power (N/m s)		259.40	
Error Line (m)	0.01	Tot Volume (1000 m3)	26.58	24.02	21.74

C & E Loss (m)	0.04	Cum SA (1000 m2)	14.24	44.41	19.68

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 19

INPUT
Description: section19
Station Elevation Data num= 145

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.08	.25	101.06	.33	101.05	.42	101.05	.67	101.04
1.7	101	2.08	100.99	2.11	100.98	2.13	100.98	2.17	100.97
2.23	100.96	2.37	100.95	8.85	100.24	9.23	100.17	9.65	100.09
10.03	100	10.48	99.3	13.49	99	14.38	98.72	16.14	98.15
16.51	98.07	16.95	98	19.45	97.43	21.69	97	26.16	96.04
26.35	96	26.45	95.98	26.46	95.97	26.48	95.97	26.5	95.96
26.53	95.96	26.56	95.95	26.61	95.95	27.69	95.77	28.05	95.75
28.26	95.72	28.42	95.69	30.67	95.21	33.99	94.56	34.58	94.43
35.79	94.21	35.88	94.2	36.01	94.16	36.11	94.13	36.61	94
38.14	93.64	40.85	93	41.71	92.79	47.15	92	47.85	91.92
49.94	91.68	53.68	91.04	55.37	91.1	56.98	91	57.09	90.99
57.1	90.99	57.11	90.99	57.12	90.99	57.14	90.99	57.15	90.99
57.18	90.98	62.98	90.28	63.41	90.22	63.94	90.15	64.61	90.06
65.04	90	65.6	89.92	66.57	89.77	67.34	89.64	67.94	89.54
68.38	89.45	68.7	89.39	70.53	89	74.47	88.27	75.79	88
80.64	87.1	81.33	87	82.29	86.87	83.72	86.69	87.18	86.3
87.36	86.29	87.6	86.24	88.1	86.17	88.5	86.17	90.33	87
91.65	87.6	92.02	87.776	92.49	88	92.99	88.66	94.75	89
96.34	89.71	96.99	90	97.52	90.24	97.75	90.34	99.19	91
100.68	91.66	101.43	92	102.82	92.42	101.73	93	104.7	93.37
106.03	94	108.05	94.75	108.47	94.83	108.92	94.91	109.31	95
110.34	95.12	112.03	95.69	112.5	95.69	112.83	95.76	113.07	95.81
113.22	95.84	113.34	95.87	114.15	96	116.21	96.27	116.97	96.37
121.35	97	127.69	97.86	128.82	98	128.75	98.12	131.3	98.32
131.49	98.32	132.04	98.39	132.34	98.39	135.2	98.54	135.81	98.59
136.32	98.64	140.13	98.69	141.82	98	145.31	97.65	146.81	97.2
147.45	97	147.63	96.93	147.73	96.88	148.02	96.75	148.98	96.29
149.73	96	150.1	95.74	151.54	95	152.7	94.34	152.93	94.22
153.07	94.25	153.18	94.11	153.37	94	153.47	93.95	153.99	93.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	75.79	.045	92.82	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

75.79	92.82	59.958	60.564	70.963	.1	.3

CROSS SECTION OUTPUT Profile #1001

E.G. Elev (m)	88.19	Element	Left OB	Channel	Right OB
Vel Head (m)	1.11	Wt. n-Val.		0.045	
W.S. Elev (m)	87.08	Reach Len. (m)	59.86	60.56	70.96
Crit W.S. (m)	87.42	Flow Area (m2)		4.70	
E.G. Slope (m/m)	0.[illegible]	Area (m2)		4.70	
Q Total (m3/s)	21.97	Flow (m3/s)		21.97	
Top Width (m)	9.76	Top Width (m)		9.76	
Vel Total (m/s)	4.67	Avg. Vel. (m/s)		4.67	
Max Chl Dpth (m)	0.41	Hydr. Depth (m)		0.48	
Conv. Total (m3/s)	63.1	Conv. (m3/s)		63.1	
Length Wtd. (m)	60.56	Wetted Per. (m)		10.01	
Min Ch El (m)	86.17	Shear (N/m2)		558.13	
Alpha	1.00	Stream Power (N/m s)		2608.51	
Frctn Loss (m)	1.95	Cum Volume (1000 m3)	28.58	83.70	21.74
C & E Loss (m)	0.06	Cum SA (1000 m2)	14.24	45.86	19.68

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS:

INPUT
Description: section19
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	88.82	2.09	88.54	6.05	88	13.09	87.66	21.69	87
22.25	86.95	23.1	86.89	23.34	86.89	31.4	86.34	38.02	86
41.64	85.81	41.82	85.8	42.07	85.8	42.4	85.79	42.81	85.78
43.3	85.76	43.89	85.74	44.6	85.72	45.43	85.68	52.86	85.36
53.94	85.32	55.06	85.27	56.19	85.23	57.31	85.18	58.33	85.13
58.49	85.12	60.04	85.06	60.24	85.06	61.42	85.02	61.43	85.02
62.12	85	62.41	85	63.01	84.99	64.11	84.97	64.14	84.97
65.38	84.95	66.65	84.44	67.68	84.92	68.91	85	69.09	85
70.16	85	70.56	85	71.3	85	71.91	85	72.63	85
74.96	85.86	75.13	85.95	75.22	85.96	75.33	86	75.4	86.02
78.08	87	79.87	87.66	85.82	88	87.33	88.85	83.43	89
84.3	89.34	85.93	90	88.19	90.66	88.81	90.84	89.01	90.9
89.37	91	91.74	91.87	94.64	92	96.27	92.23	100.4	93
102.51	93.35	102.74	93.38	102.93	93.38	103.48	93.47	106.61	93.71
106.97	93.7	108.2	93.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	45.43	.045	74.96	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.43	74.96	83.008	83.075	83.193	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	85.78	Element	Left OB	Channel	Right OB
Vel Head (m)	0.21	Wt. n-Val.		0.045	
W.S. Elev (m)	85.57	Reach Len. (m)	83.01	83.08	83.19
Crit W.S. (m)	85.57	Flow Area (m2)		10.80	
E.G. Slope (m/m)	0.027325	Area (m2)		10.80	
Q Total (m3/s)	21.97	Flow (m3/s)		21.97	
Top Width (m)	26.11	Top Width (m)		26.11	
Vel Total (m/s)	2.03	Avg. Vel. (m/s)		2.03	
Max Chl Dpth (m)	0.45	Hydr. Depth (m)		0.41	
Conv. Total (m3/s)	132.9	Conv. (m3/s)		132.9	
Length Wtd. (m)	83.08	Wetted Per. (m)		26.23	
Min Ch El (m)	84.92	Shear (N/m2)		110.88	
Alpha	1.00	Stream Power (N/m s)		224.48	
Frctn Loss (m)	0.10	Cum Volume (1000 m3)	29.59	83.23	21.94
C & E Loss (m)	0.02	Cum SA (1000 m2)	14.24	42.77	29.68

Warning: The energy equation could not be balanced within the specified number of iterations. The program uses critical depth for the water surface and continued on with the calculations.
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: 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.

CROSS SECTION

RIVER: 1
RANCH: 1 RS: 17

INPUT
Description: section17
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.2	82.23	.79	87	4.43	83.3	5.07	81	6.4	80.26
7.12	80.52	8.1	80.27	9.38	80	10.51	79.77	11.47	79.51
12.43	79.28	13.02	[illegible]	15.73	78.59	17.35	78.3	18.4	[illegible]
21.84	77.02	22.01	77.01	23.08	77	23.13	76.98	27.78	[illegible]
31.07	75.12	32.32	75	33.83	74.78	34.69	74.59	38.38	74.47
38.4	74.44	39.7	74.39	39.8	74.37	40.64	74.03	40.75	74.06
41.34	73	43.1	73.11	43.61	75.32	44.05	75.79	44.34	76
44.43	76.46	47.3	77	48.47	77.04	48.57	77.07	49.72	77.4
50.1	77.3	51.12	77.7	51.94	77.84	52.91	78	53.19	78.13
53.35	78.29	54.83	78.51	55.15	78.34	55.27	78.37	55.28	78
55.35	79.22	55.6	79.4	55.54	79.15	55.7	80	57.43	80.79
59.18	81	59.03	81.15	61.08	82	62.19	82.4	62.39	[illegible]
64.25	83.68	64.33	84	66.25	84.62	66.51	84.91	66.71	85
67.54	85.44	68.26	85.5	68.4	85.9	68.45	85.92	68.59	86
68.39	86.13	70.47	87	70.12	87.3	70.32	88	72.42	88.06
73.2	89	75.82	89.75	76.15	90	77.4	90.56	77.98	90.7
77.55	90.79	77.66	91.04	78.32	91	78.68	91.94	78.79	92
79.37	92.1	81.54	[illegible]	81.91	93.10	83.73	93.56	83.84	[illegible]
84.06	94	85.7	94	87.43	94	88.81	94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

.2	.055	27.78	.045	43.81	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
27.78	43.81	83.254	82.13	81.9	.1	.3

CROSS SECTION OUTPUT Profile #100T

			Left OB	Channel	Right OB
E.G. Elev (m)	76.06	Element			
Vel Head (m)	1.02	Wt. n-Val.		0.045	
W.S. Elev (m)	75.04	Reach Len. (m)	83.25	82.13	81.90
Crit W.S. (m)	75.30	Flow Area (m2)		5.60	
E.G. Slope (m/m)	0.274874	Area (m2)		5.60	
Q Total (m3/s)	41.65	Flow (m3/s)		41.65	
Top Width (m)	10.81	Top Width (m)		10.81	
Vel Total (m/s)	7.44	Avg. Vel. (m/s)		7.44	
Max Chl Dpth (m)	0.81	Hydr. Depth (m)		0.52	
Conv. Total (m3/s)	79.4	Conv. (m3/s)		79.4	
Length Wtd. (m)	82.13	Wetted Per. (m)		10.98	
Min Ch El (m)	74.44	Shear (N/m2)		1374.55	
Alpha	1.00	Stream Power (N/m s)		10221.76	
Frctn Loss (m)	7.46	Cum Volume (1000 m3)	29.59	62.55	21.74
C & E Loss (m)	0.26	Cum SA (1000 m2)	14.24	41.24	19.68

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 16

INPUT
Description: sections
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78.93	.07	78.93	1.37	78.95	2.6	78.93	2.85	78.93
3.83	78.88	4.23	78.84	8.96	78.75	8.63	78	11.79	77.34
13.15	77	13.95	76.48	18.15	76	19.18	75.73	19.45	75.73
19.91	75.64	20.79	75.45	22.82	75.03	22.87	75.02	22.95	75
24.7	74.04	27.74	74	30.47	73.7	36.33	73.71	38.12	74
42.42	74.85	43.2	74.98	43.34	75	46.69	75.87	46.95	75.93
47.03	75.96	47.2	76	47.68	76.12	50.17	76.8	51	77
51.96	77.3	52.51	77.49	52.86	77.55	53.63	77.64	53.33	77.7
54.34	77.75	56.62	77.79	58.08	78	58.31	79	59.29	78.23
60.33	78.44	62.37	79	63.91	79	65.28	79.74	66.05	80
66.47	80.12	69.1	81	69.12	81	69.15	81	71.76	81.49
74.14	82	76.4	82.51						

Manning's n Values num= 2

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	22.82	.045	42.42	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.82	42.42	148.1	91.89	39.944	.1	.3

CROSS SECTION OUTPUT Profile #100T

			Left OB	Channel	Right OB
E.G. Elev (m)	75.47	Element			
Vel Head (m)	1.12	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	75.34	Reach Len. (m)	148.10	91.89	39.91
Crit W.S. (m)	75.34	Flow Area (m2)	0.23	24.31	0.60
E.G. Slope (m/m)	0.117675	Area (m2)	0.23	24.31	0.60
Q Total (m3/s)	83.02	Flow (m3/s)	0.16	82.26	0.60
Top Width (m)	23.13	Top Width (m)	1.53	19.60	2.23
Vel Total (m/s)	2.30	Avg. Vel. (m/s)	0.69	3.38	1.00
Max Chl Dpth (m)	1.04	Hydr. Depth (m)	0.15	1.24	0.27
Conv. Total (m3/s)	128.5	Conv. (m3/s)	1.2	4618.7	4.5
Length Wtd. (m)	91.89	Wetted Per. (m)	1.53	19.83	2.29
Min Ch El (m)	73.79	Shear (N/m2)	36.35	232.47	45.82
Alpha	1.34	Stream Power (N/m s)	16.18	719.00	45.61
Frctn Loss (m)	3.62	Cum Volume (1000 m3)	24.57	61.32	21.72
C & E Loss (m)	0.13	Cum SA (1000 m2)	14.17	39.99	19.59

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 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: 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 controlling upper. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section15
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.01	.08	100	1.44	99.84	2.47	99.74	3.06	99.68
3.56	99.6	4.2	99.51	5.2	99.28	5.67	99.2	5.88	99.16
6.48	99	6.99	98.7	8.41	98	9.88	97.29	10.33	97
11.71	96.31	12.2	96	13.33	95.37	13.65	95.23	14.19	95
14.84	94.77	14.94	94.69	15.15	94.54	15.32	94.47	16.19	94
16.76	93.66	18.21	93	19.12	92.59	20.4	92	22.22	91.1
22.45	91	24.17	90.34	24.49	90.45	24.98	90.24	25.62	90
27.06	89.45	27.36	89.26	27.74	89.18	28.17	89	28.33	88.97
30.71	88	30.91	87.91	33.3	87	34.23	86.69	35.25	86.41
36.81	86	37.48	85.69	39.5	85	40.05	84.81	42.39	84
43.1	83.76	45.2	83	46.06	82.87	49.38	82	51.38	81.49
53.23	81	55.63	80.06	55.76	80	56.08	79.86	57.65	79
58.32	78.63	59.69	78	61.23	77.14	61.46	77	63.38	76.41
63.77	76.18	63.97	76.14	64.14	76	64.47	75.86	64.67	75.79
65.1	75.54	66.69	75	67	74.85	68.72	74	69.84	73.15
70.58	73	72.39	72.26	72.9	72	73.43	71.56	74.7	71
75.65	70.72	76.11	70.57	77.61	70.07	77.83	70	78.2	70
78.63	70	78.91	70	84.82	69.57	85.7	69.53	87.51	69.49
87.76	69.44	88.27	69.42	94.5	69.6	94.8	69.59	95.23	69.63
95.53	69.64	95.91	69.67	96.59	69.69	97.2	69.72	97.51	69.74
98.19	69.76	101.67	69.96	101.72	69.96	101.8	69.96	102.19	70
103.39	70	104.8	70	106.05	70	108.4	70	108.57	70
108.92	70	108.99	70	109.5	69.9	109.52	68.833	112.24	68
115.1	68.26	115.56	68.14	116.07	68	116.37	67.94	116.45	67.93
116.72	67.89	117.13	67.83	118.23	67.4	122.47	67	124.14	67
128.69	67	130.17	67	131.52	67	131.94	67	132.46	67
132.97	67	134.18	67	134.45	67	135.94	67	137.18	67
138.2	67	138.74	67	139.33	67	140.59	67	142.71	67.5
145.05	68	146.94	68.48	148.27	69	149.69	69.65	150.19	69.88
150.49	70	151.36	70.2	152.31	70.53	153.01	71	153.14	71.26
154.76	72	155.43	72.12	156.44	73	156.86	73.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	109.52	.045	149.69	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
109.52 149.69 131.758 98.443 81.837 .1 .3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	71.[illegible]	Element	Left OB	Channel	Right OB
Vel Head (m)	1.[illegible]	Wt. n-Val.		0.045	
W.S. Elev (m)	[illegible]	Reach Len. (m)	[illegible]	[illegible]	[illegible]
Crit W.S. (m)	[illegible]	Flow Area (m2)		[illegible]	
E.G. Slope (m/m)	[illegible]	Area (m2)		[illegible]	
Q Total (m3/s)	[illegible]	Flow (m3/s)		[illegible]	
Top Width (m)	[illegible]	Top Width (m)		[illegible]	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		[illegible]	
Max Chl Dpth (m)	[illegible]	Hydr. Depth (m)		[illegible]	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		[illegible]	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		[illegible]	
Min Ch El (m)	[illegible]	Shear (N/m2)		[illegible]	
Alpha	[illegible]	Stream Power (N/m s)		[illegible]	
Erth Loss (m)	[illegible]	Cum Volume (1000 m3)	[illegible]	[illegible]	[illegible]
C & E Loss (m)	[illegible]	Cum EA (1000 m2)	[illegible]	[illegible]	[illegible]

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 1.3. 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section14
Station Elevation Data num= [illegible]

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
[illegible]	96.5	[illegible]	[illegible]	[illegible]	96.33	[illegible]	96.21	[illegible]	[illegible]

4.44	96.86	4.59	96.87	5.47	96.91	5.95	96.9	8.73	96
9.21	95.84	9.29	95.81	9.19	95.78	9.55	95.72	9.86	95.62
10.82	95.3	11.7	95	12.13	94.91	12.38	94.74	16.35	94.68
17.42	94.81	17.68	94.8	18.53	94.83	18.64	94.9	19.02	95
19.98	95	20.61	95	21.68	94.34	22.4	93.91	23.87	93
24.09	92.93	25.59	92.41	26.39	92	28.27	91.52	29.8	91
31	90.61	32.79	90	34.17	90	34.37	90	34.56	90
34.84	90	35.33	90	35.64	90	36.76	89.68	37.49	89.46
38.52	89	39.33	88.82	40.92	88.12	41	88.09	41.17	88
41.74	87.65	42.55	87.12	42.7	87	43.08	86.93	43.13	86.92
43.22	86.91	43.42	86.88	43.95	86.8	47.08	86.28	49.39	86
49.24	85.9	49.37	85.87	50.2	85.79	52.3	85	52.38	84.97
52.72	84.82	54.52	84	55.45	83.55	56.71	83	57.62	82.59
58.92	82	59.63	81.53	60.47	81	62.19	80.05	62.29	80
62.41	79.33	64	79	64.52	78.5	65.78	78	66.97	77.37
67.63	77	68.74	76.45	69.57	76	71.03	75.2	71.39	75
71.76	74.81	73.31	74	74.1	73.54	75.07	73	76.06	72.44
78.83	72	77.73	71.49	78.63	71	80.16	70.13	80.39	70
80.52	69.93	80.83	69.73	82.16	69	83.34	68.34	83.94	68
85.32	67.23	85.71	67	87.02	66.26	87.53	66	88.68	66
89.38	66	92.69	66	94.32	66	94.46	65.98	94.69	66
100.26	66.78	101.41	67	107.25	67.8	107.5	67.82	108.55	68
108.86	68	111.87	68	116.39	68	129.63	68.83	129.88	68.86
130.88	68.96	131.38	69	134.4	69.33	136.38	69.55	138.92	69.83
139.45	69.89	139.94	69.94	140.08	69.94	140.42	70	141.67	70.32
143.02	70.86	143.89	70.77	144.35	71	145.46	71.36	147.24	72
148.62	72.52	149.84	73	150.17	73.1	152.73	74	153.48	74.21
153.63	74.25	153.97	74.43	154.5	74.49	155.32	74.74	156.17	75
157.05	75.24	159.87	74	160.83	76.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	83.34	.045	107.25	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
83.34	107.25	87.1	91.634	97.207	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	88.10	Element	Left OB	Channel	Right OB
Vel Head (m)	0.58	Wt. n-Val.		0.045	
W.S. Elev (m)	87.53	Reach Len. (m)	87.10	91.63	97.21
Crit W.S. (m)	87.73	Flow Area (m2)		25.40	
E.G. Slope (m/m)	0.019978	Area (m2)		25.40	
Q Total (m3/s)	85.37	Flow (m3/s)		85.37	
Top Width (m)	22.28	Top Width (m)		22.28	
Vel Total (m/s)	3.36	Avg. Vel. (m/s)		3.36	
Max Chl Dpth (m)	1.75	Hydr. Depth (m)		1.14	
Conv. Total (m3/s)	605.5	Conv. (m3/s)		605.5	
Length Wtd. (m)	91.23	Wetted Per. (m)		22.85	
Min Ch El (m)	85.98	Shear (N/m2)		216.60	
Alpha	1.00	Stream Power (N/m s)		728.07	
Frctn Loss (m)	1.29	Cum Volume (1000 m3)	29.55	58.02	21.71
C & E Loss (m)	0.19	Cum WA (1000 m2)	14.06	35.80	19.55

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 2.3

INPUT
Description: section\1:
Station Elevation Data num= 162

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.94	1.18	87.35	1.97	87	2.6	86.65	3.78	86
5.28	85.22	5.62	85.24	5.69	85	5.75	84.96	6.07	84.77
7.44	83	8.15	83.21	8.28	83	9.94	82.6	10.96	82
11.62	81.6	12.68	81	13.75	80.23	13.89	80.13	14.09	80
14.13	79.87	14.31	79	17.05	78.36	17.63	78	18.82	77.27
19.26	77	20.73	76.72	20.78	76	20.85	75.95	20.87	75.94
20.42	75.81	21.02	75.63	22.48	75	22.69	74.87	24.31	74
24.41	73.85	24.82	73.73	25.55	73.53	25.93	73.41	26.21	73.36
26.8	73.2	27.02	[illegible]	28.49	73.19	28.47	73.06	29.68	73.04
29.85	73	31.21	72.28	33.93	72	34.82	71.8	35.48	71.64
36.93	71.27	37.93	[illegible]	38.06	70.97	38.13	70.95	38.27	70.91
38.63	70.53	40.43	[illegible]	41.22	70	41.38	69.78	42.46	69.53
43.21	69.47	44.[illegible]	[illegible]	48.52	68.53	48.09	68	50.78	67.22

51.52	67	51.92	[illegible]	52.47	66.74	52.42	66.62	53.82	66.34
55.04	66	56.01	[illegible]	56.31	65.63	56.91	65.46	58.5	65.01
58.54	65	58.55	65	58.3	64.8	62.42	64	65.91	63.1
66.32	63	66.56	63	66.74	63	67.17	63	67.96	63.1
72.25	64	76.78	[illegible]	77.18	65	79.14	65	79.58	65
80.22	64.89	80.86	[illegible]	84.89	64	89.85	63.12	90.52	63
92.42	62.4	94.11	62.42	94.29	62.43	96.58	62.99	96.61	63
96.62	63	98.4	63.24	98.84	63.28	99.52	63.25	100.92	63.5
103	63.75	104.88	64	105.44	64	105.46	64	105.75	64
106.11	64.07	106.2	64.08	107.91	64.23	108.14	64.39	108.65	64.48
109.53	64.64	110.09	64.73	110.9	64.87	111	64.89	111.64	65
112.07	65.08	112.2	65.13	113.2	65.34	112.78	65.47	116.17	66
116.5	66.08	119.74	67	120.17	67.13	122.62	68	124.5	68.63
125.89	69	129.99	69	130.42	69.5	130.54	69.53	130.94	69.5
131.27	69.52	131.68	69.52	132.18	69.51	132.56	69.5	133.53	69.51
133.94	69.49	134.11	69.48	134.81	69.46	136.8	69.41	137.21	69.38
137.55	69.38	137.97	69.39	138.19	69.39	138.46	69.41	138.97	69.47
139.45	69.52	140.25	69.62	141.64	69.8	143.26	70	143.76	70.06
144.99	70.21	145.67	70.31	146.11	70.35	146.67	70.43	147.64	70.55
148.13	70.61	148.9	70.7						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	79.14	.045	110.09	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
79.14	110.09	73.04	141.422	191.556	.1	.3

CROSS SECTION OUTPUT Profile #1000

E.G. Elev (m)	85.18	Element	Left OB	Channel	Right OB
Vel Head (m)	1.13	Wt. n-Val.	0.055	0.045	
W.S. Elev (m)	83.93	Reach Len. (m)	73.04	141.42	191.56
Crit W.S. (m)	84.29	Flow Area (m2)	4.77	14.10	
E.G. Slope (m/m)	0.000652	Area (m2)	4.77	14.10	
Q Total (m3/s)	85.27	Flow (m3/s)	15.23	70.16	
Top Width (m)	28.43	Top Width (m)	9.23	19.10	
Vel Total (m/s)	3.52	Avg. Vel. (m/s)	3.19	4.98	
Max Chl Dpth (m)	5.33	Hydr. Depth (m)	0.52	0.74	
Conv. Total (m3/s)	489.1	Conv. (m3/s)	55.0	253.3	
Length Wtd. (m)	127.13	Wetted Per. (m)	9.44	19.40	
Min Ch El (m)	82.40	Shear (N/m2)	379.84	348.45	
Alpha	1.4	Stream Power (N/m s)	1212.34	2719.61	
Exctn Loss (m)	3.18	Tum Volume (1000 m3)	29.34	56.21	1.2
C & E Loss (m)	3.06	Tum SA (1000 m2)	13.86	13.30	14.53

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 12

INPUT
Description: section12
Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.23	.07	[illegible]	.52	87	2.37	86.2	2.57	86.1
2.61	86.02	2.85	[illegible]	2.91	85.97	2.92	85.97	2.94	85.96
2.97	85.95	3.02	[illegible]	3.14	85.9	5.91	85	7.8	84.[illegible]
8.14	84.28	8.37	[illegible]	8.46	84.17	8.54	84.15	9.6	84.1[illegible]
8.99	84	9.24	[illegible]	12.06	83	12.14	82.87	12.38	82.8[illegible]
14.86	82	17.64	[illegible]	17.76	81	18.04	80.9	18.1	80.8[illegible]
18.18	80.86	18.2[illegible]	[illegible]	18.44	80.76	18.9	80.62	20.42	80.11
20.75	80	20.8[illegible]	[illegible]	21.[illegible]	79.86	23.58	79	25.4	78.[illegible]
26.75	78	27.96	[illegible]	30.11	77	31.5	76.46	33.14	76
34.89	75.45	35.1[illegible]	[illegible]	36.82	75	37.8	74.26	38.14	74.1[illegible]
38.51	74	39.7[illegible]	[illegible]	41.13	73	41.58	72.81	41.56	72
45.9	71	45.91	71	45.92	70.99	45.93	70.99	45.97	70.98
48.32	70	50.2[illegible]	[illegible]	50.66	69.05	50.7	69.04	50.72	69.0[illegible]
50.73	69.02	50.74	[illegible]	50.75	69.01	50.78	69	50.79	68.99
52.91	68	53.17	[illegible]	55.03	67	55.61	66.68	57.07	66
58.38	65.35	58.97	[illegible]	59.12	65	59.26	64.93	59.62	64.75
61.18	64	61.34	[illegible]	63.23	63	64.12	62.29	64.74	[illegible]
65.65	61.43	65.6[illegible]	[illegible]	66.22	60.09	66.91	60	67.03	59.99
68.2	59	68.45	[illegible]	68.48	58.01	68.49	58.01	68.52	58.03
70.75	60	70.81	[illegible]	71.6	60.36	72.07	60.55	72.23	60.68
73.17	61	74.51	[illegible]	75.54	62	76.33	62.32	77.36	62.34
78.57	62.72	79.2[illegible]	[illegible]	79.42	63	81.67	63.12	82.69	63.1[illegible]
84.31	63.24	84.53	[illegible]	85.12	63.29	85.72	63.32	86.5	63.36
87.71	63.45	88.1	[illegible]	93.75	63.98	94.23	64	94.25	64

96.26	64.42	98.58	65	98.72	65.04	99.65	65.29	100.17	65.42
100.47	65.56	100.86	65.61	101.03	65.65	101.22	65.7	102.41	66
105.42	66.88	106.41	67	107.21	67.2	109.92	67.82	110.75	68
111.53	68.11	114.77	68.52	116.72	69	121.12	69.21	121.68	69.25
122.73	69.34	125.11	69.53	130.86	70	133.56	70.2	138.96	70.6
140.64	70.73	143.57	71	145.38	71.14	148.84	71.41	150.31	71.5
150.78	71.54	151.97	71.63						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.13	.045	76.57	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
63.13	78.57	46.519	83.206	120.746	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.41	Element	Left OB	Channel	Right OB
Vel Head (m)	0.11	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.30	Reach Len. (m)	46.52	83.21	120.75
Crit W.S. (m)	62.38	Flow Area (m2)	1.73	50.18	14.31
E.G. Slope (m/m)	0.001168	Area (m2)	1.73	50.18	14.31
Q Total (m3/s)	85.37	Flow (m3/s)	0.76	76.74	7.87
Top Width (m)	35.12	Top Width (m)	2.57	15.44	17.11
Vel Total (m/s)	1.29	Avg. Vel. (m/s)	0.44	1.53	0.55
Max Chl Dpth (m)	5.30	Hydr. Depth (m)	0.67	3.25	0.84
Conv. Total (m3/s)	2497.9	Conv. (m3/s)	22.4	2245.3	230.2
Length Wtd. (m)	68.89	Wetted Per. (m)	2.88	17.56	17.21
Min Ch El (m)	59.00	Shear (N/m2)	6.87	32.73	9.53
Alpha	1.28	Stream Power (N/m s)	3.04	50.05	5.24
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	29.10	51.99	20.34
C & E Loss (m)	0.03	Cum SA (1000 m2)	13.23	31.63	17.91

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 11

INPUT
Description: section11
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.25	.59	74	1.34	73.66	2.9	73	3.51	72.73
5.27	72	5.83	71.76	7.22	71.23	8.04	71	8.62	70.8
8.97	70.68	10.37	70.23	11.12	70	13.68	69.12	13.87	69.06
13.93	69.04	14.05	69	14.21	68.98	17.27	68	19.66	67.06
19.76	67	20.87	66.65	22.03	66	23.56	65.7	23.92	65.58
24.48	65.33	25.64	65	25.95	64.89	28.42	64	31.24	63.09
31.45	63	32.51	62.58	32.8	62.48	34.17	62	37.51	61.22
38.1	61	41.46	60.16	42.07	60	44.22	59.89	47.07	59.74
48.37	59.64	57.94	59	60.34	59	68.61	58.65	73.73	58.46
84.18	58	85.19	58	85.28	58	85.3	58	87.91	57.29
88.42	57	89	57	89.29	57	89.84	57	90.95	57.734
91.17	57.88	91.35	58	92.38	58.81	92.86	59	93.55	59.47
94.94	60	95.03	60.51	95.77	61	95.95	61.13	97.14	62
97.44	62.23	98.49	63	99.17	63.45	99.92	64	101.23	64.93
101.34	65	102.62	65.16	105.5	65.57	108.34	66	108.79	66.08
109.62	66.12	130.6	67.47	130.98	67.48	134.65	67.29	134.94	67.3
137.1	67.44	138	67.51	138.24	67.47	138.4	67.49	138.68	67.47
138.98	67.46	139.37	67.46	139.62	67.47	141.65	67.52	142.33	67.5
146.08	67.32	146.47	67.61						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	84.18	.045	90.95	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
84.18	90.95	64.20	63.21	72.56	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.47	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.46	Reach Len. (m)	64.20	63.21	72.56
Crit W.S. (m)		Flow Area (m2)	262.65	46.45	31.88
E.G. Slope (m/m)	0.000[illegible]	Area (m2)	262.65	46.45	31.88
Q Total (m3/s)	145.39	Flow (m3/s)	106.65	29.20	9.24
Top Width (m)	72.88	Top Width (m)	56.75	6.77	9.47
Vel Total (m/s)	0.48	Avg. Vel. (m/s)	0.41	0.63	0.29
Max Chl Dpth (m)	7.[illegible]	Hydr. Depth (m)	4.63	6.86	3.37
Conv. Total (m3/s)	17[illegible]	Conv. (m3/s)	13155.0	3601.2	1139.7
Length Wtd. (m)	[illegible]	Wetted Per. (m)	57.65	7.13	11.56
Min Ch El (m)	[illegible]	Shear (N/m2)	1.85	4.20	1.78

Alpha	1.14	Stream Power (N/m s)	1.20	2.64	0.52
Froth Loss (m)	0.02	Cum Volume (1000 m3)	22.85	41.27	17.55
C & E Loss (m)	0.00	Cum DA (1000 m2)	11.85	30.71	16.31

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.38	1.25	73.35	4.06	73.36	4.16	73.35
4.68	73.4	5.13	73.45	5.66	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	9.45	73.03	9.75	73.01	9.78	73
10.27	72.73	10.99	72.58	11.03	72.26	12.36	72.21	13.10	72.09
13.64	72	13.89	71.89	18.69	71.24	19.63	71.09	20.02	71.04
20.08	71.03	20.09	71.02	20.11	71.02	20.37	71	21.69	70.78
21.88	70.78	22.96	70.74	22.98	70.67	22.79	70.7	23.04	70.59
23.84	70.53	24.12	70.51	26.65	70	26.95	70	28.89	69.32
29.92	69	32.1	68.21	32.48	68.07	32.6	68.02	32.66	68
32.86	67.95	32.95	67.92	35.91	67	37.34	66.42	38	66
39.23	65.48	40.34	65	41.68	64.59	43.25	64	43.83	63.70
44.06	63.71	44.38	63.69	44.88	63.55	45.47	63.41	45.9	63.34
46.72	63.17	47.84	63	49.17	62.73	50.35	62.45	50.92	62.22
52.58	62	53.89	61.8	54.58	61.74	54.75	61.7	55.09	61.66
57.47	61.57	59.14	61.56	61.7	61.3	62.94	61.19	63.69	61.14
63.82	61.14	64.3	61.19	64.26	61.19	64.74	61.21	69.27	62
69.78	62.09	69.88	62.1	69.98	62.1	70.94	62.22	71.14	62.25
71.81	62.29	72.43	62.38	72.94	62.45	73.38	62.44	73.74	62.47
74.11	62.46	79.26	62	82.79	61.68	83.18	61.63	83.69	61.55
85.07	61.27	86.33	61	88.74	60.39	89.2	60.12	89.75	60
89.51	59.6	89.76	59	89.83	58.51	90.05	58	90.08	57.7
90.35	57.26	90.46	57.12	90.83	57	91.26	56.92	91.79	56.35
92.02	57	92.3	57.0	93.13	58	93.15	56.94	93.[illegible]	58
93.51	57.76	93.73	57.72	93.91	57.84	93.99	57.87	94.07	57.89
94.24	57.93	94.55	58	96.82	58.75	97.56	59	100.16	59.35
100.58	60	100.8	60.08	101.72	60.38	102.29	60.55	102.8	60.68
103.15	60.71	103.46	60.74	105.53	61	105.96	61.05	106.01	61.16
106.06	61.07	106.13	61.07	110.22	61.11	110.94	61.12	114.24	61.21
114.5	61.23	115.08	61.27	115.34	61.34	115.94	61.47	116.24	61.57
117.29	62	117.8	62.21	120.92	62.99	120.97	63	120.95	63
121.88	63.08	121.94	63.07	122.5	63.13	122.59	63.12	122.69	63.12
122.81	63.11	123.18	63.19	123.7	63.23	124	63.26	124.47	63.31
125.06	63.41	127.6	63.77	129.11	64	130.48	64.12	130.98	64.14
142.68	64.77	143.47	64.84	144.16	64.88	144.2	64.88	144.66	64.89
144.74	64.89	144.88	64.89	145.11	64.88	145.39	64.88	146.11	64.89
148.84	65	149.88	65	150.43	65	151.27	65	152	65
152.54	65	153.56	65	153.84	65	155.18	65	155.19	65
155.2	65	155.77	65	156.31	65	156.65	65	157.61	65
157.74	65	157.98	65	158.91	65	159.78	65	159.[illegible]	65
159.14	65	159.81	65	160.25	65	161.28	65	161.59	65
162.04	65	162.1	65	162.66	65	163.01	65	163.32	65
163.78	65	164.19	65	164.86	65	191.38	65.97	191.45	65.7
192.5	66	192.61	66	192.84	66	192.94	66	193.[illegible]	66
193.10	66	190.87	66.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
88.74	100.8	[illegible]	39.111	28.312	.1	.3

CROSS SECTION OUTPUT Profile #100

			Left OB	Channel	Right OB
E.G. Elev (m)	74.0	Element			
Vel Head (m)	0.22	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	74.0	Reach Len. (m)	50.27	39.11	28.31
Crit W.S. (m)	71.[illegible]	Flow Area (m2)	108.60	[illegible]	68.34
E.G. Slope (m/m)	0.000[illegible]	Area (m2)	108.60	[illegible]	68.34
Q Total (m3/s)	145.00	Flow (m3/s)	51.25	64.10	29.66
Top Width (m)	92.12	Top Width (m)	48.38	12.00	31.94
Vel Total (m/s)	0.59	Avg. Vel. (m/s)	0.47	1.65	0.43
Max Chl Dpth (m)	7.41	Hyd. Depth (m)	2.34	5.22	2.34
Conv. Total (m3/s)	9771.2	Conv. (m3/s)	3451.8	4222.1	1497.3
Length Wtd. (m)	39.11	Wetted Per. (m)	46.99	12.[illegible]	34.15
Min Ch El (m)	67.62	Shear (N/m2)	5.00	5.37	1.38
Alpha	1.12	Stream Power (N/m s)	2.36	1.12	1.88
Froth Loss (m)		Cum Volume (1000 m3)	11.04	44.23	11.83
C & E Loss (m)		Cum DA (1000 m2)	8.54	30.11	14.74

CULVERT

RIVER: 1
REACH: 1 RS: 9.5

INPUT
Description:
Distance from Upstream XS = 5
Deck/Roadway Width = 15.191
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
42.1	64.2		142.68	64.2	

Upstream Bridge Cross Section Data
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.38	1.25	73.35	4.06	73.36	4.36	73.36
4.68	73.4	5.13	73.45	5.66	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	9.69	73.03	9.75	73.01	9.78	73
10.27	72.73	10.99	72.58	11.85	72.26	12.36	72.21	13.18	72.09
13.64	72	13.88	71.89	18.66	71.24	19.63	71.09	20.02	71.04
20.06	71.03	20.09	71.02	20.11	71.02	20.37	71	21.69	70.78
21.88	70.78	22.04	70.79	22.58	70.67	22.79	70.7	23.04	70.69
23.84	70.53	24.32	70.51	26.63	70	26.95	70	28.89	69.35
29.92	69	32.1	68.21	32.48	68.07	32.6	68.02	32.66	68
32.86	67.95	32.95	67.92	35.91	67	37.34	66.42	38	66
39.23	65.48	40.34	65	41.68	64.39	43.25	64	43.83	63.78
44.06	63.71	44.38	63.63	44.86	63.55	45.47	63.41	45.9	63.34
46.72	63.17	47.04	63	49.17	62.73	50.35	62.45	50.92	62.32
52.56	62	53.89	61.9	54.56	61.74	54.75	61.7	55.09	61.66
57.87	61.57	59.14	61.56	61.7	61.3	62.94	61.19	63.69	61.14
63.82	61.14	64.4	61.19	64.56	61.19	64.74	61.21	69.27	62
69.78	62.09	69.89	62.1	69.98	62.1	70.94	62.22	71.14	62.23
71.81	62.29	72.43	62.38	72.94	62.45	73.36	62.44	73.74	62.47
74.11	62.46	79.26	62	82.73	61.68	83.18	61.63	83.69	61.55
85.07	61.27	86.33	61	88.74	60.39	89.2	60.13	89.35	60
89.51	59.6	89.78	59	89.83	58.51	90.05	58	90.09	57.7
90.35	57.26	90.46	57.12	90.63	57	91.26	56.92	91.79	56.95
92.02	57	92.5	57.8	93.03	58	93.15	58.04	93.2	58
93.01	57.74	93.73	57.72	93.91	57.84	93.99	57.87	94.07	57.89
94.24	57.93	94.55	58	94.82	58.15	97.56	59	100.16	59.85
100.68	60	100.8	60.04	101.72	60.38	102.29	60.55	102.8	60.64
103.15	60.71	103.36	60.74	105.53	61	105.96	61.05	106.01	61.06
106.06	61.07	106.13	61.07	110.22	61.11	110.94	61.12	114.29	61.21
114.5	61.23	115.08	61.27	115.34	61.34	115.94	61.47	116.26	61.57
117.28	62	117.8	62.21	120.42	62.99	120.93	63	120.95	63
121.88	63.08	121.94	63.07	122.5	63.13	122.59	63.12	122.69	63.12
122.81	63.13	123.18	63.19	123.7	63.23	124	63.26	124.43	63.31
125.06	63.41	127.6	63.77	129.11	64	130.48	64.12	130.85	64.14
142.68	64.77	143.47	64.84	144.16	64.88	144.2	64.88	144.66	64.89
144.74	64.89	144.84	64.89	145.31	64.88	145.39	64.88	146.12	64.83
148.84	65	149.88	65	150.49	65	151.27	65	152	65
152.94	65	153.16	65	153.84	65	155.18	65	155.19	65
155.2	65	155.77	65	156.31	65	156.85	65	157.51	65
157.74	65	157.98	65	158.53	65	158.78	65	158.97	65
159.19	65	159.81	65	160.35	65	161.38	65	161.59	65
162.94	65	163.2	65	163.66	65	163.01	65	163.32	65
163.78	65	164.19	65	164.66	65	191.36	65.97	191.45	65.97
192.5	66	192.61	66	192.84	66	192.94	66	193.11	66
193.18	66	196.33	66.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
88.74	100.8	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.31	64.2		170.1	64.2	

Downstream Bridge Cross Section Data
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.67	2.98	68.2	3.47	68	4.64	67.69	6.91	67
7.84	66.66	9.19	66	11.71	65.12	12.62	65	13.04	64.84
13.44	64.68	13.73	64.59	15.22	64	16.14	63.68	17.98	63
19.81	62.33	20.51	62	22.11	61.58	24.07	61	25.71	60.63
26.19	60.54	26.98	60.31	28.58	60.12	28.81	60.08	29.29	60
30.85	59.78	32.04	59.53	32.64	59.47	33.46	59.34	34.44	59.22
34.86	59.18	35	59.12	35.1	59.12	35.94	59	44.06	58.4
47.77	58	47.99	58	54.22	57.06	54.54	57	54.62	57
54.85	57	55.31	57	57.75	56.57	59.26	56.41	60.28	56.22
61.62	56	62.1	57	64.11	56	47.03	56.32	68.58	56.52

71.56	57	75.85	57.6	77.42	57.64	78.11	57.66	82.6	58
91.1	58.71	92.2	58.78	92.7	58.79	95.98	58.98	96.18	59
96.21	59	96.9	59.13	97.13	59.14	97.27	59.14	98.12	59.29
98.4	59.3	98.72	59.31	99.09	59.33	99.54	59.35	103.4	59.75
107.12	60	107.35	60	107.69	60	107.84	60	108.32	60
109.69	60.22	110.51	60.36	111.16	60.46	113.35	60.64	113.9	60.71
114.28	60.75	114.71	60.81	116.43	61	121.21	61.72	124.02	62
124.69	62.1	125.34	62.15	128.26	62.42	128.9	62.48	130.52	62.61
135.61	63	135.84	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.51	145.5	63.34	146.25	63.22	146.9	63.25	147.53	63.08
148.05	63	148.54	63	148.58	63	149.34	63.08	152.17	63.21
154.6	63.3	155.44	63.46	155.82	63.37	159.36	63.3	160.41	63.3
160.98	63.31	161.82	63.33	163.61	63.43	163.99	63.46	165.51	63.62
166.6	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.14	64.5	174.56	64.53	175.07	64.55	175.38	64.61
176.14	64.65	176.85	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.87	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	188.7	65.47	189.42	65.51	190.05	65.53
190.81	65.57	191.31	65.59	196.34	66	196.82	66	196.89	66
197.21	66	198.6	66	201.13	66.13				

Manning's n Values num= 2

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	82.6	.055

Bank Sta: Left Right Coeff Contr. Expan.

47.77 82.6 .1 .3

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 = 60.73
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	3.048	3.05

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

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	%	33.181	.013	.013	0	.6	1

Number of Barrels = 2
Upstream Elevation = 57.9
Centerline Stations

Sta.	Sta.
91.15	94.45

Downstream Elevation = 56.45
Centerline Stations

Sta.	Sta.
61.26	64.56

CULVERT OUTPUT Profile #100 Culv Group: Culvert #1

Q Culv Group (m3/s)	137.48	Culv Full Len (m)	33.18
# Barrels	2	Culv Vel US (m/s)	7.39
Q Barrel (m3/s)	68.74	Culv Vel DS (m/s)	7.82
E.G. US. (m)	64.9[illegible]	Culv Inv El Up (m)	57.90
W.S. US. (m)	64.43	Culv Inv El Dn (m)	56.45
E.G. DS (m)	58.31	Culv Frctn Ls (m)	1.45
W.S. DS (m)	58.[illegible]	Culv Exit Loss (m)	3.47
Delta EG (m)	5.55	Culv Entr Loss (m)	1.04
Delta WS (m)	4.12	Q Weir (m3/s)	7.62
E.G. IC (m)	64.65	Weir Sta Lft (m)	42.[illegible]
E.G. OC (m)	64.[illegible]	Weir Sta Rgt (m)	134.71
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	60.[illegible]	Weir Max Depth (m)	0.15
Culv WS Outlet (m)	59.[illegible]	Weir Avg Depth (m)	0.12
Culv Nml Depth (m)	3.[illegible]	Weir Flow Area (m2)	13.[illegible]
Culv Crt Depth (m)	[illegible]	Min El Weir Flow (m)	64.20

Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 7

INPUT
Description: section7
Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.67	2.98	68.2	5.83	69	4.64	67.69	6.91	67
7.84	66.46	9.79	66	12.31	65.12	12.62	65	12.04	64.84
13.44	64.68	13.71	64.58	15.22	64	16.14	63.68	17.98	63
19.81	62.13	20.51	62	22.11	61.98	24.07	61	25.71	60.63
26.19	60.54	26.88	60.41	28.58	60.12	28.81	60.08	29.29	60
30.65	59.78	32.04	59.55	32.64	59.47	33.46	59.34	34.44	59.22
34.86	59.15	35	59.13	35.1	59.12	35.94	59	44.06	58.4
47.77	58	47.99	58	54.25	57.06	54.54	57	54.62	57
54.85	57	55.01	57	57.76	56.57	59.26	56.41	60.28	56.22
61.42	56	62.91	56	64.33	56	67.03	56.32	68.59	56.52
71.26	57	75.95	57.6	77.42	57.64	78.11	57.66	82.6	58
91.1	58.71	92.2	58.78	92.7	58.79	95.98	58.98	96.18	59
96.21	59	96.97	59.13	97.12	59.14	97.27	59.14	98.12	59.29
98.4	59.3	98.72	59.31	99.09	59.33	99.54	59.35	103.4	59.75
107.12	60	107.35	60	107.89	60	107.84	60	108.32	60
109.69	60.22	110.51	60.36	111.16	60.46	113.35	60.64	113.9	60.71
114.28	60.75	114.71	60.81	118.43	61	121.21	61.72	124.02	62
124.69	62.1	125.34	62.15	128.29	62.42	128.9	62.48	130.52	62.61
135.81	63	135.94	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.31	145.5	63.34	146.25	63.22	146.9	63.25	147.53	63.08
149.05	63	148.54	63	148.59	63	149.34	63.08	152.17	63.21
154.8	63.3	155.44	63.36	155.92	63.37	159.36	63.3	160.41	63.3
162.48	63.31	161.82	63.39	163.61	63.43	163.99	63.46	165.51	63.62
166.6	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.24	64.5	174.56	64.53	175.07	64.55	175.38	64.61
176.14	64.69	176.65	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.67	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	188.7	65.47	189.42	65.51	190.05	65.53
190.01	65.57	191.31	65.59	196.34	66	196.82	66	198.89	66
197.21	66	198.6	66	201.13	66.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	82.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.77	82.6	87.755	79.88	79.044	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	58.81	Element			
Vel Head (m)	0.60	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	58.21	Reach Len. (m)	87.75	79.88	79.04
Crit W.S. (m)	58.21	Flow Area (m2)	0.21	42.21	0.27
E.G. Slope (m/m)	0.010655	Area (m2)	0.21	42.21	0.27
Q Total (m3/s)	145.09	Flow (m3/s)	0.12	144.82	0.15
Top Width (m)	38.38	Top Width (m)	1.97	34.83	2.54
Vel Total (m/s)	3.40	Avg. Vel. (m/s)	0.55	3.43	0.56
Max Chl Dpth (m)	2.21	Hydr. Depth (m)	0.11	1.21	0.11
Conv. Total (m3/s)	1062.3	Conv. (m3/s)	0.8	1060.4	1.1
Length Wtd. (m)	80.21	Wetted Per. (m)	1.98	35.11	2.55
Min Ch El (m)	56.00	Shear (N/m2)	19.29	219.89	19.34
Alpha	1.02	Stream Power (N/m s)	10.69	754.51	10.74
Frctn Loss (m)	1.44	Cum Volume (1000 m3)	8.30	42.08	12.92
C & E Loss (m)	0.05	Cum DA (1000 m2)	7.32	29.19	14.23

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 9

INPUT
Description: section9
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.94	1.93	66.81	2.09	66.8	2.29	66.79	2.51	66.77
2.74	66.76	3.61	66.68	6.34	66.43	7.71	66.34	11.35	66
18.64	65.17	19.44	65.16	20.52	65.05	20.66	65	22.75	64.66
23.19	64.57	26.18	64.4	26.29	64.33	25	64.28	25.79	64
26.4	63.74	29.41	[illegible]	28.73	62.45	30.85	62	31.87	61.42
32.54	61	33.81	60.5	34.12	60	34.58	59.72	35.98	59
37.74	58.08	37.42	58	38.12	57.5	38.17	57.88	39.41	57.22
39.82	57	41.29	56.22	42.21	56	43.31	56	43.38	56

41.74	56	44.65	56	51.59	56	52.18	56	57.46	56
59.02	56	58.37	56	58.68	56	59.05	56	60.02	56
60.54	56	60.95	56	61.22	56	60.18	55.3	81.8	55.23
86.4	55.05	87.51	55	88.38	55	90.25	55	93.96	55.63
94.87	55.79	95.24	55.85	96.49	56	98.03	56	98.11	56
101.28	56.32	103.91	56.16	105.56	56.45	113.54	57	115.71	57.53
116.26	57.58	116.52	57.6	116.99	57.65	124.67	58.75	133.02	58.97
133.15	59	133.96	59	134.04	59	134.31	59	137.46	59
139.23	59.04	140.3	59.07	140.32	59.07	141.15	59.12	141.9	59.16
142.17	59.19	142.55	59.24	143.14	59.3	146.7	59.6	147.64	59.75
147.89	59.76	148.79	59.82	149.28	60	150.51	60.17	153.43	60.46
153.97	60.49	154.29	60.51	154.86	60.54	155.38	60.56	155.85	60.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.46	.045	98.03	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.46	98.03	53.379	63.611	75.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	57.04	Element			
Vel Head (m)	0.57	Wr. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	56.47	Reach Len. (m)	53.38	63.61	75.40
Crit W.S. (m)	56.50	Flow Area (m2)	7.10	37.67	1.83
E.G. Slope (m/m)	0.027012	Area (m2)	7.10	37.67	1.83
Q Total (m3/s)	145.85	Flow (m3/s)	12.31	130.71	2.07
Top Width (m)	64.38	Top Width (m)	15.39	40.57	7.42
Vel Total (m/s)	4.11	Avg. Vel. (m/s)	1.73	3.47	1.13
Max Chl Dpth (m)	1.47	Hydr. Depth (m)	0.44	0.93	0.23
Conv. Total (m3/s)	882.8	Conv. (m3/s)	74.9	795.3	12.6
Length Wtd. (m)	61.82	Wetted Per. (m)	16.05	40.67	7.83
Min Ch El (m)	55.00	Shear (N/m2)	117.12	245.32	61.69
Alpha	1.15	Stream Power (N/m s)	203.13	851.11	78.14
Frctn Loss (m)	1.77	Cum Volume (1000 m3)	7.99	38.89	12.83
C & E Loss (m)	0.01	Cum SA (1000 m2)	6.54	26.18	13.42

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section7
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.02	.42	63	1.83	62.9	11.45	61.12	13.14	62.01
13.19	62	13.23	61.98	13.31	61.98	15.18	61.69	15.3	61.4
17.03	61.32	19.04	61.06	19.99	61.04	20.34	61	21.42	60.85
21.44	60.79	22.48	60.44	24.06	60	26.19	59.44	28	59.05
28.61	58.5	31.2	59	33.47	58.53	35.88	58	39.91	57.27
41.38	57	42.1	56.87	47.03	56	59.72	55.19	62.1	55
62.47	55	62.72	55	63.87	55	63.92	54.74	64.91	54.54
65.42	54.49	66.05	54.33	66.38	54.38	66.44	54.19	68.65	54.23
76.18	54	79.35	54	80.16	54	81.33	54	81.51	54.12
81.54	54.12	82.07	54.32	82.31	54.42	82.47	54.36	83.22	54.59
83.23	54.51	83.93	54.59	86.74	54.66	91.23	54.48	92.23	54.42
93.13	54.36	100.32	54.03	100.85	54	101.14	53.96	107.7	53.74
108.13	54	110.36	54.05	110.71	54.6	111.08	54.59	111.43	54.54
112.34	54.62	112.63	54.67	115.58	55	115.87	55	115.74	55
117.17	55.16	122.05	55.6	122.39	55.71	122.61	55.77	124.53	56
124.63	56	125.59	56	127.8	56	128.24	55.88	128.85	55.49
128.36	55.99	128.37	55.99	128.38	55.99	129.16	55.95	129.19	55.94
129.22	55.98	129.25	55.96	129.27	55.96	134.61	55.88	134.77	55.88
134.84	55.83	135.05	55.8	135.39	55.8	136.43	55.96		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	86.74	.045	110.36	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
86.74	110.36	77.74	135.116	210.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]	Element			
Vel Head (m)	[illegible]	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	[illegible]	Reach Len. (m)	77.74	135.11	210.38
Crit W.S. (m)	[illegible]	Flow Area (m2)	15.87	34.37	[illegible]
E.G. Slope (m/m)	[illegible]	Area (m2)	15.87	34.37	[illegible]
Q Total (m3/s)	[illegible]	Flow (m3/s)	56.40	91.42	[illegible]
Top Width (m)	[illegible]	Top Width (m)	11.68	22.42	11.11
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)	1.57	2.37	[illegible]

Max Ch Dpth (m)	1.85	Hydr. Depth (m)	1.06	1.46	0.59
Conv. Total (m3/s)	1741.4	Conv. (m3/s)	676.9	977.2	87.3
Length Wtd. (m)	125.99	Wetted Per. (m)	33.93	23.75	11.69
Min Ch El (m)	53.79	Shear (N/m2)	71.98	98.52	39.92
Alpha	1.18	Stream Power (N/m s)	113.16	233.40	42.37
Frctn Loss (m)	1.38	Cum Volume (1000 m3)	6.83	36.60	12.51
C & E Loss (m)	0.01	Cum SA (1000 m2)	5.21	24.14	13.08

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

CROSS SECTION

RIVER: 1
REACH: 1 RS: 6

INPUT
Description: section6
Station Elevation Data num= 227

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.56	.2	59.52	1.41	59.3	1.71	59.24	2.93	59
3.56	58.86	4.36	58.71	7.02	58.29	8.75	58	9.06	57.92
9.16	57.89	10.42	57.51	10.73	57.44	13.72	57	15.57	56.7
20.68	56	22.55	55.76	22.7	55.73	22.83	55.71	22.98	55.68
23.2	55.65	23.47	55.61	23.86	55.57	24.32	55.54	24.72	55.53
25	55.5	25.37	55.5	25.8	55.47	26.62	55.39	27.29	55.32
28.19	55.22	29.38	55.09	30.23	55	30.53	54.97	30.57	54.97
31.63	54.87	32.54	54.82	33.11	54.8	33.65	54.78	34.31	54.75
37.11	54.65	37.91	54.62	38.53	54.59	39.07	54.58	39.59	54.56
40	54.54	40.39	54.5	40.86	54.48	41.29	54.44	42.46	54.36
42.81	54.33	43.14	54.3	43.44	54.28	43.77	54.29	43.98	54.28
44.19	54.28	44.58	54.27	44.86	54.27	56.19	54.01	56.2	54.01
56.21	54.01	56.22	54.01	56.23	54.01	56.24	54.01	56.25	54.01
56.26	54.01	56.4	54	62.63	53.83	62.78	53.82	62.93	53.82
63.09	53.81	65.85	53.69	66.15	53.7	67.97	53.8	72.69	53.62
73.28	53.6	75.93	53.66	76.63	53.63	77.12	53.61	77.43	53.59
81.12	53.65	98.72	53	100.13	53	111.58	53	111.82	53
113.29	53	113.95	53	115.34	53	116.78	53	120.65	53
125.12	53.36	126.34	53.45	130.03	53.74	133.58	53.98	133.82	54
133.84	54	133.96	54	148.64	54.39	149.02	54.42	153.27	54.35
153.46	54.37	154.02	54.36	155.44	54.28	155.56	54.29	156.1	54.26
158.58	54	158.8	54	158.82	54	158.9	54	162.42	54.46
167.23	55	167.64	55	167.69	55	167.73	55	168.56	55
168.64	55	169.43	55	169.54	55	169.68	55	170.46	55
170.6	55	170.72	55	171.43	55	171.6	55	171.78	55
172.19	55	172.36	55	172.64	55	173.38	55	173.54	55
173.68	55	173.85	55	181.83	55.53	204.25	55.8	207.94	55.9
208.08	55.9	208.45	55.91	208.57	55.91	211.31	56	211.68	56.28
212.56	57	213.35	57.63	213.94	58	214.29	58.34	215.09	59
216.29	59.92	216.39	60	216.47	60.07	216.69	60.24	217.66	61
218.22	61.42	218.95	62	219.58	62.52	220.26	63	220.97	63.54
221.61	64	222.81	64.95	223.89	65	222.96	65.06	223.1	65.17
224.29	66	224.89	66.44	225.59	67	226.46	67.62	226.9	68
229.3	68.42	233.9	69	236.22	69.28	236.46	69.3	236.89	69.33
237.46	69.38	238.23	69.45	239.16	69.54	240.25	69.64	241.26	69.73
242.54	69.85	244.26	70	244.42	70	244.51	70	247.74	70.17
248.86	70.22	249.85	70.27	250.17	70.29	251.34	70.36	251.78	70.39
252.49	70.43	253.2	70.49	258.82	71	262.3	71	262.66	71
263.01	71	264.55	71	267.45	71	268.91	71	269.54	71
270.56	71	271.45	71	273.01	71	275.53	71	279.24	71
279.82	70.9	279.96	70.88	280.37	70.82	280.58	70.78	281.31	70.71
281.66	70.63	282.22	70.52	283.88	70.27	284.47	70.18	285.45	70.11
285.6	70.09	286.31	70.1	286.4	70.09	286.48	70.1	287.18	70.14
287.65	70.21	288.63	70.34	289.17	70.45	289.48	70.55	292.36	71
294.84	71.18	294.93	71.18	295.41	71.26	296.9	71.3	297.53	71.36
298.56	71.37	298.77	71.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	30.53	.045	181.83	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
30.53	181.83	40.348	115.83	209.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	54.48	Element	Left OB	Channel	Right OB
Vel Head (m)	0.28	Wt. n-Val.		0.045	
W.S. Elev (m)	54.20	Reach Len. (m)	40.35	115.83	209.39
Crit W.S. (m)	54.15	Flow Area (m2)		63.99	
E.G. Slope (m/m)	0.010258	Area (m2)		63.99	
Q Total (m3/s)	149.19	Flow (m3/s)		149.19	
Top Width (m)	97.24	Top Width (m)		97.24	
Vel Total (m/s)	2.33	Avg. Vel. (m/s)		2.33	

Max Chl Dpth (m)	1.25	Hydr. Depth (m)			5.68	
Conv. Total (m3/s)	1075.1	Conv. (m3/s)			1075.1	
Length Wtd. (m)	115.17	Wetted Per. (m)			97.33	
Min Ch El (m)	52.00	Shear (N/m2)			124.15	
Alpha	1.00	Stream Power (N/m s)			289.47	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	5.44		29.96	11.78
C & E Loss (m)	0.06	Cum WA (1000 m2)	3.40		15.98	11.86

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 5

INPUT
Description: section5
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.08	.18	58	1.56	57.42	2.87	57	4.31	56.18
5.01	56	6.07	55.86	6.35	55.49	6.49	55.39	6.82	55.26
7.28	55.07	7.43	55	8.26	54.83	9.03	54.28	9.27	54.17
9.66	54	9.83	53.93	10.04	53.84	11.76	53	12.65	52.13
13.91	52	15.45	52	16.13	52	24.4	52	24.73	52
25.17	52	25.82	52	29.82	52	30.51	51.65	32.1	51
33.57	51	33.85	51	34.2	51	35.85	51.21	39.43	51.6
40.19	51.69	40.84	51.73	41.72	51.8	42.48	51.87	42.59	51.88
42.88	51.9	42.97	51.91	43.14	51.92	44.16	51.95	44.29	51.95
44.73	51.96	45.09	51.96	45.2	51.96	46.35	52	48.27	52
49.16	52	49.33	52	50.91	52	51.11	52	51.9	52
54.02	52	55.2	52	55.62	52	56.39	52	56.88	52
59.4	52	74.85	52.64	75.53	52.86	76.34	52.89	76.55	52.9
78.14	52.94	78.52	52.96	78.57	52.96	79.41	53	79.51	53
80.12	53	80.39	53	81.82	53	84.33	53	84.45	53
84.71	53	86.61	53	87.72	53	88.19	53	92.40	53
94.13	53	95.13	53	96.06	53.07	96.65	53.08	99.21	53.16
99.62	53.19	100.12	53.18	102.69	53.26	103.15	53.26	109.86	53.42
110.37	53.43	120.68	53.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	29.82	.045	44.16	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.82	44.16	120.276	71.551	24.002	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	57.82	Element	Left OB	Channel	Right OB
Vel Head (m)	0.09	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	57.73	Reach Len. (m)	120.28	71.55	24.00
Crit W.S. (m)		Flow Area (m2)	30.67	32.42	70.08
E.G. Slope (m/m)	0.002179	Area (m2)	30.67	32.42	70.08
Q Total (m3/s)	149.19	Flow (m3/s)	84.37	57.41	57.51
Top Width (m)	104.54	Top Width (m)	19.55	14.14	72.85
Vel Total (m/s)	1.12	Avg. Vel. (m/s)	1.12	1.76	0.82
Max Chl Dpth (m)	2.10	Hydr. Depth (m)	1.57	2.29	5.96
Conv. Total (m3/s)	1225.6	Conv. (m3/s)	743.1	1210.1	1241.4
Length Wtd. (m)	65.93	Wetted Per. (m)	19.94	14.60	72.89
Min Ch El (m)	51.00	Shear (N/m2)	32.27	46.88	20.22
Alpha	1.29	Stream Power (N/m s)	36.16	82.35	16.60
Frctn Loss (m)	1.10	Cum Volume (1000 m3)	4.82	24.36	4.45
C & E Loss (m)	0.00	Cum WA (1000 m2)	1.51	9.51	4.26

CROSS SECTION

RIVER: 1
REACH: 1 RS: 4

INPUT
Description: section4
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.04	[illegible]	[illegible]	1.23	57	2.12	57	4	57
6.36	57	11.85	[illegible]	13.07	56	14.07	55.83	14.24	55.8
14.45	55.76	14.8	[illegible]	15.21	55.64	16.11	55.49	16.72	55.38
17.03	55.19	18.28	[illegible]	[illegible]	55.01	18.78	55	19.81	54.78
20.94	54.51	21.63	[illegible]	22.1	54.25	22.41	54.18	22.61	54.14
22.7	54.11	23.21	[illegible]	23.84	53.99	27.6	53	29.02	52.71

30.25	52.4	31.49	52	32.05	52	32.11	52	37.67	51.59
45.67	51	50.44	51	51.86	51	51.88	51	52.37	51
61.96	51.33	64.4	51.41	66.37	51.47	74.58	51.68	82.76	51.86
82.88	51.96	86.92	52	87.97	52.07	88.93	52.16	94.66	52.63
98.58	53	102.7	53.35	109.95	54	111.33	54.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	37.67	.045	74.58	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
37.67	74.58	67.853	54.387	41.471	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	53.71	Element			
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.63	Reach Len. (m)	67.85	54.39	41.47
Crit W.S. (m)		Flow Area (m2)	16.24	86.76	38.11
E.G. Slope (m/m)	0.001205	Area (m2)	16.24	86.76	38.11
Q Total (m3/s)	157.51	Flow (m3/s)	11.84	118.27	27.40
Top Width (m)	81.07	Top Width (m)	12.88	36.91	31.28
Vel Total (m/s)	1.12	Avg. Vel. (m/s)	0.73	1.36	0.72
Max Chl Dpth (m)	2.63	Hydr. Depth (m)	1.26	2.35	1.22
Conv. Total (m3/s)	4536.9	Conv. (m3/s)	341.0	3406.8	789.1
Length Wtd. (m)	53.63	Wetted Per. (m)	13.08	36.94	31.35
Min Ch El (m)	51.00	Shear (N/m2)	14.67	27.76	14.37
Alpha	1.22	Stream Power (N/m s)	10.70	37.84	10.33
Frctn Loss (m)	0.02	Cum Volume (1000 m3)	2.00	20.09	3.15
C & E Loss (m)	0.02	Cum SA (1000 m2)	1.56	7.68	3.01

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 3

INPUT
Description: section3
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.74	.19	56.7	1.07	56.14	3.42	56	5.27	55.21
5.77	55	7.89	54.1	8.03	54.04	8.11	54	8.41	53.87
10.44	53	11.61	52.42	13.62	52	15.47	51.89	16.02	51.86
17.65	51.77	18.58	51.7	22.98	51.44	35.58	51	38.19	51
38.33	51	38.44	51	48.73	51	54.38	51	55.08	51
55.37	51	55.58	51	56.33	51	56.75	51	59.24	51
59.1	51	59.68	51	63.73	51	66.32	51	68.54	51
70.83	51	73.61	51	85.07	51	92.41	51	94.8	51
97.75	51	98.35	51	103.36	51	103.46	51	103.49	51
108.54	51	114.24	51.79	114.61	51.82	117.21	52	126.57	52.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	15.47	.045	114.24	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.47	114.24	27.563	41.901	57.302	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	53.67	Element			
Vel Head (m)	0.02	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.65	Reach Len. (m)	27.56	41.90	57.30
Crit W.S. (m)		Flow Area (m2)	7.33	249.93	17.77
E.G. Slope (m/m)	0.000220	Area (m2)	7.33	249.93	17.77
Q Total (m3/s)	160.90	Flow (m3/s)	2.07	153.03	5.79
Top Width (m)	117.65	Top Width (m)	6.55	98.77	12.33
Vel Total (m/s)	0.59	Avg. Vel. (m/s)	0.28	0.61	0.33
Max Chl Dpth (m)	2.65	Hydr. Depth (m)	1.12	2.53	1.44
Conv. Total (m3/s)	10839.6	Conv. (m3/s)	139.7	10309.7	390.2
Length Wtd. (m)	41.67	Wetted Per. (m)	6.84	98.82	13.39
Min Ch El (m)	51.00	Shear (N/m2)	2.32	5.46	2.87
Alpha	1.06	Stream Power (N/m s)	0.65	3.35	0.93
Frctn Loss (m)	0.02	Cum Volume (1000 m3)	1.20	10.93	1.99
C & E Loss (m)	0.01	Cum SA (1000 m2)	0.90	3.99	2.10

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 2

INPUT
Description: section2
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57	.32	57	.77	57	1.39	57	3.81	57
4.27	57	9.19	57	12.85	56.37	14.4	56.03	14.44	56.02
14.47	56.01	14.53	56	14.62	55.98	14.69	55.98	18.83	55
22.37	54.15	22.39	54	23.66	53.86	27.47	53	29.51	52.53
30.38	52.34	31.44	52.13	32.15	52	37.1	51.47	42.18	51
42.2	51	42.35	51	43	51	43.63	51	43.88	51
49.58	50.64	52.14	50.13	53.18	50.47	53.86	50.43	54.91	50.37
56.13	50.3	57.55	50.22	57.89	50.2	60.18	50.08	61.63	50
62.58	50	62.46	50	64.02	50	64.57	50	65.35	50.19
66.57	50.26	72.83	51	73.2	51	73.57	51.1	74.62	51.37
75.07	51.5	77.22	52	79.33	52.45	80.89	52.72	82.26	53
82.39	53.02	87.13	54	87.2	54.01	90.74	54.17	93.73	54.13
94.77	54	95.91	53.75	99.15	53	102.58	53	103.97	53
104.51	53.09	104.89	53.17	110.3	54	113.61	54.63	113.87	54.69
114.3	54.75	115.14	54.85	116.24	55	116.27	55	118.65	55.28
120	55.44	120.87	55.56	121.68	55.66	122.27	55.73	124.34	56
124.95	56.06	125.05	56.09	125.98	56.23	126.67	56.33		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	42.85	.045	72.83	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.85	72.83	30.006	48.691	69.949	.1	.3

CROSS SECTION OUTPUT Profile #100%

E.G. Elev (m)	55.65	Element	Left OB	Channel	Right OB
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	55.58	Reach Len. (m)	30.01	48.69	69.95
Crit W.S. (m)		Flow Area (m2)	28.37	92.93	19.41
E.G. Slope (m/m)	-0.000876	Area (m2)	28.37	92.93	19.41
Q Total (m3/s)	160.90	Flow (m3/s)	20.61	129.70	10.59
Top Width (m)	70.42	Top Width (m)	17.87	29.88	22.77
Vel Total (m/s)	1.14	Avg. Vel. (m/s)	0.73	1.40	0.55
Max Chl Dpth (m)	1.58	Hydr. Depth (m)	1.59	3.10	0.85
Conv. Total (m3/s)	5435.9	Conv. (m3/s)	696.2	4381.8	357.8
Length Wtd. (m)	47.24	Wetted Per. (m)	18.09	30.27	23.15
Min Ch El (m)	50.00	Shear (N/m2)	13.47	26.15	7.20
Alpha	1.27	Stream Power (N/m s)	9.79	37.06	3.93
Frctn Loss (m)	0.37	Cum Volume (1000 m3)	0.71	1.75	0.93
C & E Loss (m)	0.01	Cum SA (1000 m2)	0.56	1.29	1.10

Warning: Divided flow computed for this cross-section.
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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 1

INPUT
Description: section1
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.42	3.84	58.45	4.16	58.5	4.58	58.42	5.78	58.40
7.18	58.46	9.87	58.5	11.37	58.51	14.08	58.45	16.74	58.51
16.84	58.3	20.18	58	24.19	55.67	24.29	55.63	24.62	55.59
24.87	55.59	25.46	55.48	26.08	55.4	26.34	55.34	27.14	55.24
28.26	55.12	28.23	55.1	29.21	55	28.48	54.98	30.49	54.82
30.84	54.77	31.12	54.72	32.21	54.14	33.36	54.1	33.74	54
34.92	53.39	37.14	53.46	40.19	53	40.99	52.88	41.16	52.84
42	52.68	42.53	52.62	43.56	52.38	44.14	52.33	44.51	52.28
44.72	52.25	44.79	52.24	45.09	52.23	47.83	52.21	51.21	52.22
51.83	52.15	54.37	52	57.34	52	58.06	52	58.25	52
58.44	52	58.69	52	59.26	52	59.59	52	60.11	51.7
61.03	51	63.23	50.12	63.48	50	63.85	50	64.06	50
64.85	50	66.89	50	69.26	50	69.48	50.1	70.08	51
79.25	51.98	80.48	51.97	80.64	52	87.95	52.91	88.69	53
88.83	53.12	89.95	54	90.83	54.89	90.93	55	91.41	55.19
91.89	55.36	92.19	55.5	94.2	56	98.67	56.32	98.85	57
100.54	57.43	103.13	58	104.83	58.4	107.56	59	108.36	59.19
108.55	59.24	108.78	59.27	109.01	59.32	109.31	59.38	110.04	59.52
111.41	59.78	112.5	60	113.42	60.18	116.96	61	117.48	61.14
121.17	62	123.15	62.4	125.63	63	127.61	63.44	130.24	64
131.98	64.46	132.35	64.52	132.78	64.6	132.9	64.7	133.59	65
133.98	65.11	134.23	65.14	134.68	65.23	137.25	65.59	137.28	65.79
137.27	65.89	137.32	66	137.44	66	138.34	66.15	140.24	66.38
140.47	66.41	141.32	66.55	141.5	66.75	144.56	67	148.17	67.11

148.39	67.15	156	67.5	159.68	67.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.36	.045	80.48	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.36	80.48		0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	53.56	Element			
Vel Head (m)	0.22	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.34	Reach Len. (m)			
Crit W.S. (m)	52.52	Flow Area (m2)	18.88	61.10	7.07
E.G. Slope (m/m)	0.002898	Area (m2)	18.88	61.10	7.07
Q Total (m3/s)	160.90	Flow (m3/s)	18.08	136.85	5.97
Top Width (m)	51.17	Top Width (m)	19.42	23.12	8.63
Vel Total (m/s)	1.85	Avg. Vel. (m/s)	0.96	2.24	0.84
Max Chl Dpth (m)	3.34	Hydr. Depth (m)	0.97	2.64	0.82
Conv. Total (m3/s)	2988.8	Conv. (m3/s)	335.8	2542.1	110.9
Length Wtd. (m)		Wetted Per. (m)	19.52	23.85	8.83
Min Ch El (m)	50.00	Shear (N/m2)	27.47	72.80	22.76
Alpha	1.23	Stream Power (N/m s)	26.32	163.06	19.22
Frctn Loss (m)		Cum Volume (1000 m3)			
C & E Loss (m)		Cum SA (1000 m2)			

SUMMARY OF MANNING'S N VALUES

River:1

Reach	River Sta.	n1	n2	n3
1	20	.055	.045	.055
1	19	.055	.045	.055
1	18	.055	.045	.055
1	17	.055	.045	.055
1	16	.055	.045	.055
1	15	.055	.045	.055
1	14	.055	.045	.055
1	13	.055	.045	.055
1	12	.055	.045	.055
1	11	.055	.045	.055
1	10	.055	.045	.055
1	9.5	Culvert		
1	9	.055	.045	.055
1	8	.055	.045	.055
1	7	.055	.045	.055
1	6	.055	.045	.055
1	5	.055	.045	.055
1	4	.055	.045	.055
1	3	.055	.045	.055
1	2	.055	.045	.055
1	1	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: 1

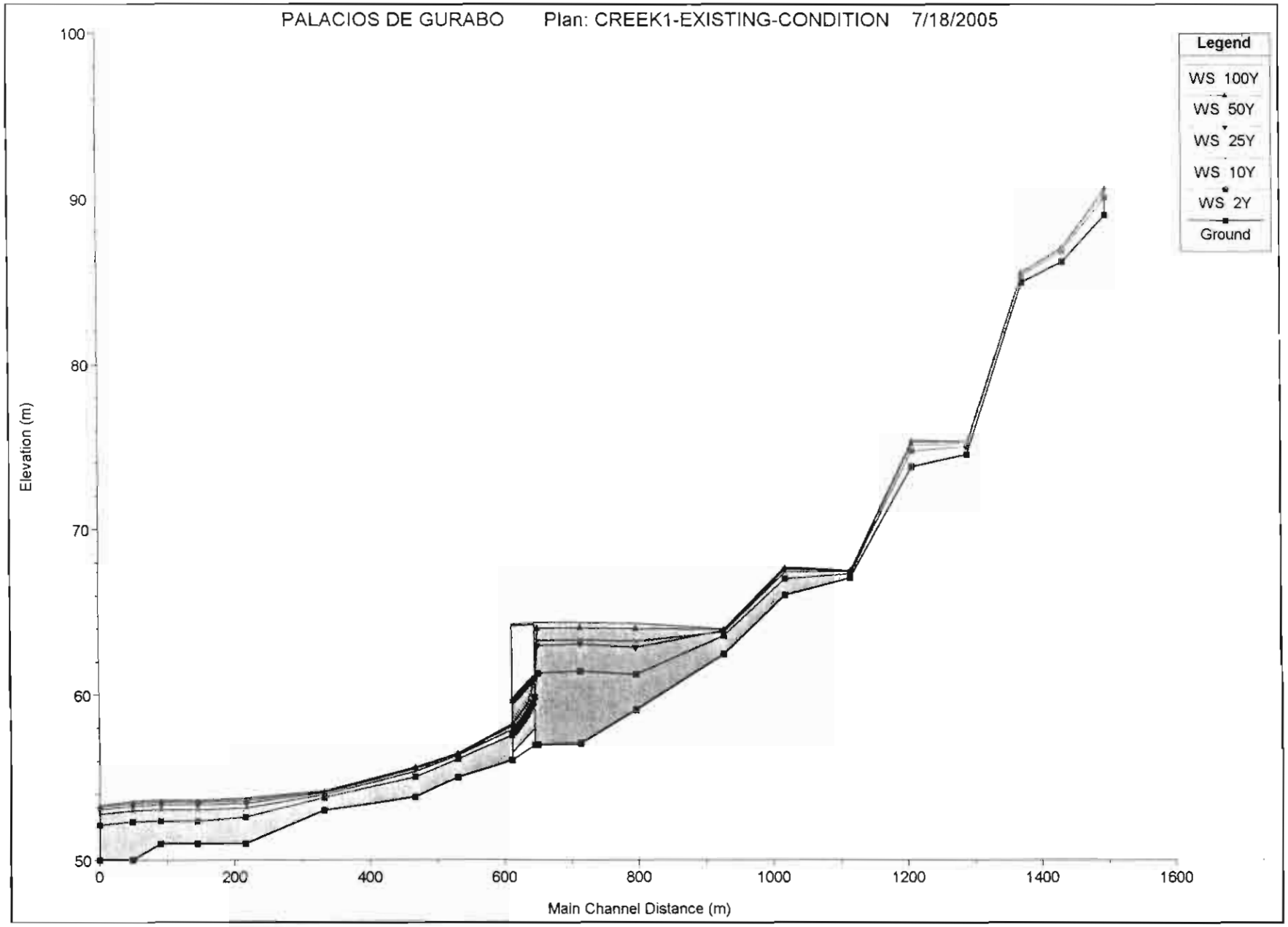
Reach	River Sta.	Left	Channel	Right
1	20	64.481	64.686	67.814
1	19	59.858	60.564	70.961
1	18	83.006	83.075	83.193
1	17	88.254	88.13	88.9
1	16	148.1	91.89	89.460
1	15	148.058	98.443	61.827
1	14	97.1	91.634	87.207
1	13	73.08	131.422	181.556
1	12	46.819	81.200	120.746
1	11	64.203	63.71	72.065
1	10	50.271	38.113	28.313
1	9.5	Culvert		
1	9	87.755	78.88	79.044
1	8	53.179	63.611	75.195
1	7	77.74	135.126	210.385
1	6	48.348	115.83	209.385
1	5	120.276	71.551	24.502
1	4	47.653	54.387	41.471
1	3	37.565	41.901	57.302
1	2	71.086	49.692	69.949
1	1	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1

Reach	River Sta.	Contr.	Expan.
1	20	.1	.3
1	19	.1	.3
1	18	.1	.3
1	17	.1	.3
1	16	.1	.3
1	15	.1	.3
1	14	.1	.3
1	13	.1	.3
1	12	.1	.3
1	11	.1	.3
1	10	.1	.3
1	9.5	Culvert	
1	9	.1	.3
1	8	.1	.3
1	7	.1	.3
1	6	.1	.3
1	5	.1	.3
1	4	.1	.3
1	3	.1	.3
1	2	.1	.3
1	1	.1	.3

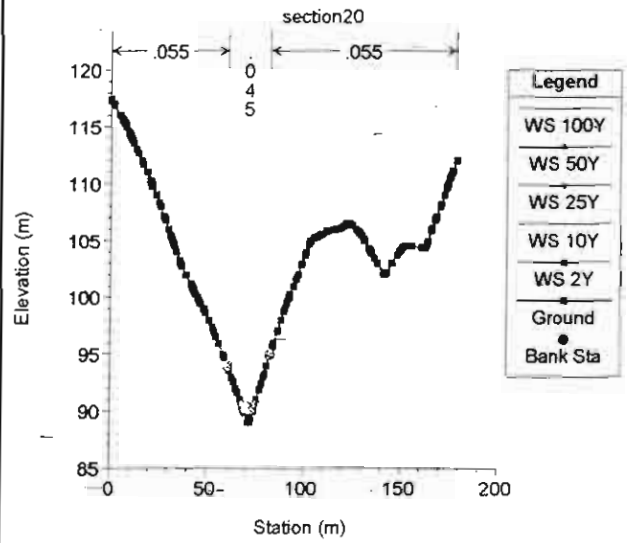
Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	20	100Y	21.97	89.00	90.72	90.72	91.21	0.023721	3.09	[illegible]	[illegible]	1.01
1	19	100Y	21.97	86.17	87.08	87.42	88.20	0.121247	4.67	4.70	9.78	2.15
1	18	100Y	21.97	84.30	85.57	85.57	85.76	0.027325	2.03	[illegible]	26.21	1.04
1	17	100Y	21.65	74.44	75.25	76.98	78.66	0.274874	7.44	[illegible]	10.01	1.39
1	16	100Y	82.02	73.70	75.34	75.34	75.92	0.017675	3.39	25.15	23.12	0.97
1	15	100Y	85.37	67.00	67.49	68.15	71.05	0.493187	8.39	10.22	23.15	4.05
1	14	100Y	85.37	65.98	67.73	67.73	69.10	0.019875	3.36	25.40	22.28	1.00
1	13	100Y	85.37	62.40	63.93	64.29	65.06	0.076692	4.39	19.47	29.16	1.85
1	12	100Y	85.37	59.00	64.30	62.18	64.41	0.001168	1.53	55.22	35.12	0.37
1	11	100Y	145.09	57.00	64.36		64.37	0.000066	0.63	142.39	72.99	0.08
1	10	100Y	145.09	56.00	64.33	61.32	64.34	0.000220	0.91	147.44	92.12	0.12
1	9.5		Culvert									
1	9	100Y	145.09	56.00	58.21	58.21	58.61	0.019655	3.43	42.29	59.34	0.89
1	8	100Y	145.09	55.00	56.47	56.59	57.04	0.027012	3.47	44.59	64.39	1.15
1	7	100Y	145.09	53.79	55.64	55.23	55.86	0.006942	2.37	77.79	98.61	0.62
1	6	100Y	189.19	53.00	54.20	54.15	54.48	0.019258	2.33	81.49	97.24	0.92
1	5	100Y	189.19	51.00	53.73		53.82	0.002139	1.76	133.37	109.54	0.37
1	4	100Y	157.51	51.00	53.63		53.73	0.001205	1.36	141.22	91.07	0.29
1	3	100Y	160.90	51.00	53.65		53.67	0.000220	0.61	[illegible]	[illegible]	0.12
1	2	100Y	160.90	50.00	53.56		53.63	0.000896	1.40	147.73	70.62	0.25
1	1	100Y	160.90	50.00	53.34	52.12	53.56	0.002098	2.24	87.04	51.17	0.48


PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005
Legend
WS 100Y
WS 50Y
WS 25Y
WS 10Y
WS 2Y
Ground
Elevation (m)
100
90
80
70
60
50
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (m)

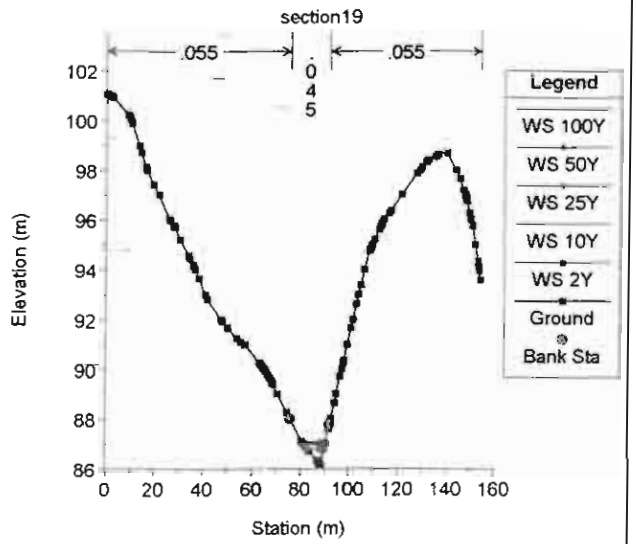
PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section20



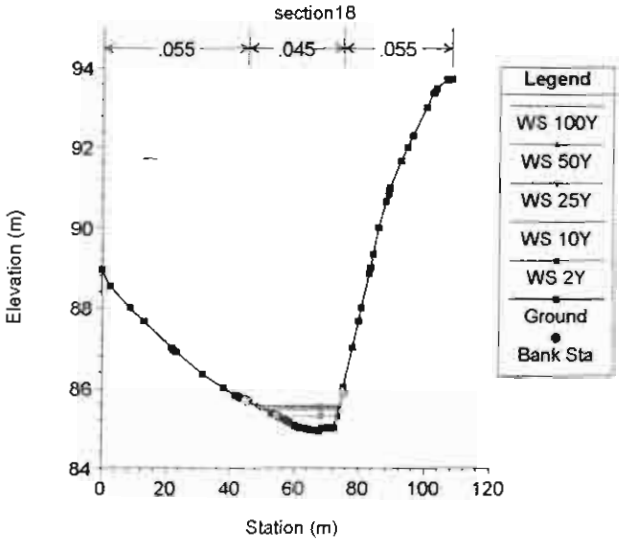
PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section19



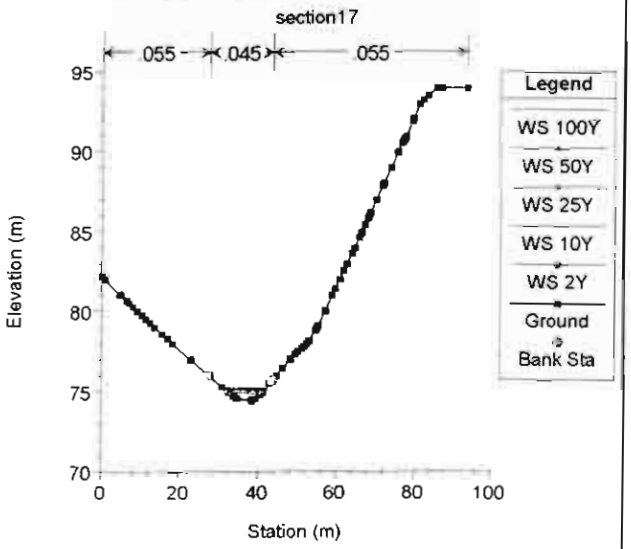
PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section18



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section17



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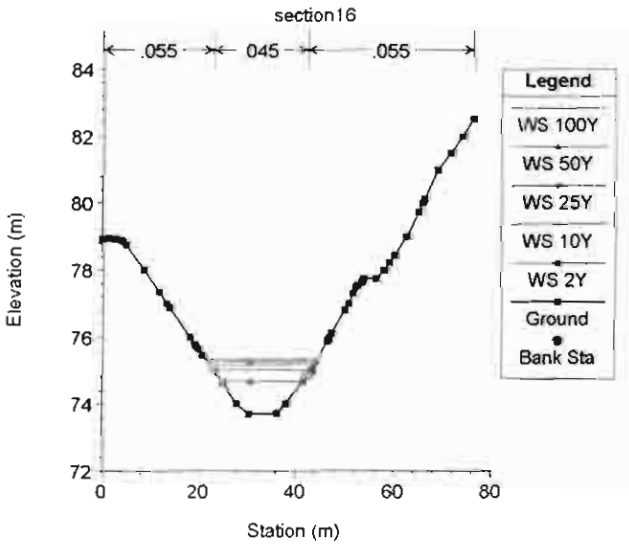
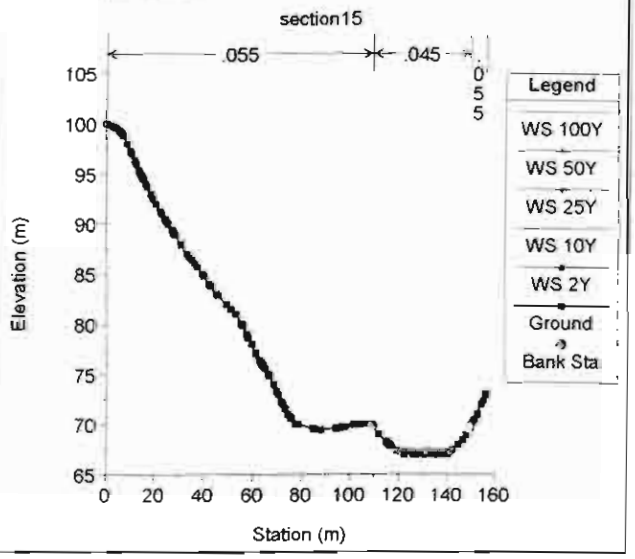


PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section15



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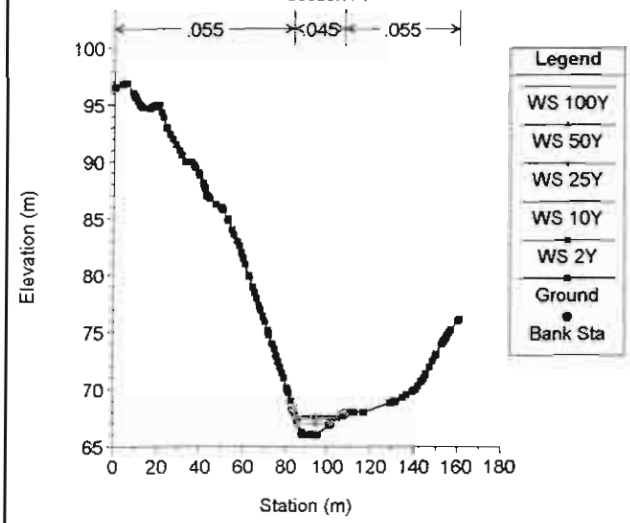
section14



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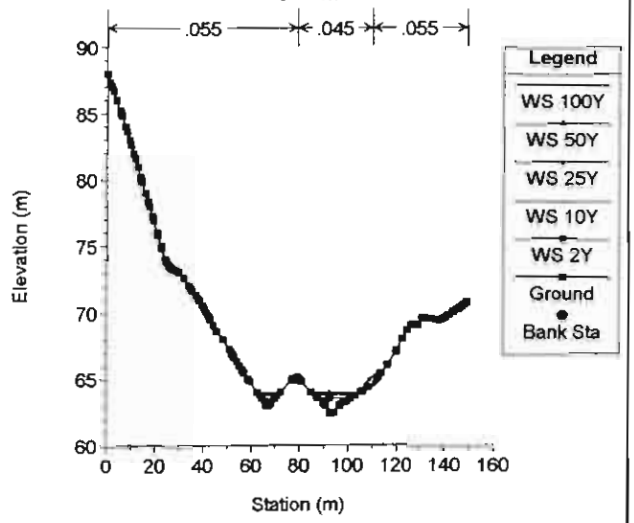
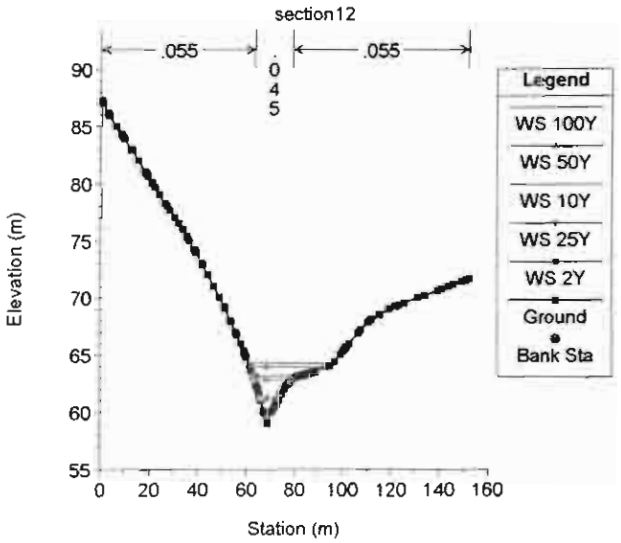


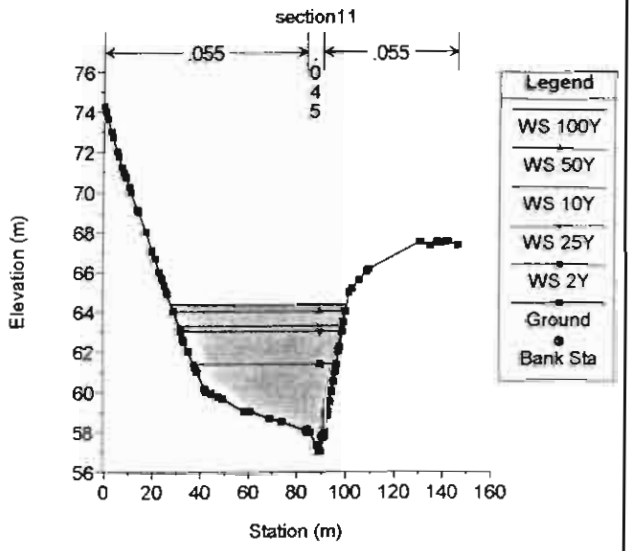
PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section12



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section11



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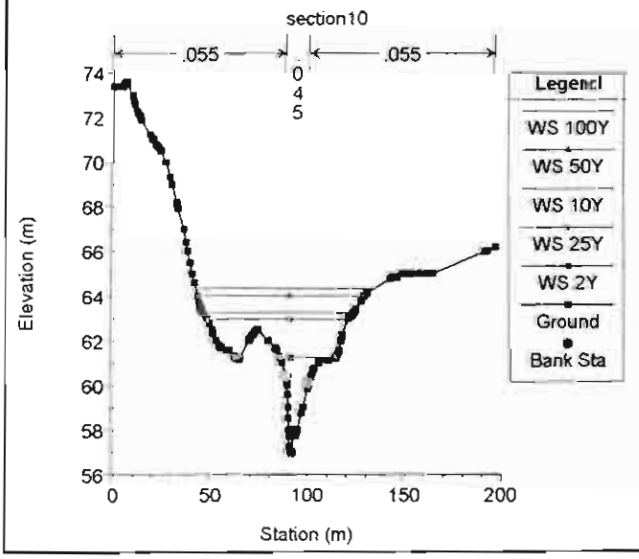
section10



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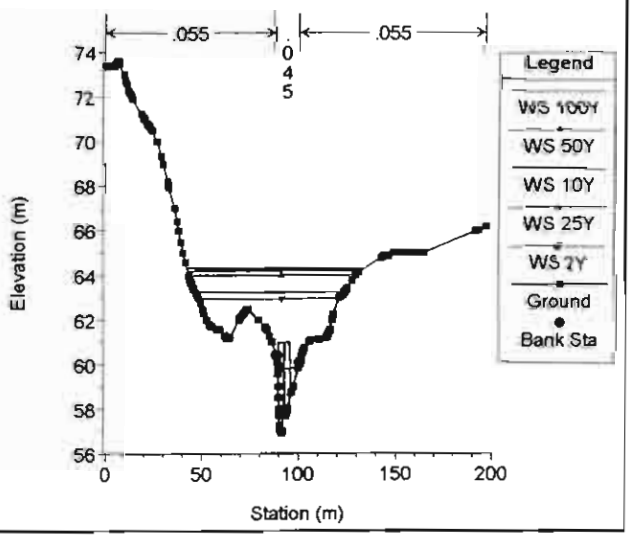

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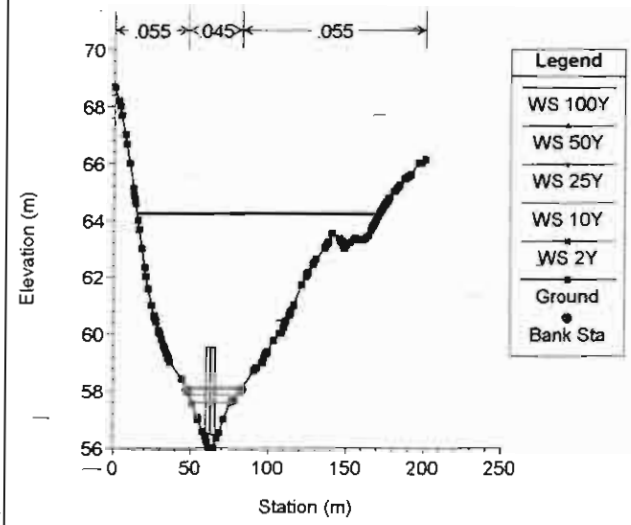
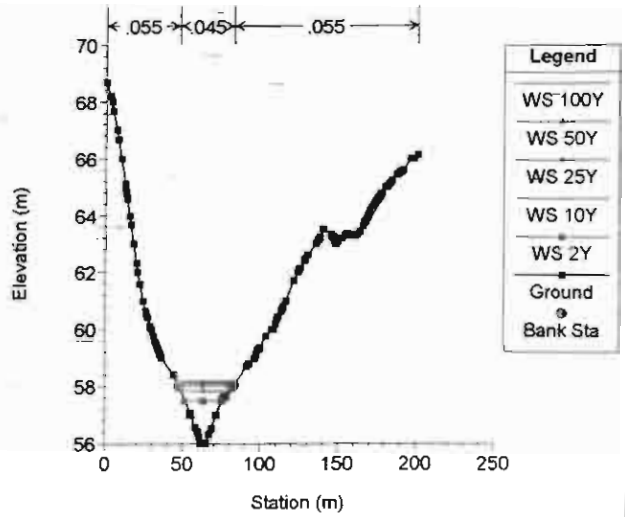


PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section9



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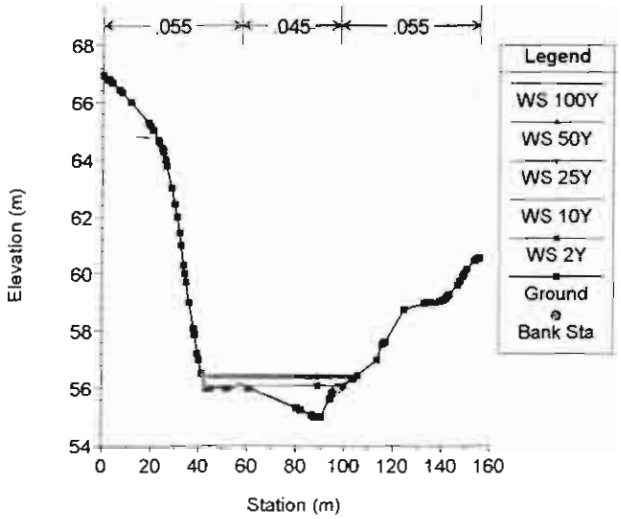
section8



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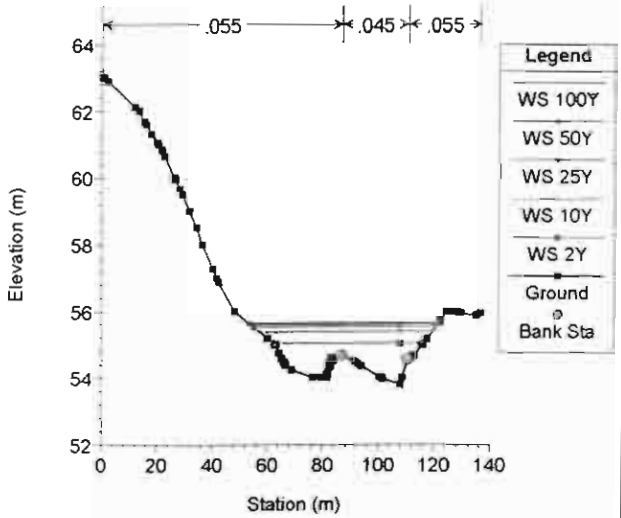

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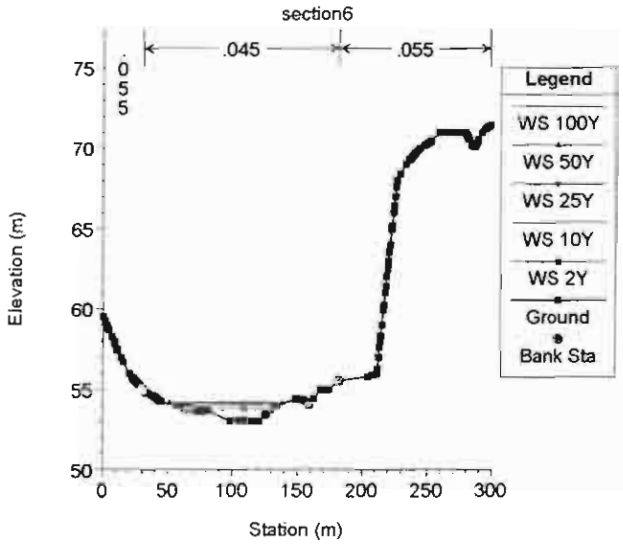

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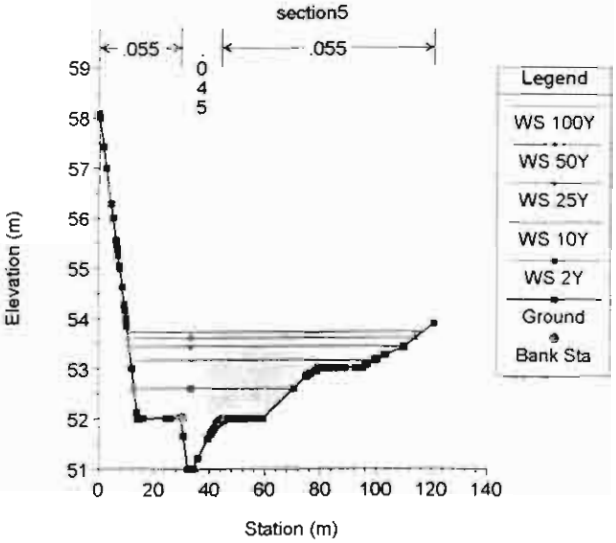
section5



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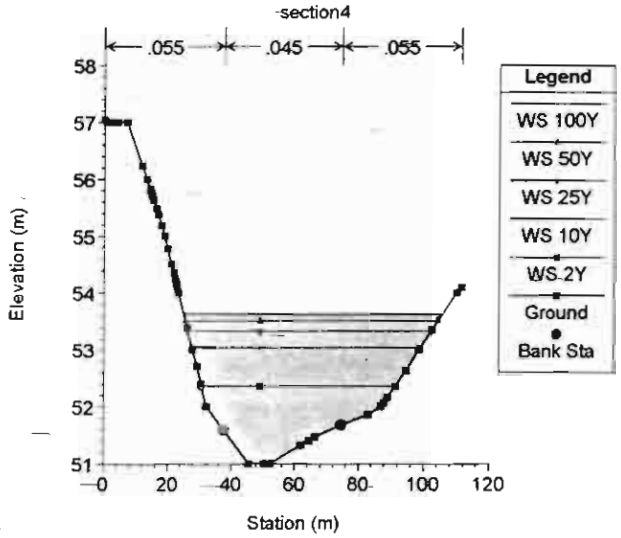

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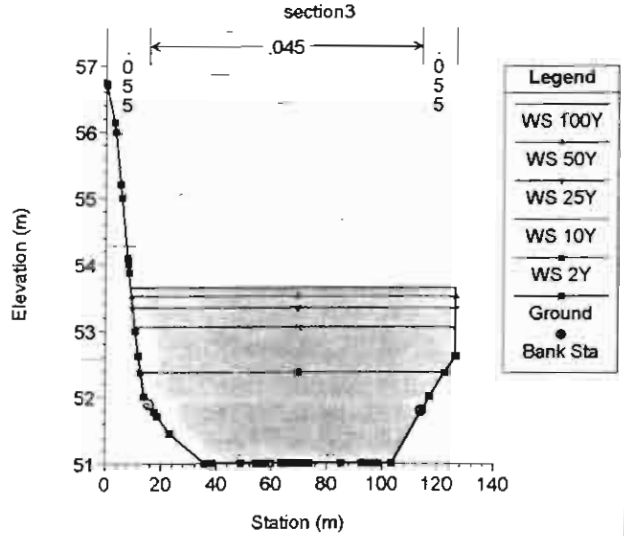

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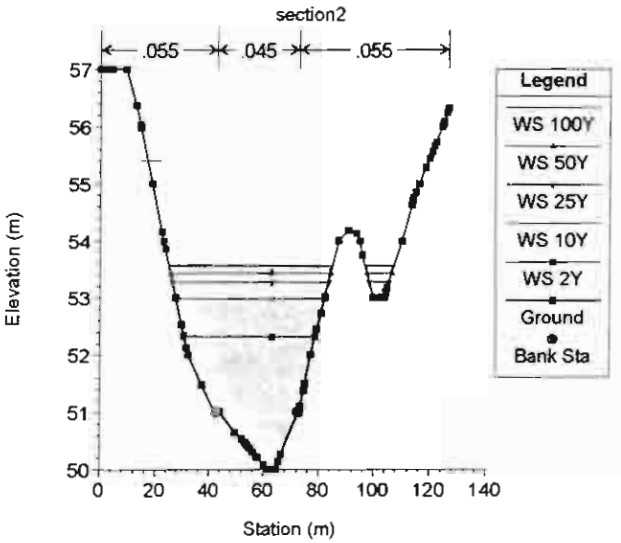

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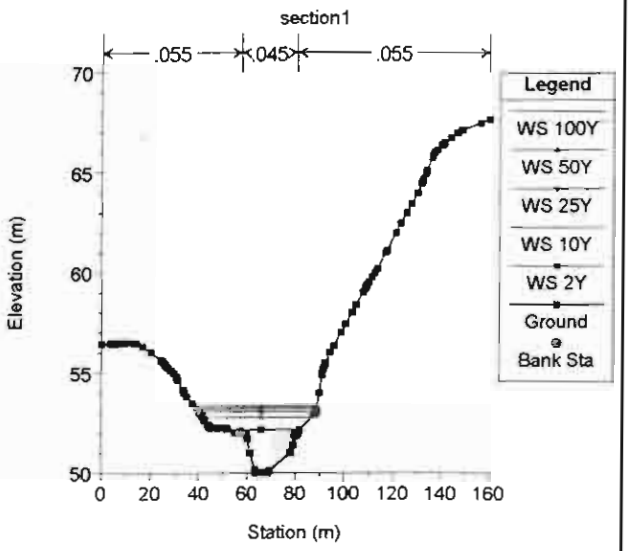

HEC-RAS Version 3.1.1 May 2003
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Hydrologic Engineering Center
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Davis, California 95616-4687
(916) 756-1104

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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: PALACIOS DE GURABO
Project File : CREEK1.prj
Run Date and Time: 7/18/2005 1:45:02 PM

Project in SI units

PLAN DATA

Plan Title: CREEK2-EXISTING-CONDITION
Plan File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.p01

Geometry Title: CREEK2-EXISTING-CONDITION
Geometry File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.g02

Flow Title : CREEK2-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f02

Plan Summary Information:

Number of:	Cross Sections =	10	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	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: Mixed Flow

FLOW DATA

Flow Title: CREEK2-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f02

Flow Data (m3/s)

River	Reach	RS	100Y	50Y	25Y	10Y	2Y
2	1	30	10.49	9.53	8.42	6.66	3.6
2	1	29	16.16	14.77	13.01	10.35	5.7
2	1	32	32.34	29.42	25.68	19.93	10.29

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
2	1	100Y	Critical	Normal S = 0.008
2	1	50Y	Critical	Normal S = 0.008
2	1	25Y	Critical	Normal S = 0.008
2	1	10Y	Critical	Normal S = 0.008
2	1	2Y	Critical	Normal S = 0.008

GEOMETRY DATA

```
                 8.        5.        1.        0.        1.        1.

    TOTAL RAINFALL =   11.70, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.42

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    708.      12.08                100.        35.         35.         35.
                          (INCHES)   9.062     10.589      10.589      10.589
                          (AC-FT)    53.        70.         70.         70.

                          CUMULATIVE AREA =     .12 SQ MI

      ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 1, RATIO =  .41

    TOTAL RAINFALL =    4.86, TOTAL LOSS =    1.15, TOTAL EXCESS =    3.71

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    261.      12.08                 19.         12.         12.         12.
                          (INCHES)   2.435      3.714       3.714       3.714
                          (AC-FT)    19.        25.         25.         25.

                          CUMULATIVE AREA =     .12 SQ MI

      ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 1, RATIO =  .67

    TOTAL RAINFALL =    7.97, TOTAL LOSS =    1.23, TOTAL EXCESS =    6.74

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    458.      12.08                 69.         22.         22.         22.
                          (INCHES)   3.180      6.720       6.720       6.720
                          (AC-FT)    34.        44.         44.         44.

                          CUMULATIVE AREA =     .12 SQ MI

      ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =    9.74, TOTAL LOSS =    1.25, TOTAL EXCESS =    8.50

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    573.      12.08                 87.         28.         28.         28.
                          (INCHES)   4.504      8.475       8.475       8.475
                          (AC-FT)    43.        56.         56.         56.

                          CUMULATIVE AREA =     .12 SQ MI

      ...          ...          ...          ...          ...

                          HYDROGRAPH AT STATION        P3
                            FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =   10.94, TOTAL LOSS =    1.27, TOTAL EXCESS =    9.68

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                              (CFS)
+    648.      12.16                 99.         32.         32.         32.
```

```
                    (INCHES)      7.370        9.640        9.649        9.649
                     (AC-FT)       49.          64.          64.          64.

                   CUMULATIVE AREA =      .12 SQ MI

   ...          ...          ...          ...          ...

                   HYDROGRAPH AT STATION        P3
                     FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =   11.00, TOTAL LOSS =    1.28, TOTAL EXCESS =   10.62

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    708.     12.08                 108.          35.          35.          35.
                          (INCHES)    5.062       10.589       10.589       10.589
                           (AC-FT)     53.          70.          70.          70.

                   CUMULATIVE AREA =      .12 SQ MI
```

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

            **************
            *            *
 51 KK      *    POND    *          P3
            *            *
            **************
                   RUNOFF MITIGATION POND CALCULATION

 53 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          3  PRINT CONTROL
                    IPLOT          1  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

 54 RS        STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRI       .00  INITIAL CONDITION
                        X       .00  WORKING R AND D COEFFICIENT

 56 SV          STORAGE        .0        .8       1.6       2.5       3.6       4.7       5.8       7.1       8.5       9.9

 57 SE        ELEVATION       .00      1.64      3.28      4.92      6.56      8.20      9.74     11.38     13.02     14.66

 58 SQ        DISCHARGE        0.        0.      209.      315.      394.      460.      642.      946.     1323.     1759.

                                                   ...

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     1323. TO     1759.
                THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
                THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

   ...          ...          ...          ...          ...

                   HYDROGRAPH AT STATION      POND
                     FOR PLAN 1, RATIO =   .48

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    244.     12.17                  59.          22.          22.          22.
                          (INCHES)    3.495       3.595        3.595        3.595
                           (AC-FT)     15.          24.          24.          24.

 PEAK STORAGE  TIME                          MAXIMUM AVERAGE STORAGE
                                     6-HR        24-HR        72-HR      24.00-HR
+ (AC-FT)      (HR)
      2.     12.17                    2.           1.           1.           1.
```

PEAK STAGE (FEET)	TIME (HR)		MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
3.83	12.17		1.36	1.23	1.23	1.23
		CUMULATIVE AREA =	.12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .67

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
401.	12.25	(CFS)	69.	22.	22.	22.
		(INCHES)	5.200	6.599	6.599	6.599
		(AC-FT)	34.	44.	44.	44.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
4.	12.25	1.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
6.74	12.25	1.30	1.48	1.48	1.48
		CUMULATIVE AREA = .12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .82

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
503.	12.25	(CFS)	87.	28.	28.	28.
		(INCHES)	6.504	8.252	8.252	8.252
		(AC-FT)	43.	55.	55.	55.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
5.	12.25	1.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
8.57	12.25	1.53	1.69	1.69	1.69
		CUMULATIVE AREA = .12 SQ MI			

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .92

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
561.	12.25	(CFS)	98.	32.	32.	32.
		(IN PER)	7.279	9.524	9.524	9.524
		(AC-FT)	49.	63.	63.	63.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
5.	12.25	1.	1.	1.	1.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR

```
 (FEET)      (HR)
   9.23      12.25                    2.66        1.67        1.67        1.67

                        CUMULATIVE AREA =      .12 SQ MI

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

                        HYDROGRAPH AT STATION      POND
                          FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR       72-HR      24.00-HR
+  (CFS)       (HR)
                                      (CFS)
+    647.     12.17                     108.         35.         35.         35.
                                   (INCHES)       0.062      10.466      10.466      10.466
                                   (AC-FT)         53.         69.         69.         69.

 PEAK STORAGE  TIME                              MAXIMUM AVERAGE STORAGE
                                        6-HR        24-HR       72-HR      24.00-HR
+  (AC-FT)     (HR)
       6.     12.17                      1.          1.          1.          1.

 PEAK STAGE    TIME                              MAXIMUM AVERAGE STAGE
                                        6-HR        24-HR       72-HR      24.00-HR
+   (FEET)     (HR)
    9.77      12.17                     2.76        1.72        1.72        1.72

                        CUMULATIVE AREA =      .12 SQ MI
```

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

          ..............
          .            .
 58 KK    *     E3     *
          .            .
          ..............

                        RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 62 IN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
                JXDATE      1   0  STARTING DATE
                JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

 69 BA        SUBBASIN CHARACTERISTICS
                TAREA         .12  SUBBASIN AREA

              PRECIPITATION DATA

 64 PB          STORM       11.90  BASIN TOTAL PRECIPITATION

 65 PI        INCREMENTAL PRECIPITATION PATTERN
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00     .00     .00
.00     .00     .00     .00     .00     .00     .00     .00
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60 LS          SCS LOSS RATE
                STRTL        .30  INITIAL ABSTRACTION
               CRVNBR      86.90  CURVE NUMBER
               RTIMP        .00  PERCENT IMPERVIOUS AREA

61 UD          SCS DIMENSIONLESS UNITGRAPH
                TLAG        .19  LAG
```

```
                                          UNIT HYDROGRAPH
                                       13 END-OF-PERIOD ORDINATES
        67.     215.     254.     189.     100.      57.      32.      16.      10.       5.
         3.       2.       1.

  TOTAL RAINFALL =  11.30, TOTAL LOSS =   1.44, TOTAL EXCESS =  10.24

 PEAK FLOW    TIME                        MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+    776.    12.08           104.         34.        34.         34.
                          (INCHES)      7.875     10.237     10.237      10.237
                          (AC-FT)        52.        67.        67.         67.

                          CUMULATIVE AREA =     .12 SQ MI
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...          ...          ...          ...          ...
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                          HYDROGRAPH AT STATION        E3
                            FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =   4.60, TOTAL LOSS =   1.44, TOTAL EXCESS =   3.44

 PEAK FLOW    TIME                        MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+    276.    12.08            36.         11.        11.         11.
                          (INCHES)      2.742      3.433      3.433       3.433
                          (AC-FT)        18.        23.        23.         23.

                          CUMULATIVE AREA =     .12 SQ MI
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...          ...          ...          ...          ...
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                          HYDROGRAPH AT STATION        E3
                            FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.57, TOTAL LOSS =   1.44, TOTAL EXCESS =   6.13

 PEAK FLOW    TIME                        MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+    498.    12.08            66.         21.        21.         21.
                          (INCHES)      4.501      6.394      6.394       6.394
                          (AC-FT)        31.        42.        42.         42.

                          CUMULATIVE AREA =     .12 SQ MI
```

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...          ...          ...          ...          ...
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                          HYDROGRAPH AT STATION        E3
                            FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.24, TOTAL LOSS =   1.44, TOTAL EXCESS =   7.80

 PEAK FLOW    TIME                        MAXIMUM AVERAGE FLOW
                              6-HR       24-HR      72-HR     24.00-HR
```

```
-   (CFS)       (HR)
                          (CFS)
+    625.      12.08                93.          27.          27.          27.
                         (INCHES)    6.309       8.134        8.134        8.134
                          (AC-FT)    41.          53.          53.          53.

                         CUMULATIVE AREA =      .12 SQ MI

     ...          ...          ...          ...          ...

                         HYDROGRAPH AT STATION        E3
                           FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.62, TOTAL EXCESS =    9.33

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    509.      12.00                95.          31.          31.          31.
                         (INCHES)    7.180       9.301        9.301        9.301
                          (AC-FT)    47.          61.          61.          61.

                         CUMULATIVE AREA =      .12 SQ MI

     ...          ...          ...          ...          ...

                         HYDROGRAPH AT STATION        E3
                           FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.30, TOTAL LOSS =    1.64, TOTAL EXCESS =   10.26

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    776.      12.08               106.          34.          34.          34.
                         (INCHES)    7.875      10.237       10.237       10.237
                          (AC-FT)    52.          67.          67.          67.

                         CUMULATIVE AREA =      .12 SQ MI


... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...


            ............
            .          .
  75 HR     .   COMB   .
            .          .
            ............

  28 HR          HYDROGRAPH COMBINATION
                      COMB          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ...

     ...          ...          ...          ...          ...

                         HYDROGRAPH AT STATION      COMB
                           FOR PLAN 1, RATIO =  .41

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
  (CFS)       (HR)
                          (CFS)
    694.      12.08                75.          23.          23.          23.
                         (INCHES)    2.694       3.514        3.514        3.514
                          (AC-FT)    37.          46.          46.          46.

                         CUMULATIVE AREA =      .25 SQ MI

     ...          ...          ...          ...          ...

                         HYDROGRAPH AT STATION      COMB
                           FOR PLAN 1, RATIO =  .67
```

```
 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+    846.      12.08                  135.          43.          43.          43.
                        (INCHES)     5.101        6.497        6.497        6.497
                        (AC-FT)        47.          86.          86.          86.

                       CUMULATIVE AREA =      .25 SQ MI

     ...          ...          ...          ...          ...

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .82

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.00-HR
+   (CFS)       (HR)
                          (CFS)
+   1076.      12.08                  170.          55.          55.          55.
                        (INCHES)     6.407        8.244        8.244        8.244
                        (AC-FT)        64.         109.         109.         109.

                       CUMULATIVE AREA =      .25 SQ MI

     ...          ...          ...          ...          ...

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO =  .93

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.17-HR
+   (CFS)       (HR)
                          (CFS)
+   1281.      12.17                  191.          62.          62.          62.
                        (INCHES)     7.275        9.414        9.414        9.414
                        (AC-FT)        76.         124.         124.         124.

                       CUMULATIVE AREA =      .25 SQ MI

     ...          ...          ...          ...          ...

                       HYDROGRAPH AT STATION     COMB
                         FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR     24.17-HR
+   (CFS)       (HR)
                          (CFS)
+   1308.      12.17                  212.          69.          69.          69.
                        (INCHES)     7.909       10.352       10.352       10.352
                        (AC-FT)        83.         136.         136.         136.

                       CUMULATIVE AREA =      .25 SQ MI
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          ..............
          .            .
 77 KK    .     PIC    .
          .            .
          ..............
                          PIPEST COMPUTATION 100-YRS STORM IN PROJECT AREA

 81 IN        TIME DATA FOR INPUT TIME SERIES
                 TAMIN          5.  TIME INTERVAL IN MINUTES
                 IXDATE     1    1  STARTING DATE
                 IXTIME          1  STARTING TIME

            SUBBASIN HYDROLOGIC DATA

 78 BA        SUBBASIN CHARACTERISTICS
                 TAREA        .25  SUBBASIN AREA
```

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                PRECIPITATION DATA

83 PB                STORM        11.30  BASIN TOTAL PRECIPITATION

84 PI              INCREMENTAL PRECIPITATION PATTERN
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                     .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                     .00       .00       .00       .00       .00       .00       .00       .01       .00       .01
                     .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                     .03       .09       .09       .09       .01       .01       .01       .01       .01       .01
                     .01       .01       .01       .01       .01       .01       .01       .00       .00       .00
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79 LS            SCS LOSS RATE
                      STRTL          .32  INITIAL ABSTRACTION
                     CRVNBR        86.00  CURVE NUMBER
                      PTIMP          .00  PERCENT IMPERVIOUS AREA

80 UD            SCS DIMENSIONLESS UNITGRAPH
                       TLAG          .35  LAG

                                                    ...

                                                UNIT HYDROGRAPH
                                            23 END-OF-PERIOD ORDINATES
                 1.        4.        9.       12.       12.       11.        9.        6.        4.        3.
                 2.        1.        1.        1.        1.        0.        0.        0.        0.        0.
                 0.        0.        0.

   TOTAL RAINFALL =   11.30, TOTAL LOSS =    1.75, TOTAL EXCESS =   10.15

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                              (CFS)
-     47.      12.25                 8.          3.          3.          3.
                            (INCHES)       7.806      10.093      10.093      10.093
                             (AC-FT)          4.          5.          5.          5.

                            CUMULATIVE AREA =      .01 SQ MI

   ...              ...              ...              ...              ...

                          HYDROGRAPH AT STATION       P1c
                            FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.68, TOTAL LOSS =    1.52, TOTAL EXCESS =    3.35

 PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
-  (CFS)       (HR)
                              (CFS)
-     16.      12.25                 3.          1.          1.          1.
                            (INCHES)       2.477       3.333       3.333       3.333
                             (AC-FT)          1.          2.          2.          2.

                            CUMULATIVE AREA =      .01 SQ MI
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...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P1c
                      FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.47, TOTAL LOSS =    1.67, TOTAL EXCESS =    5.81

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
 +  (CFS)      (HR)
                    (CFS)
 +    30.     12.25                 3.           2.           2.           2.
                   (INCHES)      4.932        6.269        6.269        6.269
                   (AC-FT)          3.           3.           3.           3.

                   CUMULATIVE AREA =      .01 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P1c
                      FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.71, TOTAL EXCESS =    8.04

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
 +  (CFS)      (HR)
                    (CFS)
 +    38.     12.25                 3.           2.           2.           2.
                   (INCHES)      6.259        8.000        8.000        8.000
                   (AC-FT)          4.           4.           4.           4.

                   CUMULATIVE AREA =      .01 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P1c
                      FOR PLAN 1, RATIO =  .92

  TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.74, TOTAL EXCESS =    9.21

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
 +  (CFS)      (HR)
                    (CFS)
 +    43.     12.25                 3.           2.           2.           2.
                   (INCHES)      7.110        9.161        9.161        9.161
                   (AC-FT)          4.           5.           5.           5.

                   CUMULATIVE AREA =      .01 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      P1c
                      FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.75, TOTAL EXCESS =   10.15

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR        24-HR        72-HR     24.00-HR
 +  (CFS)      (HR)
                    (CFS)
 +    47.     12.25                 3.           3.           3.           3.
                   (INCHES)      7.806       10.083       10.083       10.083
                   (AC-FT)          4.           5.           5.           5.

                   CUMULATIVE AREA =      .01 SQ MI

... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

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94 KK      *        P14  *
           *             *
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RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

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98 IN          TIME DATA FOR INPUT TIME SERIES
                   JXMIN           15  TIME INTERVAL IN MINUTES
                  JXDATE       1    [illegible]  STARTING DATE
                  JXTIME            [illegible]  STARTING TIME

             SUBBASIN RUNOFF DATA

95 BA          SUBBASIN CHARACTERISTICS
                   TAREA          .[illegible]  SUBBASIN AREA

               PRECIPITATION DATA

100 PB             STORM        11.[illegible]  BASIN TOTAL PRECIPITATION

101 PI           INCREMENTAL PRECIPITATION PATTERN
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.07	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00		

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96 LS          SCS LOSS RATE
                   STRTL          .[illegible]  INITIAL ABSTRACTION
                  CRVNBR     [illegible]  CURVE NUMBER
                   RTIMP          .[illegible]  PERCENT IMPERVIOUS AREA

97 UD          SCS DIMENSIONLESS UNITGRAPH
                    TLAG          .[illegible]  LAG
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                                          UNIT HYDROGRAPH
                                       [illegible] END-OF-PERIOD ORDINATES
            59.        1[illegible].        [illegible].         1.          0.

   TOTAL RAINFALL =   11.[illegible], TOTAL LOSS =    1.[illegible], TOTAL EXCESS =    9.[illegible]

PEAK FLOW     TIME                             MAXIMUM AVERAGE FLOW
                                    [illegible]-HR        24-HR        72-HR       24.00-HR
 (CFS)        (HR)
                          (CFS)
   [illegible].      12.00                       [illegible].          3.          [illegible].          3.
                        (INCHES)      [illegible]       9.971        9.971        9.971
                        (AC-FT)          [illegible].          5.           5.           5.

                    CUMULATIVE AREA =      .[illegible] SQ MI
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              HYDROGRAPH AT STATION      P14
               FOR PLAN 1, RATIO =  .[illegible]
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    TOTAL RAINFALL =   4.88, TOTAL LOSS =    1.65, TOTAL EXCESS =    3.23

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     29.        12.00              3.           1.           1.           1.
                                (INCHES)       2.589        3.225        3.225        3.225
                                 (AC-FT)         1.           2.           2.           2.

                              CUMULATIVE AREA =     .01 SQ MI

      ...                 ...            ...          ...          ...

                              HYDROGRAPH AT STATION      P14
                                FOR PLAN 1, RATIO =  .67

    TOTAL RAINFALL =   7.37, TOTAL LOSS =    1.82, TOTAL EXCESS =    6.15

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     53.        12.00              5.           2.           2.           2.
                                (INCHES)       4.836        6.148        6.148        6.148
-                                (AC-FT)         1.           3.           3.           3.

                              CUMULATIVE AREA =     .01 SQ MI

      ...                 ...            ...          ...          ...

                              HYDROGRAPH AT STATION      P14
                                FOR PLAN 1, RATIO =  .82

    TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.88, TOTAL EXCESS =    7.88

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     67.        12.00              7.           2.           2.           2.
                                (INCHES)       6.142        7.876        7.876        7.876
                                 (AC-FT)         3.           4.           4.           4.

                              CUMULATIVE AREA =     .01 SQ MI

      ...                 ...            ...          ...          ...

                              HYDROGRAPH AT STATION      P14
                                FOR PLAN 1, RATIO =  .92

    TOTAL RAINFALL =  10.95, TOTAL LOSS =    1.90, TOTAL EXCESS =    9.04

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     76.        12.00              8.           3.           3.           3.
                                (INCHES)       7.018        9.038        9.038        9.038
                                 (AC-FT)         4.           5.           5.           5.

                              CUMULATIVE AREA =     .01 SQ MI

      ...                 ...            ...          ...          ...

                              HYDROGRAPH AT STATION      P14
                                FOR PLAN 1, RATIO = 1.00

    TOTAL RAINFALL =  11.84, TOTAL LOSS =    1.92, TOTAL EXCESS =    9.92

  PEAK FLOW      TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                                  (CFS)
+     83.        12.00              8.           3.           3.           3.
                                (INCHES)       7.714        9.971        9.971        9.971
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(AC-FT) 4. 5. 5. 5.

CUMULATIVE AREA = .01 SQ MI

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             ***************
             *             *
111 KK       *      E1     *
             *             *
             ***************

                              RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

115 IN          TIME DATA FOR INPUT TIME SERIES
                     JXMIN          15  TIME INTERVAL IN MINUTES
                    JXDATE      1    0  STARTING DATE
                    JXTIME           0  STARTING TIME

               SUBBASIN RUNOFF DATA

112 BA          SUBBASIN CHARACTERISTICS
                     TAREA         .49  SUBBASIN AREA

                PRECIPITATION DATA

117 PB               STORM       11.90  BASIN TOTAL PRECIPITATION

118 PI            INCREMENTAL PRECIPITATION PATTERN
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.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

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113 LS          SCS LOSS RATE
                     STRTL         .33  INITIAL ABSTRACTION
                    CRVNBR       85.70  CURVE NUMBER
                     RTIMP         .00  PERCENT IMPERVIOUS AREA

114 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG         .40  LAG

                                            ***

                                      UNIT HYDROGRAPH
                                  26 END-OF-PERIOD ORDINATES
      49.      151.      317.      469.      535.      517.      449.      356.      246.      180.
     135.      100.       73.       54.       39.       29.       21.       16.       12.        8.
       6.        5.        4.        3.        2.        1.

   TOTAL RAINFALL =    11.90, TOTAL LOSS =    1.79, TOTAL EXCESS =    10.11

PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
```

PEAK FLOW (CFS)	TIME (HR)		6-HR	24-HR	72-HR	24.00-HR
3109.	12.25	(CFS)	400.	132.	132.	132.
		(INCHES)	7.783	10.045	10.045	10.045
		(AC-FT)	202.	261.	261.	261.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = 1.55, TOTAL EXCESS = 3.32

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
721.	12.25	(CFS)	139.	43.	43.	43.
		(INCHES)	2.655	3.300	3.300	3.300
		(AC-FT)	69.	86.	86.	86.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .67

TOTAL RAINFALL = 7.99, TOTAL LOSS = 1.70, TOTAL EXCESS = 6.29

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1336.	12.25	(CFS)	257.	82.	82.	82.
		(INCHES)	4.909	6.228	6.228	6.228
		(AC-FT)	127.	162.	162.	162.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .82

TOTAL RAINFALL = 9.76, TOTAL LOSS = 1.75, TOTAL EXCESS = 8.01

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1669.	12.25	(CFS)	325.	104.	104.	104.
		(INCHES)	6.215	7.955	7.955	7.955
		(AC-FT)	161.	207.	207.	207.

CUMULATIVE AREA = .49 SQ MI

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

HYDROGRAPH AT STATION E1
FOR PLAN 1, RATIO = .92

TOTAL RAINFALL = 10.95, TOTAL LOSS = 1.78, TOTAL EXCESS = 9.17

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1922.	12.25	(CFS)	371.	119.	119.	119.
		(INCHES)	7.086	9.114	9.114	9.114
		(AC-FT)	184.	237.	237.	237.

CUMULATIVE AREA = .49 SQ MI

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

                HYDROGRAPH AT STATION        E1
                  FOR PLAN 1, RATIO = 1.00

  TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.79, TOTAL EXCESS =   10.11

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                              (CFS)
+   2109.      12.25                408.         132.         132.         132.
                          (INCHES)  7.783       10.045       10.045       10.045
                           (AC-FT)   202.        261.         261.         261.

                        CUMULATIVE AREA =      .49 SQ MI


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


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 128 KK     .     E2    .
            .           .
            .............
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 132 IN       TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
               JXDATE      1   0  STARTING DATE
               JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

 133 BA       SUBBASIN CHARACTERISTICS
                TAREA        .28  SUBBASIN AREA

              PRECIPITATION DATA

 134 PB          STORM      11.90  BASIN TOTAL PRECIPITATION

 135 PI         INCREMENTAL PRECIPITATION PATTERN
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                  .01       .01       .01       .01       .01       .01       .01       .01       .03       .03
                  .09       .09       .09       .09       .01       .01       .01       .01       .01       .01
                  .01       .01       .01       .01       .01       .01       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                  .00       .00       .00       .00       .00       .00       .00       .00

 130 LS       SCS LOSS RATE
                STRTL        .20  INITIAL ABSTRACTION
               CRVNBR      87.00  CURVE NUMBER
                RTIMP        .00  PERCENT IMPERVIOUS AREA
```

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131 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        .24  LAG

                                                    UNIT HYDROGRAPH
                                                 16 END-OF-PERIOD ORDINATES
          93.     288.     439.     420.     313.     182.     114.     70.     44.     27.
          17.      10.       6.       4.       3.       1.

  TOTAL RAINFALL =   11.98, TOTAL LOSS =   1.62, TOTAL EXCESS =   10.28

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+  1461.      12.08                221.         72.         72.         72.
                        (INCHES)   7.882      10.242      10.242      10.242
                        (AC-FT)    110.        142.        142.        142.

                        CUMULATIVE AREA =    .26 SQ MI

  ...          ...          ...          ...          ...

                        HYDROGRAPH AT STATION       E2
                          FOR PLAN 1, RATIO =  .41

  TOTAL RAINFALL =   4.88, TOTAL LOSS =   1.43, TOTAL EXCESS =   3.45

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   514.      12.17                 77.         24.         24.         24.
                        (INCHES)   2.748       3.440       3.440       3.440
                        (AC-FT)     38.         48.         48.         48.

                        CUMULATIVE AREA =    .26 SQ MI

  ...          ...          ...          ...          ...

                        HYDROGRAPH AT STATION       E2
                          FOR PLAN 1, RATIO =  .67

  TOTAL RAINFALL =   7.97, TOTAL LOSS =   1.55, TOTAL EXCESS =   6.42

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   934.      12.08                140.         45.         45.         45.
                        (INCHES)   5.008       6.400       6.400       6.400
                        (AC-FT)     70.         89.         89.         89.

                        CUMULATIVE AREA =    .26 SQ MI

  ...          ...          ...          ...          ...

                        HYDROGRAPH AT STATION       E2
                          FOR PLAN 1, RATIO =  .82

  TOTAL RAINFALL =   9.70, TOTAL LOSS =   1.59, TOTAL EXCESS =   8.17

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+  1175.      12.08                177.         57.         57.         57.
                        (INCHES)   6.316       8.140       8.140       8.140
                        (AC-FT)     88.        113.        113.        113.

                        CUMULATIVE AREA =    .26 SQ MI

  ...          ...          ...          ...          ...

                        HYDROGRAPH AT STATION       E2
                          FOR PLAN 1, RATIO =  .92
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```
TOTAL RAINFALL =  10.95, TOTAL LOSS =   1.61, TOTAL EXCESS =   9.34

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+   1374.     12.08                202.         65.         65.         65.
                         (INCHES)  7.196      9.306       9.306       9.306
                          (AC-FT)  100.        129.        129.        129.

                       CUMULATIVE AREA =     .26 SQ MI

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

                    HYDROGRAPH AT STATION      E2
                     FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL =  11.90, TOTAL LOSS =   1.62, TOTAL EXCESS =  10.28

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
-   1461.     12.08                221.         72.         72.         72.
                         (INCHES)  7.882     10.242      10.242      10.242
                          (AC-FT)  110.        142.        142.        142.

                       CUMULATIVE AREA =     .26 SQ MI


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


              ************
              *          *
145 KK        *   COMB   *
              *          *
              ************

146 HC          HYDROGRAPH COMBINATION
                   ICOMP          6  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                  ***

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .41

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+   1795.     12.17                222.        100.        100.        100.
                         (INCHES)  3.750      3.417       3.417       3.417
                          (AC-FT)  160.        198.        198.        198.

                       CUMULATIVE AREA =    1.09 SQ MI

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

                    HYDROGRAPH AT STATION     COMB
                     FOR PLAN 1, RATIO =  .67

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)      (HR)
                            (CFS)
+   3192.     12.17                386.        186.        186.        186.
                         (INCHES)  5.007      6.373       6.373       6.373
                          (AC-FT)  274.        370.        370.        370.

                       CUMULATIVE AREA =    1.09 SQ MI

  ***          ***          ***          ***          ***
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                          HYDROGRAPH AT STATION     COMB
                           FOR PLAN 1, RATIO =  .82

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                             (CFS)
+    3986.      12.17                    739.         237.         237.         237.
                          (INCHES)      6.312        8.110        8.110        8.110
                           (AC-FT)       366.         471.         471.         471.

                          CUMULATIVE AREA =     1.09 SQ MI

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

                          HYDROGRAPH AT STATION     COMB
                           FOR PLAN 1, RATIO =  .92

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                             (CFS)
+    4608.      12.17                    841.         271.         271.         271.
                          (INCHES)      7.182        9.275        9.275        9.275
                           (AC-FT)       417.         538.         538.         538.

                          CUMULATIVE AREA =     1.09 SQ MI

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

                          HYDROGRAPH AT STATION     COMB
                           FOR PLAN 1, RATIO = 1.00

  PEAK FLOW      TIME                            MAXIMUM AVERAGE FLOW
                                         6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                             (CFS)
+    5088.      12.17                    922.         299.         299.         299.
                          (INCHES)      7.877       10.210       10.210       10.210
                           (AC-FT)       457.         593.         593.         593.

                          CUMULATIVE AREA =     1.09 SQ MI


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

              ***************
              *             *
147 KK        *      P4a    *
              *             *
              ***************
                                 RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

151 IN           TIME DATA FOR INPUT TIME SERIES
                      JXMIN           15   TIME INTERVAL IN MINUTES
                      JXDATE      1    0   STARTING DATE
                      JXTIME           0   STARTING TIME

                 SUBBASIN RUNOFF DATA

148 BA           SUBBASIN CHARACTERISTICS
                      TAREA          .03   SUBBASIN AREA

                 PRECIPITATION DATA

153 PB                STORM        11.40   BASIN TOTAL PRECIPITATION

154 PI             INCREMENTAL PRECIPITATION PATTERN
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                      .00       .00       .00       .00       .00       .00       .00       .00  [illegible] [illegible]
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

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149 LS          SCS LOSS RATE
                     STRTL        .24  INITIAL ABSTRACTION
                    CRVNBR      89.40  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

150 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        .13  LAG
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...

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                                                    UNIT HYDROGRAPH
                                                 10 END-OF-PERIOD ORDINATES
                 36.      62.      98.     [illegible]     11.      5.      2.      1.      1.      0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.31, TOTAL EXCESS =   10.59

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)     (HR)
                          (CFS)
+    200.    12.00                 24.          8.          9.          9.
                         (INCHES)  8.045      10.568      10.568      10.568
                          (AC-FT)   12.         16.         16.         16.

                        CUMULATIVE AREA =    .03 SQ MI
```

... ...

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                        HYDROGRAPH AT STATION      [illegible]
                          FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.[illegible], TOTAL LOSS =    1.16, TOTAL EXCESS =    3.70

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)     (HR)
                          (CFS)
+     74.    12.00                  9.          3.          3.          3.
                         (INCHES)  2.415      3.690       3.690       3.690
                          (AC-FT)   4.         6.          6.          6.

                        CUMULATIVE AREA =    .02 SQ MI
```

... ...

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                        HYDROGRAPH AT STATION      [illegible]
                          FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    [illegible], TOTAL LOSS =    1.27, TOTAL EXCESS =    6.71

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+   (CFS)     (HR)
                          (CFS)
+    130.    12.00                 [illegible]  5.          5.          5.
                         (INCHES)  5.181      6.696       6.696       6.696
```

```
                    (AC-FT)        8.        10.        10.        10.

                    CUMULATIVE AREA =     .03 SQ MI

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

                    HYDROGRAPH AT STATION      P4a
                      FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =   9.76, TOTAL LOSS =    1.29, TOTAL EXCESS =    8.47

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     162.     12.00                 20.         6.          6.          5.
                              (INCHES)      6.486       8.452       8.452       8.452
                               (AC-FT)        10.         13.         13.         13.

                    CUMULATIVE AREA =     .03 SQ MI

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

                    HYDROGRAPH AT STATION      P4a
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =  10.85, TOTAL LOSS =    1.30, TOTAL EXCESS =    9.64

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     183.     12.00                 22.         7.          7.          7.
                              (INCHES)      7.353       9.627       9.627       9.627
                               (AC-FT)        11.         14.         14.         14.

                    CUMULATIVE AREA =     .03 SQ MI

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

                    HYDROGRAPH AT STATION      P4a
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =  11.90, TOTAL LOSS =    1.31, TOTAL EXCESS =   10.59

  PEAK FLOW     TIME                        MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.00-HR
+   (CFS)       (HR)
                                  (CFS)
+     200.     12.00                 24.         8.          8.          8.
                              (INCHES)      8.045      10.568      10.568      10.568
                               (AC-FT)        12.         16.         16.         16.

                    CUMULATIVE AREA =     .03 SQ MI

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

            *************
            *           *
164 KK      *     P4b   *
            *           *
            *************
                          RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

168 IN        TIME DATA FOR INPUT TIME SERIES
                    JXMIN          15  TIME INTERVAL IN MINUTES
                  JXDATE       1    0  STARTING DATE
                  JXTIME            0  STARTING TIME

            SUBBASIN RUNOFF DATA

165 BA        SUBBASIN CHARACTERISTICS
                   TAREA         .03  SUBBASIN AREA
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PRECIPITATION DATA

170 PB STORM 11.90 BASIN TOTAL PRECIPITATION

171 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.01	.00	.01
.01	.01	.01	.01	.01	.01	.01	.01	.03	.03
.03	.09	.09	.09	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00		

166 LS SCS LOSS RATE

STRTL	.15	INITIAL ABSTRACTION
CRVNBR	93.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

167 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.47	LAG

***

UNIT HYDROGRAPH
30 END-OF-PERIOD ORDINATES

6.	19.	39.	64.	81.	87.	84.	74.	62.	46.
34.	26.	21.	16.	12.	9.	7.	5.	4.	3.
2.	2.	1.	1.	1.	1.	1.	0.	0.	0.

TOTAL RAINFALL = 11.90, TOTAL LOSS = .86, TOTAL EXCESS = 11.04

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 380.	12.33		91.	27.	27.	27.
		(INCHES)	8.239	10.965	10.965	10.965
		(AC-FT)	40.	54.	54.	54.

CUMULATIVE AREA = .09 SQ MI

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

HYDROGRAPH AT STATION P4b
FOR PLAN 1, RATIO = .41

TOTAL RAINFALL = 4.88, TOTAL LOSS = .80, TOTAL EXCESS = 4.08

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 147.	12.33		31.	10.	10.	10.
		(INCHES)	2.112	4.048	4.048	4.048
		(AC-FT)	15.	20.	20.	20.

CUMULATIVE AREA = .09 SQ MI

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...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      F4b
                     FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =     .84, TOTAL EXCESS =    7.14

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
 -  (CFS)      (HR)
                              (CFS)
 +    250.    12.33                 53.          17.          17.          17.
                            (INCHES)       5.405        7.085        7.085        7.085
                             (AC-FT)        26.          35.          35.          35.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      F4b
                     FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =     .85, TOTAL EXCESS =    8.91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
 +  (CFS)      (HR)
                              (CFS)
 -    305.    12.33                 66.          22.          22.          22.
                            (INCHES)       6.696        8.847        8.847        8.847
                             (AC-FT)        33.          43.          43.          43.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      F4b
                     FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =     .85, TOTAL EXCESS =   10.09

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
 -  (CFS)      (HR)
                              (CFS)
 +    349.    12.33                 75.          25.          25.          25.
                            (INCHES)       7.554       10.023       10.023       10.023
                             (AC-FT)        37.          49.          49.          49.

                     CUMULATIVE AREA =     .09 SQ MI

...          ...          ...          ...          ...

                    HYDROGRAPH AT STATION      F4b
                     FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR        24-HR        72-HR     24.00-HR
 -  (CFS)      (HR)
                              (CFS)
 -    380.    12.33                 81.          27.          27.          27.
                            (INCHES)       8.229       10.965       10.965       10.965
                             (AC-FT)        40.          54.          54.          54.

                     CUMULATIVE AREA =     .09 SQ MI

... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ... ...

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            .            .
 181 MN     .    FLOW    .          ::
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RUNOFF MITIGATION POND CALCULATION

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183 KO        OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          1  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

184 RS        STORAGE ROUTING
                    NSTTS          1  NUMBER OF SUBREACHES
                     ITYP       ELEV  TYPE OF INITIAL CONDITION
                   RSVRIC        .00  INITIAL CONDITION
                        X        .00  WORKING R AND D COEFFICIENT

186 SV          STORAGE          .0      1.4      2.9      4.5      6.2      8.1     10.0     12.1     14.3     16.6

187 SE       -- ELEVATION       .00     1.64     3.28     4.92     6.56     8.20     9.84    11.48    13.12    14.76

185 SQ          DISCHARGE        1.      13.      46.      64.      78.     121.     433.     833.    1002.    1427.
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... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .41

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 74.	12.83		30.	10.	10.	10.
		(INCHES)	3.084	3.970	3.970	3.970
		(AC-FT)	19.	19.	19.	19.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.00-HR
+ (AC-FT)	(HR)					
6.	12.83		2.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.00-HR
+ (FEET)	(HR)					
6.11	12.83		2.47	.94	.94	.94

CUMULATIVE AREA = .09 SQ MI

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .67

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 188.	12.50		53.	17.	17.	17.
		(INCHES)	5.041	6.956	6.956	6.956
		(AC-FT)	26.	34.	34.	34.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.00-HR
+ (AC-FT)	(HR)					
9.	12.50		4.	1.	1.	1.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.00-HR
+ (FEET)	(HR)					
8.69	12.50		3.91	1.48	1.48	1.48

CUMULATIVE AREA = .09 SQ MI

... ...

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .82

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
261.	12.50	(CFS)	66.	21.	21.	21.
		(INCHES)	6.689	8.689	8.689	8.689
		(AC-FT)	33.	43.	43.	43.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
9.	12.50	4.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.27	12.50	4.32	1.71	1.71	1.71

CUMULATIVE AREA = .09 SQ MI

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

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = .92

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
308.	12.50	(CFS)	74.	24.	24.	24.
		(INCHES)	7.508	9.847	9.847	9.847
		(AC-FT)	37.	48.	48.	48.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
10.	12.50	4.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.64	12.50	4.57	1.85	1.85	1.85

CUMULATIVE AREA = .09 SQ MI

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

HYDROGRAPH AT STATION POND
FOR PLAN 1, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
343.	12.50	(CFS)	81.	27.	27.	27.
		(INCHES)	8.190	10.774	10.774	10.774
		(AC-FT)	40.	53.	53.	53.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
10.	12.50	4.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.89	12.50	4.75	1.96	1.96	1.96

CUMULATIVE AREA = .09 SQ MI

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                ************
                *          *
1[illegible] PR *    P4c   *
                *          *
                ************

                    RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

191 TN        TIME DATA FOR INPUT TIME SERIES
                JXMIN          15  TIME INTERVAL IN MINUTES
                JXDATE      1   0  STARTING DATE
                JXTIME          0  STARTING TIME

            SUBBASIN RUNOFF DATA

189 BA        SUBBASIN CHARACTERISTICS
                TAREA         .05  SUBBASIN AREA

              PRECIPITATION DATA

194 [illegible]   STORM       11.90  BASIN TOTAL PRECIPITATION

19[illegible]   INCREMENTAL PRECIPITATION PATTERN
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .01      .00      .01
                .01      .01      .01      .01      .01      .01      .01      .01      .01      .01
                .03      .03      .05      .05      .01      .01      .01      .01      .01      .01
                .01      .01      .01      .01      .01      .01      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
                .00      .00      .00      .00      .00      .00      .00      .00

1[illegible]  SCS LOSS RATE
                SCSTI          .15  INITIAL ABSTRACTION
                CRVNBR       93.20  CURVE NUMBER
                RTIMP          .00  PERCENT IMPERVIOUS AREA

191 UD        SCS DIMENSIONLESS HYDROGRAPH
                TLAG           .15  LAG

                                          ...

                                          UNIT HYDROGRAPH
                                       [illegible] END-OF-PERIOD ORDINATES
                 6.      [illegible]     42.      56.      59.      51.      40.      27.      19.      14.
                10.       7.       5.       3.       2.       2.       1.       1.       1.       0.
                 0.       0.       0.

   TOTAL RAINFALL =   11.[illegible], TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   -HR        24-HR        72-HR      [illegible]-HR
+  (CFS)      (HR)
                         (CFS)
+   228.     12.25                 12.          24.          24.          24.
                         (INCHES)   [illegible]   10.987      10.987      10.987
                         (AC-FT)    [illegible].      28.          28.          28.

                         CUMULATIVE AREA =     .05 SQ MI
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***          ***          ***          ***          ***

                    HYDROGRAPH AT STATION      P4c
                     FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =     .80, TOTAL EXCESS =    4.08

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+     88.      12.25                 16.          5.          5.          5.
                         (INCHES)  3.154       4.057       4.057       4.057
                         (AC-FT)     9.          10.         10.         10.

                         CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION      P4c
                     FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =     .84, TOTAL EXCESS =    7.14

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    150.      12.25                 27.          9.          9.          9.
                         (INCHES)  5.408       7.099       7.099       7.099
                         (AC-FT)    14.          18.         18.         18.

                         CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION      P4c
                     FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.78, TOTAL LOSS =     .85, TOTAL EXCESS =    8.91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    186.      12.25                 34.         11.         11.         11.
                         (INCHES)  6.664       8.864       8.864       8.864
                         (AC-FT)    17.          22.         22.         22.

                         CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION      P4c
                     FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =     .85, TOTAL EXCESS =   10.09

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                   6-HR       24-HR       72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
    209.      12.25                 38.         13.         13.         13.
                         (INCHES)  7.598      10.043      10.043      10.043
                         (AC-FT)    19.          25.         25.         25.

                         CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION      P4c
                     FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =     .86, TOTAL EXCESS =   11.04

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
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                                          6-HR        24-HR        72-HR     24.00-HR
+    (CFS)        (HR)
                              (CFS)
+      228.       12.25                    42.          14.          14.          14.
                            (INCHES)     8.243       10.987       10.987       10.987
                             (AC-FT)       21.          28.          28.          28.

                              CUMULATIVE AREA =       .05 SQ MI


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

              **************
              *            *
205 KK        *    COMB    *
              *            *
              **************

206 HC           HYDROGRAPH COMBINATION
                    ICOMP            2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                                              ***

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

                              HYDROGRAPH AT STATION      COMB
                                FOR PLAN 1, RATIO =  .41

  PEAK FLOW       TIME                             MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
+    (CFS)        (HR)
                              (CFS)
+      140.       12.25                    46.          15.          15.          15.
                            (INCHES)     3.094        4.000        4.000        4.000
                             (AC-FT)       23.          30.          30.          30.

                              CUMULATIVE AREA =       .14 SQ MI

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

                              HYDROGRAPH AT STATION      COMB
                                FOR PLAN 1, RATIO =  .67

  PEAK FLOW       TIME                             MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
+    (CFS)        (HR)
                              (CFS)
+      262.       12.58                    80.          26.          26.          26.
                            (INCHES)     5.366        7.005        7.005        7.005
                             (AC-FT)       40.          52.          52.          52.

                              CUMULATIVE AREA =       .14 SQ MI

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

                              HYDROGRAPH AT STATION      COMB
                                FOR PLAN 1, RATIO =  .82

  PEAK FLOW       TIME                             MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
+    (CFS)        (HR)
                              (CFS)
+      377.       12.50                    99.          33.          33.          33.
                            (INCHES)     6.649        8.749        8.749        8.749
                             (AC-FT)       49.          65.          65.          65.

                              CUMULATIVE AREA =       .14 SQ MI

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

                              HYDROGRAPH AT STATION      COMB
                                FOR PLAN 1, RATIO =  .92

  PEAK FLOW       TIME                             MAXIMUM AVERAGE FLOW
                                          6-HR        24-HR        72-HR     24.00-HR
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+   (CFS)        (HR)
                          (CFS)
+     453.       12.42                  112.          37.          37.          37.
                         (INCHES)      7.508        9.913        9.913        9.913
                          (AC-FT)        56.          73.          73.          73.

                         CUMULATIVE AREA =      .14 SQ MI

     ***                 ...            ...            ...            ...

                          HYDROGRAPH AT STATION     COMB
                            FOR PLAN 1, RATIO = 1.00

 PEAK FLOW      TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR        24-HR        72-HR      24.00-HR
+   (CFS)        (HR)
                          (CFS)
+     505.       12.42                  122.          40.          40.          40.
                         (INCHES)      8.190       10.846       10.846       10.846
                          (AC-FT)        61.          80.          80.          80.

                         CUMULATIVE AREA =      .14 SQ MI
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                 ************
                 *          *
 207 KK          *    E4    *
                 *          *
                 ************
                                 RUNOFF COMPUTATION 100-YRS STORM IN PROJECT AREA

 211 IN            TIME DATA FOR INPUT TIME SERIES
                        JXMIN          15  TIME INTERVAL IN MINUTES
                       JXDATE       1    0  STARTING DATE
                       JXTIME            0  STARTING TIME

                  SUBBASIN RUNOFF DATA

 208 BA            SUBBASIN CHARACTERISTICS
                        TAREA         .05  SUBBASIN AREA

                   PRECIPITATION DATA

 213 PB                  STORM       11.00  BASIN TOTAL PRECIPITATION

 214 PI              INCREMENTAL PRECIPITATION PATTERN
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                       .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                       .01        .01        .01        .01        .01        .01        .01        .01        .03        .05
                       .05        .04        .04        .04        .01        .01        .01        .01        .01        .01
                       .01        .01        .01        .01        .01        .01        .00        .00        .00        .00
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209 LS          SCS LOSS RATE
                     STRTL        .36  INITIAL ABSTRACTION
                    CRVNBR      84.90  CURVE NUMBER
                     RTIMP        .00  PERCENT IMPERVIOUS AREA

210 UD          SCS DIMENSIONLESS UNITGRAPH
                      TLAG        .11  LAG

                                                   ***

                                                UNIT HYDROGRAPH
                                             9 END-OF-PERIOD ORDINATES
                92.      162.      84.      34.      14.       6.       2.       1.       0.

   TOTAL RAINFALL =   11.90, TOTAL LOSS =   1.90, TOTAL EXCESS =   10.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   370.      12.00                  42.        14.        14.        14.
                          (INCHES)  7.728      9.988      9.988      9.988
                          (AC-FT)    21.        27.        27.        27.

                          CUMULATIVE AREA =     .05 SQ MI

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

                     HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .41

   TOTAL RAINFALL =    4.88, TOTAL LOSS =   1.63, TOTAL EXCESS =    3.25

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   127.      12.00                  14.         4.         4.         4.
                          (INCHES)  2.603      3.241      3.241      3.241
                          (AC-FT)     7.         9.         9.         9.

                          CUMULATIVE AREA =     .05 SQ MI

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

                     HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .67

   TOTAL RAINFALL =    7.97, TOTAL LOSS =   1.80, TOTAL EXCESS =    6.19

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   235.      12.00                  27.         8.         8.         8.
                          (INCHES)  4.851      6.165      6.165      6.165
                          (AC-FT)    13.        17.        17.        17.

                          CUMULATIVE AREA =     .05 SQ MI

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

                     HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .82

   TOTAL RAINFALL =    9.76, TOTAL LOSS =   1.85, TOTAL EXCESS =    7.91

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR       24-HR      72-HR     24.00-HR
+  (CFS)       (HR)
                          (CFS)
+   297.      12.00                  34.        11.        11.        11.
                          (INCHES)  6.158      7.894      7.894      7.894
                          (AC-FT)    17.        22.        22.        22.

                          CUMULATIVE AREA =     .05 SQ MI
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***              ***              ***              ***              ***

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO =  .92

   TOTAL RAINFALL =   10.95, TOTAL LOSS =    1.88, TOTAL EXCESS =    9.07

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    338.     12.00                   39.          12.          12.          12.
                         (INCHES)   7.031        9.056        9.056        9.056
                         (AC-FT)     19.          25.          25.          25.

                         CUMULATIVE AREA =     .05 SQ MI

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

                    HYDROGRAPH AT STATION        E4
                      FOR PLAN 1, RATIO = 1.00

   TOTAL RAINFALL =   11.90, TOTAL LOSS =    1.90, TOTAL EXCESS =   10.00

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    370.     12.00                   42.          14.          14.          14.
                         (INCHES)   7.728        9.988        9.988        9.988
                         (AC-FT)     21.          27.          27.          27.

                         CUMULATIVE AREA =     .05 SQ MI


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


                 ************
                 *          *
224 KK           *   COME   *
                 *          *
                 ************

225 HC              HYDROGRAPH COMBINATION
                         ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                   ***

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

                    HYDROGRAPH AT STATION      COME
                      FOR PLAN 1, RATIO =  .41

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    289.     12.00                   69.          22.          22.          22.
                         (INCHES)   1.953        3.782        3.782        3.782
                         (AC-FT)     34.          44.          44.          44.

                         CUMULATIVE AREA =     .11 SQ MI

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

                    HYDROGRAPH AT STATION      COME
                      FOR PLAN 1, RATIO =  .67

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                     6-HR        24-HR        72-HR      24.00-HR
+  (CFS)       (HR)
                          (CFS)
+    513.     12.00                  122.          40.          40.          40.
                         (INCHES)   5.205        6.768        6.768        6.768
                         (AC-FT)     61.          79.          79.          79.
```

CUMULATIVE AREA = .22 SQ MI

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

HYDROGRAPH AT STATION COMB
FOR PLAN 1, RATIO = .82

PEAK FLOW- (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+		(CFS)				
+ 637.	12.00		153.	50.	50.	50.
		(INCHES)	6.506	8.510	8.510	8.510
		(AC-FT)	76.	99.	99.	99.

CUMULATIVE AREA = .22 SQ MI

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

HYDROGRAPH AT STATION COMB
FOR PLAN 1, RATIO = .92

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+		(CFS)				
+ 720.	12.00		173.	57.	57.	57.
		(INCHES)	7.368	9.675	9.675	9.675
		(AC-FT)	86.	113.	113.	113.

CUMULATIVE AREA = .22 SQ MI

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

HYDROGRAPH AT STATION COMB
FOR PLAN 1, RATIO = 1.00

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
+		(CFS)				
+ 786.	12.00		189.	62.	62.	62.
		(INCHES)	8.054	10.609	10.609	10.609
		(AC-FT)	94.	123.	123.	123.

CUMULATIVE AREA = .22 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .41	RATIO 2 .67	RATIO 3 .82	RATIO 4 .92	RATIO 5 1.00
HYDROGRAPH AT +	P1ab	.07	1	FLOW	162.	275.	339.	382.	416.
				TIME	12.17	12.17	12.17	12.17	12.17
ROUTED TO +	POND	.07	1	FLOW	125.	184.	259.	309.	349.
				TIME	12.25	12.33	12.25	12.25	12.25
			** PEAK STAGES IN FEET **						
			1	STAGE	4.83	7.87	9.03	9.63	10.09
				TIME	12.25	12.33	12.25	12.25	12.25
HYDROGRAPH AT +	P3	.12	1	FLOW	261.	459.	573.	648.	708.
				TIME	12.08	12.08	12.08	12.08	12.08
ROUTED TO +	POND	.12	1	FLOW	244.	401.	503.	581.	647.
				TIME	12.17	12.25	12.25	12.25	12.17

```
                                   ** PEAK STAGES IN FEET **
                                   1   STAGE        3.83     6.74     8.57     9.23     9.77
                                       TIME        12.17    12.25    12.25    12.25    12.17

 HYDROGRAPH AT
+                   E3       .12    1   FLOW         276.     498.     625.     709.     776.
                                       TIME        12.08    12.08    12.08    12.08    12.08

  2 COMBINED AT
+                   COMB     .25    1   FLOW         499.     846.    1036.    1181.    1308.
                                       TIME        12.08    12.08    12.08    12.17    12.17

 HYDROGRAPH AT
+                   P1c      .01    1   FLOW          16.      30.      38.      43.      47.
                                       TIME        12.25    12.25    12.25    12.25    12.25

 HYDROGRAPH AT
+                   P1d      .01    1   FLOW          29.      53.      67.      76.      83.
                                       TIME        12.00    12.00    12.00    12.00    12.00

 HYDROGRAPH AT
+                   E1       .49    1   FLOW         721.    1336.    1689.    1922.    2109.
                                       TIME        12.25    12.25    12.25    12.25    12.25

 HYDROGRAPH AT
+                   E2       .26    1   FLOW         514.     934.    1175.    1334.    1461.
                                       TIME        12.17    12.08    12.08    12.08    12.08

  6 COMBINED AT
+                   COMB    1.09    1   FLOW        1795.    3192.    3986.    4608.    5088.
                                       TIME        12.17    12.17    12.17    12.17    12.17

 HYDROGRAPH AT
+                   P4a      .03    1   FLOW          74.     130.     162.     183.     200.
                                       TIME        12.00    12.00    12.00    12.00    12.00

 HYDROGRAPH AT
+                   P4b      .09    1   FLOW         147.     250.     309.     349.     380.
                                       TIME        12.33    12.33    12.33    12.33    12.33

 ROUTED TO
+                   POND     .09    1   FLOW          74.     188.     261.     308.     343.
                                       TIME        12.83    12.58    12.50    12.50    12.50

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE        6.11     8.69     9.27     9.64     9.89
                                       TIME        12.83    12.58    12.50    12.50    12.50

 HYDROGRAPH AT
+                   P4c      .05    1   FLOW          88.     150.     186.     209.     228.
                                       TIME        12.25    12.25    12.25    12.25    12.25

  2 COMBINED AT
+                   COMB     .14    1   FLOW         140.     262.     377.     453.     505.
                                       TIME        12.25    12.58    12.50    12.42    12.42

 HYDROGRAPH AT
+                   E4       .05    1   FLOW         127.     235.     297.     338.     370.
                                       TIME        12.00    12.00    12.00    12.00    12.00

  3 COMBINED AT
+                   COMB     .22    1   FLOW         289.     513.     637.     720.     786.
                                       TIME        12.08    12.00    12.00    12.00    12.00


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

APPENDIX F

HEC-RAS RESULTS FOR EXISTING CONDITION

```
HEC-RAS Version 3.1.1 May 2007
U.S. Army Corps 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: PALACIOS DE GURABO
Project File : CREEK1.prj
Run Date and Time: 7/18/2005 1:41:41 PM

Project in SI units

PLAN DATA

Plan Title: CREEK1-EXISTING-CONDITION
Plan File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.p01

Geometry Title: CREEK1-EXISTING-CONDITION
Geometry File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.g01

Flow Title : CREEK1-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f01

Plan Summary Information:

Number of:	Cross Sections =	20	Multiple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.003
Maximum number of iterations = 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: Mixed Flow

FLOW DATA

Flow Title: CREEK1-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f01

Flow Data (m3/s)

River	Reach	RS	1807	807	257	107	[illegible]
1	1	20	21.97	20.07	17.7	14.1	7.[illegible]
1	1	17	41.85	38.[illegible]	43.53	38.7	14.4
1	1	14	83.02	75.[illegible]	66.8	11.31	4.4
1	1	12	85.17	77.[illegible]	68.69	14.[illegible]	[illegible]
1	1	11	145.28	132.4	116.32	42.46	[illegible]
1	1	7	149.13	136.11	119.0	51.29	[illegible]
1	1	4	157.31	141.09	124.42	102.19	54.[illegible]
1	1	1	160.9	140.[illegible]	129.11	102.[illegible]	15.[illegible]

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1	1	1807	Critical	Known WS = 53.39
1	1	807	Critical	Known WS = 53.22
1	1	257	Critical	Known WS = 53.06
1	1	107	Critical	Known WS = 52.72
1	1	7	Critical	Known WS = 52.14

GEOMETRY DATA

Geometry Title: CREEK1-EXISTING-CONDITION
Geometry File : p:\278-Palacios de Guizado\HEC-RAS\CREEK1.g01

CROSS SECTION

RIVER: 1
REACH: 1 RS: 20

INPUT
Description: section20
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	117.41	1.29	117	1.55	116.92	4.53	116	5.93	115.64
6.13	115.59	6.57	115.48	7.17	115.28	9.87	115.04	7.96	115
8.19	114.54	9.62	114.39	9.88	114.28	10.12	114.19	10.21	114.16
10.27	114.14	10.83	114	10.87	113.91	11.73	113.56	13.2	113
14.19	112.69	16.27	112	17.04	111.68	18.8	111	20.51	110.26
20.97	110.08	21.17	110	21.32	109.94	21.69	109.78	23.55	109
25.1	108.33	25.84	108	27.72	107.17	28.1	107	28.42	106.83
30.2	106	31.38	105.4	31.72	105.23	32.15	105	32.58	104.8
32.94	104.63	33.18	104.51	34.13	104	35.75	103.22	36.29	103
36.97	102.8	39.39	102	41.83	101.18	42.36	101	42.83	100.83
42.8	100.81	43	100.78	43.13	100.73	43.34	100.66	43.68	100.55
44.35	100.33	45.38	100	45.64	99.91	46.22	99.71	46.58	99.58
46.98	99.45	48.41	99	48.75	99	49.46	98.7	51.39	98
53.07	97.38	53.96	97	54.04	96.57	56.45	96	58.77	95.02
58.8	95	58.85	94.98	59.41	94.73	61.07	94	61.93	93.62
63.27	93	64.22	92.58	65.46	92	66.32	91.62	67.63	91
68.55	90.59	68.84	90.46	69.54	90.13	69.8	90	70.12	89.84
71.84	89	72.22	89	72.85	89	72.9	89.13	73.23	89.31
74.47	90	74.9	90.25	76.21	91	77.79	91.87	78.02	92
78.03	92.44	79.38	93	80.26	93.27	81.53	94	83.17	94.96
83.24	95	84.4	95.64	84.86	95.8	84.78	95.86	84.87	95.91
84.91	95.93	84.94	95.94	84.99	95.95	84.98	95.96	85.06	96
85.12	96.03	87.01	97	87.21	97.1	88.95	98	90.5	98.78
90.93	99	91.81	99.44	92.16	99.62	92.9	99.99	92.92	100
93.43	100.25	95.29	101	96.62	101.59	97.6	102	99.36	102.85
98.69	103	101.35	103.74	101.82	104	103.41	104.67	104.12	105
104.22	105	104.42	105	105.83	105.27	106.48	105.31	106.93	105.31
107.6	105.35	108.29	105.45	108.92	105.49	109.37	105.54	109.87	105.58
110.27	105.61	112.42	105.8	112.6	105.84	112.74	105.86	112.88	105.88
113.37	105.94	115.43	105.95	115.46	105.95	115.5	105.95	115.55	105.95
116.72	106	117.22	106.02	117.24	106.03	118.09	106.04	118.93	106.07
119.04	106.07	119.84	106.14	119.93	106.14	120.24	106.18	121	106.29
121.27	106.32	122.35	106.42	123.36	106.55	123.8	106.56	124.28	106.52
124.77	106.46	125.48	106.35	125.88	106.32	127.54	106	127.59	105.99
127.6	105.99	128.68	105.82	128.84	105.77	129.69	105.64	130.17	105.51
130.66	105.41	131.54	105.12	131.97	105	134.26	104.28	134.9	104.08
135.01	104.05	135.17	104	135.21	103.98	135.41	103.92	136.96	103.48
138.3	103.02	138.51	103.02	138.55	103	141.37	102.2	141.95	102.09
142.03	102.07	142.56	102.04	142.62	102.08	143.21	102.2	146.01	103
148.45	103.71	149.49	104	150.24	104.19	150.7	104.3	151.56	104.47
152.33	104.53	152.54	104.55	153.09	104.54	155.71	104.52	161.15	104.41
161.21	104.4	161.7	104.4	162.35	104.37	162.78	104.36	163.16	104.44
163.78	104.73	163.9	104.77	164.32	105	166.03	105.85	166.2	105.93
166.82	106	166.53	106.11	168.02	106.81	168.44	107	168.64	107.09
170.63	108	171.06	108.23	172.71	109	173.78	109.59	174.01	109.71
174.32	109.87	174.56	110	175.38	110.49	175.97	110.67	176.1	110.73
176.21	110.78	176.7	111	177.02	111.14	178.97	112	179.19	112.08

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	61.07	.045	83.17	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
61.07	83.17	64.481	64.694	67.416	.1	.3

CROSS SECTION OUTPUT Profile #100

E.G. Elev (m)	[illegible]	Element	Left OB	Channel	Right OB
Vel Head (m)	[illegible]	St. n-Val.		0.045	
W.S. Elev (m)	[illegible]	Reach Len. (m)	64.48	64.69	67.42
Crit W.S. (m)	[illegible]	Flow Area (m2)		7.12	
E.G. Slope (m/m)	[illegible]	Area (m2)		7.12	
Q Total (m3/s)	[illegible]	Flow (m3/s)		21.97	
Top Width (m)	[illegible]	Top Width (m)		7.47	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		3.09	
Max Chl Dpth (m)	[illegible]	Hydr. Depth (m)		0.95	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		142.6	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		8.31	
Min Ch El (m)	[illegible]	Shear (N/m2)		199.22	
Alpha	[illegible]	Stream Power (N/m s)		614.92	
Froth Loss (m)	[illegible]	Cum Volume (1000 m3)	29.58	64.09	21.74

C & E Loss (m)	0.04	Cum CA (1000 m2)	14.24	44.41	19.88

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 14

INPUT
Description: section15
Station Elevation Data num= 145

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.08	.26	101.06	.35	101.05	.42	101.05	.47	101.04
1.7	101	2.09	100.99	2.11	100.98	2.13	100.98	2.17	100.97
2.27	100.96	2.37	100.95	6.85	100.24	9.23	100.17	9.85	100.09
10.03	100	10.48	99.9	13.44	99	14.38	98.72	16.14	98.15
16.51	98.07	16.35	98	19.45	97.43	21.66	97	26.12	96.34
26.35	96	26.45	95.98	26.46	95.97	26.48	95.97	26.5	95.96
26.53	95.96	26.56	95.95	26.61	95.95	27.89	95.77	28.15	95.75
29.26	95.72	29.42	95.69	30.47	95.21	33.99	94.86	34.53	94.43
35.79	94.21	35.96	94.2	36.01	94.16	36.11	94.13	36.21	94
38.14	93.64	40.85	93	41.71	92.79	47.35	92	47.85	91.92
49.94	91.66	51.69	91.24	55.37	91.1	56.98	91	57.09	90.98
57.1	90.99	57.11	90.99	57.12	90.99	57.14	90.99	57.15	90.99
57.18	90.98	62.38	90.28	63.41	90.22	63.94	90.15	64.01	90.08
65.04	90	65.6	89.92	66.57	89.77	67.34	89.64	67.38	89.54
68.38	89.45	68.7	89.39	70.93	89	74.47	88.29	75.75	88
80.64	87.1	81.33	87	83.29	86.87	83.72	86.69	87.15	86.5
87.36	86.28	87.6	86.24	88.1	86.17	88.5	86.15	90.13	87
91.65	87.6	92.02	87.778	92.49	88	93.39	89.06	94.75	89
96.34	89.71	96.49	90	97.52	90.24	97.75	90.34	99.12	91
100.68	91.66	101.43	92	102.82	92.62	103.73	93	106.7	93.17
106.03	94	108.05	94.75	108.47	94.83	108.92	94.91	109.11	95
110.34	95.22	112.03	95.59	112.9	95.68	112.83	95.76	113.7	95.92
113.23	95.84	113.34	95.89	114.15	96	116.21	96.27	116.67	96.3
121.35	97	127.69	97.86	128.82	98	129.75	98.12	133.1	98.55
133.49	98.32	133.64	98.39	133.34	98.39	135.22	98.54	135.51	98.59
146.32	98.64	140.33	98.85	143.82	98	145.33	97.89	146.21	97.2
147.46	97	147.63	96.93	147.77	96.88	148.02	96.76	148.82	96.19
149.73	96	150.3	95.74	151.54	95	152.7	94.34	152.85	94.22
153.07	94.15	153.18	94.11	153.37	94	153.47	93.95	153.49	93.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	75.79	.045	92.02	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan
75.79	92.02	14.856	20.564	70.969	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	98.20	Element	Left OB	Channel	Right OB
Vel Head (m)	1.11	Wt. n-Val.		.055	
W.S. Elev (m)	97.08	Reach Len. (m)	59.69	[illegible]	[illegible]
Crit W.S. (m)	97.42	Flow Area (m2)		[illegible]	
E.G. Slope (m/m)	[illegible]	Area (m2)		[illegible]	
Q Total (m3/s)	22.47	Flow (m3/s)		[illegible]	
Top Width (m)	[illegible]	Top Width (m)		[illegible]	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		[illegible]	
Max Chl Dpth (m)	[illegible]	Hyd. Depth (m)		[illegible]	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		[illegible]	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		[illegible]	
Min Ch El (m)	[illegible]	Shear (N/m2)		[illegible]	
Alpha	[illegible]	Stream Power (N/m s)		[illegible]	
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)	29.28	[illegible]	11.74
C & E Loss (m)	[illegible]	Cum CA (1000 m2)	14.24	[illegible]	19.88

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS:

INPUT
Description: section1[illegible]
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	88.95	2.69	88.54	8.85	88	13.09	87.66	21.69	87
22.25	86.95	23.1	86.89	23.34	86.89	31.4	86.34	38.02	86
41.64	85.81	41.82	85.8	42.07	85.8	42.4	85.79	42.81	85.78
43.3	85.76	43.89	85.74	44.6	85.72	45.43	85.68	52.86	85.36
53.94	85.32	55.06	85.27	56.19	85.23	57.31	85.18	58.33	85.13
58.49	85.13	60.04	85.06	60.24	85.06	61.42	85.02	61.43	85.02
62.12	85	62.41	85	63.01	84.99	64.11	84.97	64.14	84.97
65.38	84.95	66.65	84.94	67.88	84.92	68.81	85	69.09	85
70.16	85	70.56	85	71.3	85	71.91	85	72.63	85
74.96	85.86	75.19	85.95	79.02	85.96	75.33	86	75.4	86.02
78.08	87	79.87	87.66	80.82	88	83.03	88.85	83.43	89
84.3	89.34	85.93	90	88.19	90.66	88.81	90.84	89.01	90.9
89.37	91	92.74	91.27	94.64	92	96.27	92.29	100.4	93
102.51	93.35	102.78	93.38	102.93	93.38	103.48	93.47	106.61	93.71
106.97	93.7	108.2	93.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	45.43	.045	74.96	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.43	74.96	83.008	83.075	83.193	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	85.78	Element	Left OB	Channel	Right OB
Vel Head (m)	0.21	Wt. n-Val.		0.045	
W.S. Elev (m)	85.57	Reach Len. (m)	83.01	83.08	83.19
Crit W.S. (m)	85.57	Flow Area (m2)		10.80	
E.G. Slope (m/m)	0.027325	Area (m2)		10.80	
Q Total (m3/s)	21.97	Flow (m3/s)		21.97	
Top Width (m)	26.11	Top Width (m)		26.11	
Vel Total (m/s)	2.03	Avg. Vel. (m/s)		2.03	
Max Chl Dpth (m)	0.41	Hydr. Depth (m)		0.41	
Conv. Total (m3/s)	132.9	Conv. (m3/s)		132.9	
Length Wtd. (m)	83.08	Wetted Per. (m)		26.23	
Min Ch El (m)	84.92	Shear (N/m2)		110.38	
Alpha	1.00	Stream Power (N/m s)		224.48	
Frctn Loss (m)	0.44	Cum Volume (1000 m3)	29.58	63.23	21.74
C & E Loss (m)	0.22	Cum SA (1000 m2)	14.24	42.77	19.68

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 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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 17

INPUT
Description: section1[illegible]
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.2	82.27	.79	82	4.43	81.1	5.07	81	6.4	80.69
7.12	80.52	8.2	80.27	9.38	80	10.51	79.77	11.47	79.54
12.63	79.29	13.82	79	15.73	78.59	17.08	78.3	18.4	78
22.94	77.02	23.81	77.01	23.95	77	28.13	76.98	27.78	76
31.07	75.11	32.52	75	33.83	74.74	34.68	74.59	38.48	74.45
38.8	74.44	39.27	74.59	39.4	74.57	40.66	74.83	40.75	74.84
41.34	75	43.1	75.31	43.81	75.72	44.06	75.79	44.84	76
46.43	76.46	48.33	77	48.47	77.04	48.51	77.07	49.72	77.34
50.4	77.5	52.32	77.7	53.09	77.84	53.61	78	53.19	78.14
53.35	78.18	54.83	78.91	55.15	78.44	55.21	78.87	55.28	79
55.33	79.02	55.38	79.04	55.59	79.15	57.27	80	57.43	80.08
59.18	81	60.03	81.65	61.08	82	62.18	82.6	62.99	83
64.28	83.63	64.88	84	66.05	84.42	66.55	84.91	66.71	85
67.56	85.46	68.26	85.82	68.4	85.9	68.45	85.93	68.59	86
68.84	86.19	70.47	87	72.12	87.8	72.31	88	72.42	88.06
74.2	89	75.82	89.9	76.25	90	77.1	90.56	77.88	90.7
77.55	90.79	77.66	90.84	78.01	91	78.68	91.94	79.79	92
79.97	92.1	81.39	93	82.11	93.23	82.78	93.56	85.84	94
86.06	94	86.74	94	87.47	94	93.61	94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

.2	.055	27.78	.045	42.01	.055

Bank Sta: Left	Right	lengths: Left	Channel	Right	Coeff Contr.	Expan.
27.78	43.81	83.254	82.13	81.9	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	78.96	Element	Left OB	Channel	Right OB
Vel Head (m)	2.82	Wt. n-Val.		0.045	
W.S. Elev (m)	75.25	Reach Len. (m)	83.25	82.13	81.90
Crit W.S. (m)	75.88	Flow Area (m2)		5.60	
E.G. Slope (m/m)	0.274874	Area (m2)		5.60	
Q Total (m3/s)	41.45	Flow (m3/s)		41.45	
Top Width (m)	10.81	Top Width (m)		10.81	
Vel Total (m/s)	7.44	Avg. Vel. (m/s)		7.44	
Max Chl Dpth (m)	0.81	Hydr. Depth (m)		0.52	
Conv. Total (m3/s)	79.4	Conv. (m3/s)		79.4	
Length Wtd. (m)	82.13	Wetted Per. (m)		10.38	
Min Ch El (m)	74.44	Shear (N/m2)		1374.55	
Alpha	1.00	Stream Power (N/m s)		10221.76	
Frctn Loss (m)	7.46	Cum Volume (1000 m3)	29.59	42.55	21.74
C & E Loss (m)	0.26	Cum WA (1000 m2)	14.24	41.24	19.08

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 PS: 16

INPUT
Description: sections/
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78.93	.07	78.93	1.37	78.95	2.6	78.93	3.85	78.91
5.83	78.88	6.23	78.84	8.06	78.75	8.63	78	11.79	77.16
13.55	77	13.95	76.80	15.15	76	19.18	75.79	19.45	75.75
19.91	75.64	20.79	75.45	22.82	75.02	22.97	75.02	27.95	75
28.7	74.64	29.74	74	30.47	73.7	36.33	73.71	38.12	74
42.42	74.85	43.2	74.98	43.74	75	46.69	75.67	49.95	75.93
47.03	75.98	47.2	76	47.64	76.12	50.17	76.8	51	77
51.99	77.5	52.53	77.49	53.06	77.55	53.63	77.64	53.83	77.7
54.06	77.75	56.62	77.74	58.09	78	58.31	78	59.29	78.13
60.13	78.44	62.77	79	63.91	79	65.28	79.74	66.23	80
66.47	80.12	69.1	81	69.12	81	69.15	81	71.76	81.43
74.14	82	76.4	82.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	22.82	.045	42.42	.055

Bank Sta: Left	Right	lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.82	42.42	148.1	91.89	79.666	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	75.92	Element	Left OB	Channel	Right OB
Vel Head (m)	.18	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	75.74	Reach Len. (m)	148.10	91.89	79.67
Crit W.S. (m)	75.74	Flow Area (m2)	0.23	24.12	0.40
E.G. Slope (m/m)	0.017774	Area (m2)	0.23	24.12	0.40
Q Total (m3/s)	41.02	Flow (m3/s)	0.16	41.26	0.60
Top Width (m)	14.33	Top Width (m)	1.70	10.90	1.73
Vel Total (m/s)	1.31	Avg. Vel. (m/s)	0.69	1.28	1.50
Max Chl Dpth (m)	1.64	Hydr. Depth (m)	0.14	1.24	0.23
Conv. Total (m3/s)	234.5	Conv. (m3/s)	1.2	419.7	4.5
Length Wtd. (m)	91.79	Wetted Per. (m)	1.53	19.83	2.28
Min Ch El (m)	73.77	Shear (N/m2)	24.38	111.47	45.02
Alpha	1.14	Stream Power (N/m s)	18.18	119.50	45.61
Frctn Loss (m)	1.21	Cum Volume (1000 m3)	29.77	41.22	21.2
C & E Loss (m)	1.15	Cum WA (1000 m2)	14.17	39.99	19.54

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 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: 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 supercritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 15

INPUT
Description: section15
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.01	.09	100	1.44	99.84	2.47	99.74	3.06	99.68
3.38	99.6	4.2	99.51	5.1	99.28	5.67	99.2	5.88	99.16
6.48	99	6.98	98.78	8.42	98	9.89	97.28	10.33	97
11.71	96.91	12.2	96	13.13	95.37	13.65	95.23	14.19	95
14.44	94.77	14.94	94.63	15.15	94.54	15.32	94.47	16.19	94
16.76	93.66	18.21	93	19.22	92.53	20.4	92	22.22	91.3
22.95	91	24.17	90.54	24.69	90.43	24.98	90.24	25.62	90
27.06	89.49	27.56	89.24	27.74	89.18	28.17	89	28.33	88.93
30.71	88	30.91	87.91	33.3	87	34.23	86.69	35.25	86.41
36.51	86	37.48	85.69	39.5	85	40.05	84.81	42.39	84
43.1	83.76	45.3	83	46.24	82.87	49.39	82	51.38	81.49
53.23	81	55.63	80.08	55.78	80	56.04	79.86	57.65	79
58.12	78.63	59.68	78	61.25	77.14	61.46	77	63.08	76.41
63.77	76.18	63.87	76.14	64.18	76	64.47	75.86	64.67	75.79
65.3	75.54	66.69	75	67	74.85	68.72	74	69.84	73.35
70.58	73	72.09	72.26	72.6	72	73.63	71.54	74.7	71
75.65	70.72	76.11	70.57	77.61	70.07	77.83	70	78.2	70
78.63	70	79.91	70	84.32	69.57	85.7	69.53	87.51	69.45
87.76	69.44	88.27	69.42	94.5	69.6	94.8	69.59	95.23	69.63
95.53	69.64	95.91	69.67	96.55	69.69	97.2	69.72	97.51	69.73
98.19	69.76	101.67	69.96	101.72	69.96	101.8	69.96	102.19	70
103.99	70	104.6	70	108.02	70	108.4	70	108.57	70
108.92	70	108.99	70	109.3	69.9	109.52	69.893	112.25	69
115.1	68.26	115.56	68.14	116.27	68	116.37	67.94	116.45	67.93
116.72	67.89	117.13	67.83	119.23	67.4	122.47	67	126.14	67
128.59	67	130.27	67	131.02	67	131.94	67	132.46	67
132.97	67	134.18	67	134.45	67	135.96	67	137.16	67
138.3	67	138.79	67	139.33	67	140.57	67	142.71	67.5
145.05	68	146.94	68.48	148.27	69	149.69	69.65	150.19	69.88
150.49	70	151.36	70.32	152.01	70.53	153.01	71	153.16	71.08
154.76	72	155.43	72.41	156.44	73	158.84	73.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	109.52	.045	149.69	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
109.52	149.69	131.06	96.443	61.927	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	71.05	Element	Left OB	Channel	Right OB
Vel Head (m)	1.56	Wt. n-Val.		0.045	
W.S. Elev (m)	69.49	Reach Len. (m)	131.06	96.44	61.93
Crit W.S. (m)	68.15	Flow Area (m2)		10.21	
E.G. Slope (m/m)	0.433187	Area (m2)		10.21	
Q Total (m3/s)	85.37	Flow (m3/s)		85.37	
Top Width (m)	23.55	Top Width (m)		23.55	
Vel Total (m/s)	8.36	Avg. Vel. (m/s)		8.36	
Max Chl Dpth (m)	0.43	Hydr. Depth (m)		0.43	
Conv. Total (m3/s)	129.7	Conv. (m3/s)		129.7	
Length Wtd. (m)	96.44	Wetted Per. (m)		23.64	
Min Ch El (m)	67.00	Shear (N/m2)		1835.10	
Alpha	1.50	Stream Power (N/m s)		15337.90	
Frctn Loss (m)	4.57	Cum Volume (1000 m3)	29.55	59.74	21.71
C & E Loss (m)	0.00	Cum EA (1000 m2)	14.06	38.01	19.55

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 14

INPUT
Description: section14
Station Elevation Data num= 143

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	98.5	.17	98.1	.34	98.53	1.9	98.81	4.27	98.84

4.44	96.04	4.68	96.07	5.4	96.91	5.95	96.9	8.73	94
9.21	95.84	9.23	95.81	9.24	95.78	9.55	95.72	9.86	95.62
10.82	95.3	11.7	95	12.17	94.91	12.98	94.74	16.35	94.85
17.42	94.81	17.68	94.8	18.53	94.93	18.64	94.9	19.02	95
19.98	95	20.61	95	21.28	94.14	22.4	93.91	23.87	93
24.59	92.93	25.59	92.42	26.79	92	28.27	91.52	29.8	91
31	90.41	32.79	90	34.13	90	34.37	90	34.56	90
34.84	90	35.33	90	35.44	90	36.78	89.68	37.49	89.46
38.92	89	38.33	88.82	40.32	88.12	41	88.09	41.17	88
41.74	87.65	42.55	87.12	42.7	87	43.08	86.93	43.13	86.92
43.22	86.81	43.42	86.88	43.95	86.8	47.06	86.28	49.39	86
49.94	85.9	48.97	85.87	50.2	85.79	52.3	85	52.38	84.37
52.72	84.82	54.52	84	55.47	83.55	56.71	83	57.62	82.59
58.82	82	59.63	81.53	60.47	81	62.19	80.05	62.29	80
62.41	79.83	64	79	64.92	78.5	65.78	78	66.97	77.37
67.63	77	68.76	76.45	69.87	76	71.03	75.2	71.29	75
71.76	74.81	73.31	74	74.1	73.54	75.07	73	76.06	72.44
76.83	72	77.73	71.48	78.63	71	80.16	70.13	80.38	70
80.52	69.83	80.89	69.73	82.22	69	83.34	68.34	83.94	68
85.32	67.23	85.71	67	87.02	66.26	87.53	66	88.68	66
89.88	66	92.69	66	94.32	66	94.48	65.98	94.69	66
100.26	66.78	101.41	67	107.25	67.8	107.5	67.82	108.55	68
108.86	68	111.87	68	116.39	68	128.63	68.83	129.88	68.86
130.88	68.86	131.38	69	134.4	69.33	136.38	69.55	138.92	69.82
139.45	69.89	139.94	69.94	140.28	69.94	140.42	70	141.67	70.22
143.02	70.86	143.49	70.77	144.35	71	145.48	71.36	147.24	72
148.62	72.52	149.84	73	150.17	73.1	152.73	74	153.48	74.21
153.63	74.25	153.97	74.33	154.5	74.48	155.32	74.74	156.17	75
157.05	75.24	159.87	76	160.83	76.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	83.34	.045	107.25	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
83.34	107.25	87.1	91.634	97.207	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	98.30	Element	Left OB	Channel	Right OB	
Vel Head (m)	0.58	Wt. n-Val.		0.045		
W.S. Elev (m)	97.73	Reach Len. (m)	97.16	91.63	97.21	
Crit W.S. (m)	97.73	Flow Area (m2)		25.40		
E.G. Slope (m/m)	0.019875	Area (m2)		25.40		
Q Total (m3/s)	85.37	Flow (m3/s)		85.37		
Top Width (m)	22.28	Top Width (m)		22.28		
Vel Total (m/s)	3.36	Avg. Vel. (m/s)		3.36		
Max Chl Dpth (m)	1.75	Hydr. Depth (m)		1.14		
Conv. Total (m3/s)	605.5	Conv. (m3/s)		605.5		
Length Wtd. (m)	91.23	Wetted Per. (m)		22.85		
Min Ch El (m)	95.88	Shear (N/m2)		216.60		
Alpha	1.30	Stream Power (N/m s)		728.07		
Frctn Loss (m)	1.29	Cum Volume (1000 m3)	29.55	58.02	21.71	
C & E Loss (m)	0.10	Cum XA (1000 m2)	14.96	15.16	13.35	

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 not equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid supercritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 12

INPUT
Description: section11
Station Elevation Data num= 141

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.99	1.18	87.15	1.42	87	2.6	86.65	3.78	86
5.28	85.22	5.42	85.04	5.72	85	5.75	84.96	6.07	84.77
7.44	84	8.12	83.26	9.22	83	9.84	82.6	10.96	82
11.62	81.6	12.46	81	13.73	80.23	13.89	80.13	14.09	80
14.33	79.87	16.01	79	17.13	78.36	17.63	78	19.82	77.17
19.26	77	20.75	76.32	20.73	76	20.85	75.85	20.87	75.48
20.92	75.41	21.06	74.47	22.4	75	22.69	74.87	24.31	74
24.61	73.85	24.82	73.79	25.33	73.53	25.93	73.41	26.23	73.39
26.8	73.3	27.22	73.27	28.47	73.19	29.47	73.06	29.66	73.04
29.85	73	31.21	72.58	33.54	72	34.82	71.8	35.46	71.64
36.93	71.27	37.94	71	38.12	70.97	38.13	70.95	38.27	70.95
39.63	71.21	40.49	71.[illegible]	41.11	70	41.96	69.78	42.46	69.52
42.11	69.47	44.[illegible]	[illegible]	[illegible]	68.52	48.19	68	50.78	[illegible]

51.42	67	51.82	66.91	52.37	66.74	52.82	66.62	53.83	66.34
55.04	66	56.01	65.73	56.31	65.63	56.91	65.46	58.5	65.01
58.54	65	58.55	65	59.3	64.8	62.42	64	65.91	63.1
66.33	63	66.56	63	66.74	63	67.17	63	67.96	63.13
72.25	64	76.78	64.69	77.28	65	79.14	65	79.58	65
80.22	64.89	80.86	64.77	84.89	64	89.85	63.12	90.52	63
92.42	62.4	94.11	62.42	94.29	62.43	96.58	62.99	96.61	63
96.62	63	98.4	63.24	98.84	63.28	99.52	63.35	100.92	63.5
104	63.75	104.88	64	105.44	64	105.46	64	105.75	64
106.11	64.07	106.2	64.08	107.81	64.33	108.14	64.39	108.65	64.48
109.53	64.64	110.09	64.73	110.9	64.87	111	64.89	111.64	65
112.07	65.08	112.3	65.13	113.2	65.24	113.78	65.47	116.17	66
116.5	66.08	119.74	67	120.17	67.13	122.62	68	124.5	68.63
125.89	69	128.99	69	130.43	69.5	130.54	69.53	130.94	69.5
131.27	69.53	131.68	69.52	132.18	69.51	132.56	69.5	133.53	69.51
133.94	69.49	134.31	69.48	134.81	69.46	136.8	69.41	137.21	69.39
137.55	69.38	137.87	69.39	138.19	69.39	138.46	69.41	138.97	69.47
139.45	69.52	140.25	69.62	141.64	69.8	143.26	70	143.76	70.06
144.24	70.21	145.83	70.31	146.11	70.35	146.67	70.43	147.64	70.55
148.23	70.61	148.9	70.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	79.14	.045	110.09	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
79.14	110.09	73.04	131.422	191.556	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	66.06	Element			
Vel Head (m)	1.13	Wt. n-Val.	0.055	0.045	
W.S. Elev (m)	63.93	Reach Len. (m)	73.04	131.42	191.56
Crit W.S. (m)	64.29	Flow Area (m2)	4.77	14.10	
E.G. Slope (m/m)	0.076092	Area (m2)	4.77	14.10	
Q Total (m3/s)	85.37	Flow (m3/s)	15.23	70.14	
Top Width (m)	28.33	Top Width (m)	9.23	19.10	
Vel Total (m/s)	4.52	Avg. Vel. (m/s)	3.19	4.98	
Max Chl Dpth (m)	1.53	Hydr. Depth (m)	0.52	0.74	
Conv. Total (m3/s)	308.3	Conv. (m3/s)	55.0	253.3	
Length Wtd. (m)	127.33	Wetted Per. (m)	9.44	19.40	
Min Ch El (m)	62.40	Shear (N/m2)	379.84	546.65	
Alpha	1.69	Stream Power (N/m s)	1212.94	2719.61	
Frctn Loss (m)	1.18	Cum Volume (1000 m3)	29.34	56.21	21.71
C & E Loss (m)	0.06	Cum SA (1000 m2)	13.66	33.90	19.55

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 12

INPUT:
Description: section12
Station Elevation Data num= 152

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.23	.07	87.2	.51	87	2.17	86.2	2.59	86.1
2.81	86.02	2.85	86	2.91	85.97	2.92	85.97	2.94	85.96
2.97	85.95	3.02	85.94	3.14	85.9	5.91	85	7.8	84.39
8.14	84.28	8.33	84.21	8.49	84.17	8.54	84.15	8.6	84.13
8.89	84	9.24	83.92	12.06	83	12.14	82.97	12.38	82.89
14.66	82	17.66	81.09	17.76	81	18.04	80.9	18.1	80.89
18.18	80.86	18.29	80.83	18.49	80.76	18.9	80.62	20.43	80.11
20.75	80	20.84	79.96	21.7	79.66	23.59	79	25.9	78.26
28.75	78	27.39	77.63	30.01	77	31.5	76.48	33.19	76
34.69	75.45	35.13	75.27	35.85	75	37.8	74.26	38.14	74.14
38.51	74	38.78	73.91	41.13	73	41.58	72.81	43.56	72
45.9	71	45.91	71	45.92	70.99	45.93	70.99	45.97	70.98
49.12	70	50.37	69.17	50.66	69.05	50.7	69.04	50.72	69.03
50.73	69.02	50.74	69.02	50.75	69.01	50.78	69	50.79	68.99
51.41	68	53.17	67.86	55.03	67	55.61	66.68	57.07	66
58.36	65.35	58.87	65.11	59.12	65	59.26	64.93	59.62	64.75
61.18	64	61.89	63.55	63.13	63	64.12	62.29	64.74	62
65.15	61.43	65.82	61	66.82	60.09	66.91	60	67.03	59.89
68.2	59	68.45	59	68.48	59.01	68.49	59.01	68.52	59.03
70.75	60	70.91	60.02	71.4	60.36	72.07	60.55	72.33	60.65
73.15	61	74.53	61.58	75.54	62	76.37	62.32	77.36	62.49
79.57	62.72	79.26	62.88	79.92	63	81.67	63.12	82.69	63.17
84.21	63.24	84.55	63.3	85.19	63.29	85.72	63.32	86.5	63.36
87.4	63.42	88.7	63.5	94.05	63.98	94.26	64	94.28	64

94.16	64.42	98.53	65	98.72	65.04	99.65	65.28	100.17	65.42		
100.87	65.56	100.94	65.61	101.02	65.65	101.22	65.7	102.41	66		
105.91	66.88	106.41	67	107.21	67.1	109.82	67.82	110.75	68		
111.53	68.11	114.77	68.52	118.72	69	121.12	69.21	121.68	69.25		
122.73	69.34	125.11	69.53	130.66	70	133.58	70.2	138.96	70.6		
140.64	70.73	141.57	71	145.38	71.14	148.84	71.41	150.31	71.5		
150.78	71.54	151.97	71.63								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	83.13	.045	78.57	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
83.13	78.57	46.519	83.206	120.748	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.41	Element	Left OB	Channel	Right OB
Vel Head (m)	0.11	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.30	Reach Len. (m)	46.52	83.21	120.75
Crit W.S. (m)	62.38	Flow Area (m2)	1.73	50.18	14.31
E.G. Slope (m/m)	0.001168	Area (m2)	1.73	50.18	14.31
Q Total (m3/s)	95.37	Flow (m3/s)	0.76	76.74	17.87
Top Width (m)	35.12	Top Width (m)	2.57	15.44	17.11
Vel Total (m/s)	1.29	Avg. Vel. (m/s)	0.44	1.53	0.55
Max Chl Dpth (m)	5.30	Hydr. Depth (m)	0.67	3.25	0.84
Conv. Total (m3/s)	2497.9	Conv. (m3/s)	22.4	2245.1	230.2
Length Wtd. (m)	65.89	Wetted Per. (m)	2.88	17.54	17.21
Min Ch El (m)	59.00	Shear (N/m2)	6.87	32.73	9.53
Alpha	1.28	Stream Power (N/m s)	3.04	50.05	5.24
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	29.10	51.69	29.74
C & E Loss (m)	0.03	Cum SA (1000 m2)	13.29	31.63	17.51

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 11

INPUT
Description: section11
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.25	.59	74	1.34	73.66	2.9	73	3.51	[illegible]
5.27	72	5.83	71.76	7.22	71.23	8.04	71	8.63	70.8
8.97	70.68	10.11	70.23	11.02	70	13.68	69.12	13.87	69.09
13.93	69.04	14.05	69	14.21	68.38	17.27	68	18.66	67.76
19.76	67	20.07	66.65	22.61	66	23.56	65.4	23.92	65.33
24.08	65.33	25.64	65	25.75	64.89	29.42	64	31.24	63.39
31.45	63	32.53	62.58	32.6	62.48	34.57	62	37.51	61.22
38.3	61	41.46	60.16	42.07	60	44.22	59.89	47.07	59.14
49.47	59.04	57.94	59	60.14	59	68.61	59.05	71.73	58.6
84.18	58	85.14	58	85.24	58	85.1	58	87.91	57.24
88.62	57	89	57	89.24	57	89.84	57	90.95	57.754
91.17	57.88	91.35	58	92.53	58.81	97.84	59	98.55	59.17
94.34	60	95.07	60.51	95.77	61	95.86	61.13	97.14	62
97.44	62.23	98.44	63	99.12	63.45	99.92	64	101.28	64.99
101.34	65	102.22	65.14	105.1	65.57	108.14	66	108.79	66.14
109.62	66.12	110.4	67.47	130.94	67.48	134.65	67.29	134.94	67.[illegible]
137.2	67.44	138	67.51	138.21	67.47	138.4	67.49	138.68	67.47
138.98	67.46	139.13	67.46	139.62	67.47	141.65	67.52	142.23	67.5
146.08	67.32	146.47	67.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	84.18	.045	80.35	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
84.18	80.35	44.191	83.21	72.565	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.57	Element	Left OB	Channel	Right OB
Vel Head (m)	0.01	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.56	Reach Len. (m)	64.20	83.21	72.56
Crit W.S. (m)		Flow Area (m2)	262.85	46.42	31.88
E.G. Slope (m/m)	0.000066	Area (m2)	262.85	46.42	31.88
Q Total (m3/s)	145.09	Flow (m3/s)	106.65	29.20	9.24
Top Width (m)	72.89	Top Width (m)	58.75	6.77	7.47
Vel Total (m/s)	0.41	Avg. Vel. (m/s)	0.41	0.63	0.29
Max Chl Dpth (m)	7.29	Hydr. Depth (m)	4.49	6.84	3.37
Conv. Total (m3/s)	17795.2	Conv. (m3/s)	12155.8	3681.2	1158.7
Length Wtd. (m)	73.00	Wetted Per. (m)	37.45	7.13	11.56
Min Ch El (m)	57.00	Shear (N/m2)	2.35	4.20	1.74

Alpha	1.14	Stream Power (N/m s)	1.20	2.64	0.52
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	32.95	47.97	17.55
C & E Loss (m)	0.00	Cum EA (1000 m2)	11.85	30.71	16.31

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.38	1.25	73.35	4.06	73.36	4.36	73.36
4.48	73.4	5.13	73.45	5.66	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	9.69	73.03	9.75	73.01	9.78	73
10.27	72.73	10.99	72.58	11.83	72.26	12.36	72.21	13.18	72.09
13.64	72	13.88	71.99	18.66	71.24	19.63	71.09	20.02	71.04
20.06	71.03	20.09	71.02	20.11	71.02	20.37	71	21.69	70.78
21.89	70.78	22.04	70.79	22.58	70.67	22.79	70.7	23.04	70.69
23.84	70.67	24.32	70.51	26.43	70	26.95	70	28.89	69.35
29.92	69	32.1	68.21	32.48	68.07	32.6	68.02	32.66	68
32.86	67.95	32.95	67.92	35.91	67	37.34	66.42	38	66
39.21	65.48	40.34	65	41.68	64.59	43.25	64	43.83	63.78
44.26	63.71	44.38	63.69	44.88	63.55	45.47	63.41	45.9	63.34
46.72	63.17	47.84	63	49.17	62.73	50.35	62.45	50.92	62.32
52.16	62	53.89	61.8	54.56	61.74	54.75	61.7	55.09	61.66
57.87	61.57	59.14	61.38	61.7	61.3	62.94	61.19	63.69	61.14
63.82	61.14	64.4	61.19	64.56	61.19	64.74	61.21	69.27	62
69.79	62.09	69.88	62.1	69.98	62.1	70.94	62.22	71.14	62.23
71.91	62.29	72.43	62.38	72.94	62.45	73.36	62.44	73.74	62.47
74.11	62.46	79.26	62	82.79	61.68	83.18	61.63	83.69	61.55
85.37	61.27	86.33	61	88.74	60.39	89.2	60.13	89.35	60
89.51	59.8	89.76	59	89.83	58.51	90.05	58	90.09	57.7
90.45	57.26	90.46	57.12	90.63	57	91.26	56.92	91.79	56.95
92.12	57	92.5	57.8	93.03	58	93.15	58.04	93.2	58
93.51	57.76	93.73	57.72	93.91	57.84	93.89	57.87	94.07	57.89
94.24	57.93	94.55	58	96.82	59.75	97.56	59	100.16	59.85
100.58	60	100.8	60.08	101.72	60.38	102.29	60.55	102.8	60.64
103.15	60.71	103.46	60.74	105.53	61	105.96	61.05	106.01	61.06
106.08	61.07	106.19	61.07	110.22	61.11	110.94	61.12	114.29	61.21
114.5	61.23	115.08	61.27	115.34	61.34	115.94	61.47	116.26	61.57
117.28	62	117.5	62.21	120.92	62.99	120.93	63	120.95	63
121.38	63.08	121.94	63.07	122.5	63.13	122.59	63.12	122.69	63.12
122.81	63.12	123.18	63.19	123.7	63.23	124	63.26	124.43	63.31
125.74	63.41	127.6	63.77	129.11	64	130.48	64.12	130.85	64.14
142.68	64.77	143.47	64.84	144.16	64.88	144.2	64.88	144.66	64.89
144.74	64.89	144.94	64.89	145.31	64.88	145.39	64.88	146.12	64.83
149.34	65	149.88	65	150.49	65	151.27	65	152	65
152.94	65	153.56	65	153.94	65	155.18	65	155.19	65
155.2	65	155.77	65	156.31	65	156.85	65	157.51	65
157.74	65	157.98	65	158.53	65	159.78	65	158.97	65
159.19	65	159.61	65	160.05	65	161.28	65	161.59	65
162.14	65	162.2	65	162.66	65	162.81	65	163.32	65
164.19	65	164.19	65	164.66	65	191.36	65.97	191.45	65.97
192.5	66	192.67	66	193.84	66	192.94	66	193.11	66
193.16	66	196.93	66.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
88.74	100.8	50.272	39.111	28.313	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.38	Element	Left OB	Channel	Right OB
Vel Head (m)	0.02	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.37	Reach Len. (m)	50.27	39.11	28.31
Crit W.S. (m)	61.12	Flow Area (m2)	108.60	70.22	68.84
E.G. Slope (m/m)	0.000220	Area (m2)	108.60	70.22	68.84
Q Total (m3/s)	145.09	Flow (m3/s)	51.25	64.18	29.66
Top Width (m)	95.12	Top Width (m)	46.38	12.06	33.69
Vel Total (m/s)	0.59	Avg. Vel. (m/s)	0.47	0.91	0.43
Max Chl Dpth (m)	7.31	Hydr. Depth (m)	2.34	5.82	2.04
Conv. Total (m3/s)	9771.5	Conv. (m3/s)	3451.9	4322.5	1997.3
Length Wtd. (m)	39.11	Wetted Per. (m)	46.99	15.23	34.15
Min Ch El (m)	56.92	Shear (N/m2)	5.80	8.57	4.36
Alpha	1.42	Stream Power (N/m s)	2.36	9.11	1.88
Frctn Loss (m)		Cum Volume (1000 m3)	31.04	44.28	13.89
C & E Loss (m)		Cum EA (1000 m2)	9.54	30.11	14.74

CULVERT

RIVER: 1
REACH: 1 RS: 9.5

INPUT
Description:
Distance from Upstream XS = 5
Deck/Roadway Width = 13.181
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.1	64.2		142.68	64.2	

Upstream Bridge Cross Section Data
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.36	1.25	73.39	4.06	73.36	4.36	73.38
4.68	73.4	5.13	73.45	5.66	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	9.69	73.03	9.75	73.01	9.78	73
10.27	72.73	10.99	72.59	11.89	72.26	12.36	72.21	13.18	72.09
13.84	72	13.88	71.88	18.66	71.24	19.63	71.09	20.02	71.06
20.06	71.05	20.09	71.02	20.11	71.02	20.37	71	21.69	70.78
21.88	70.78	22.06	70.79	23.58	70.67	22.78	70.7	23.04	70.69
23.84	70.53	24.12	70.51	28.83	70	28.95	70	28.89	68.23
29.92	69	32.1	68.21	32.46	68.09	32.6	68.02	32.66	68
32.86	67.85	32.95	67.92	35.91	67	37.34	66.42	38	66
39.27	65.48	40.34	65	41.68	64.59	43.25	64	43.83	63.78
44.06	63.71	44.38	63.63	44.86	63.55	45.47	63.41	45.9	63.34
46.72	63.17	47.84	63	49.17	62.73	50.35	62.45	50.82	62.32
52.56	62	53.88	61.8	54.56	61.74	54.75	61.7	55.09	61.66
57.87	61.57	58.14	61.56	61.7	61.3	62.84	61.19	63.65	61.14
63.82	61.14	64.4	61.19	64.56	61.19	64.74	61.21	69.27	62
69.78	62.09	69.88	62.1	69.98	62.12	70.94	62.22	71.14	62.23
71.81	62.29	72.43	62.38	72.94	62.45	73.36	62.44	73.74	62.47
74.11	62.46	79.26	62	82.79	62.68	83.18	61.63	83.69	61.59
85.07	61.27	86.13	61	88.74	60.19	89.2	60.13	89.35	60
89.51	59.8	89.76	59	89.83	58.51	90.05	58	90.09	57.1
90.15	57.26	90.46	57.12	90.63	57	91.26	56.92	91.79	56.95
92.02	57	92.5	57.8	93.03	58	93.15	58.04	93.2	58
93.51	57.76	93.7	57.2	93.91	57.44	93.99	57.07	94.07	57.19
94.24	57.93	94.35	58	96.82	58.75	97.56	59	100.16	59.37
100.59	60	100.9	60.06	101.72	60.38	102.29	60.55	102.8	60.54
103.15	60.71	103.36	60.79	105.53	61	105.96	61.05	106.01	61.14
106.06	61.07	106.13	61.07	110.22	61.11	110.94	61.12	114.23	61.21
114.5	61.23	115.08	61.27	115.34	61.34	115.94	61.47	116.26	61.57
117.28	62	117.8	62.21	120.82	62.99	120.91	63	120.95	63
121.88	63.08	121.94	63.07	122.5	63.13	122.55	63.12	122.69	63.12
122.81	63.13	123.18	63.19	123.7	63.23	124	63.26	124.43	63.31
125.06	63.41	127.4	63.77	129.11	64	130.48	64.12	130.85	64.21
142.68	64.77	143.47	64.84	144.16	64.98	144.2	64.88	144.66	64.89
144.74	64.89	144.84	64.89	145.31	64.88	145.59	64.88	146.12	64.83
148.84	65	149.09	65	150.49	65	151.27	65	152	65
152.54	65	153.5	65	153.84	65	155.19	65	155.19	65
155.2	65	155.77	65	156.71	65	156.95	65	157.51	65
157.74	65	157.98	65	158.53	65	158.78	65	158.97	65
159.19	65	159.21	65	160.95	65	161.28	65	161.59	65
162.04	65	162.1	65	162.66	65	163.01	65	163.12	65
163.78	65	164.14	65	164.66	65	191.36	65.47	191.45	65.51
192.5	66	192.71	66	192.84	66	192.94	66	193.11	66
193.16	66	198.71	66.10						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank Sta: Left Right Coeff Contr. Expan.
88.74 100.8 .1 .3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.33	64.2		142.2	64.2	

Downstream Bridge Cross Section Data
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.67	2.38	68.2	3.83	68	4.64	67.69	6.91	67
7.84	68.66	9.74	68	11.91	65.12	12.67	65	13.04	64.34
13.44	63.68	13.7	63.34	15.22	64	16.14	63.68	17.98	63
19.91	62.39	20.81	62	21.31	61.85	24.07	61	28.73	61.03
28.19	60.41	28.34	60.13	28.58	60.12	28.91	60.08	29.25	60
30.63	59.78	32.84	59.3	33.64	59.47	33.96	59.14	34.44	59.12
34.86	59.15	35	59.2	35.2	59.12	35.98	59	36.08	58.4
37.77	58	37.14	58	54.25	57.74	54.54	57	54.62	57
54.85	57	55.12	57	57.78	56.57	59.26	56.41	60.29	58.12
61.42	56	62.4	56	64.43	58	67.53	56.12	68.53	56.12

71.56	57	75.95	57.6	77.42	57.64	78.11	57.66	82.6	58
91.1	58.71	92.2	58.78	92.7	58.79	95.98	58.98	96.18	59
96.21	59	96.97	59.13	97.13	59.14	97.27	59.14	98.12	59.29
98.4	59.3	98.72	59.31	99.08	59.33	99.54	59.35	103.4	59.75
107.12	60	107.35	60	107.69	60	107.84	60	108.32	60
109.29	60.22	110.51	60.36	111.16	60.46	111.35	60.64	113.9	60.71
114.26	60.75	114.71	60.81	116.43	61	121.21	61.72	124.02	62
124.69	62.1	125.34	62.15	126.26	62.42	128.9	62.48	130.52	62.61
135.61	63	135.94	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.51	145.5	63.34	146.25	63.22	146.9	63.25	147.53	63.08
148.05	63	148.54	63	148.58	63	149.34	63.08	152.17	63.21
154.6	63.3	155.44	63.36	155.92	63.37	159.36	63.3	160.41	63.3
160.98	63.31	161.82	63.33	163.61	63.43	163.99	63.46	165.51	63.62
166.8	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.14	64.5	174.56	64.53	175.07	64.55	175.38	64.61
176.14	64.65	176.85	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.67	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	189.7	65.47	189.42	65.51	190.05	65.53
190.81	65.57	191.11	65.59	196.34	66	196.82	66	196.89	66
197.21	66	198.6	66	201.13	66.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	82.6	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
47.77	82.6	.1	.3

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 = 60.79
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	3.049	3.03

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

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	5	33.191	.013	.013	0	.6	1

Number of Barrels = 2
Upstream Elevation = 57.9
Centerline Stations

Sta.	Sta.
91.15	94.45

Downstream Elevation = 56.49
Centerline Stations

Sta.	Sta.
61.26	64.56

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #1

Q Culv Group (m3/s)	137.40	Culv Full Len (m)	33.18
# Barrels	2	Culv Vel US (m/s)	7.33
Q Barrel (m3/s)	68.74	Culv Vel DS (m/s)	7.11
E.G. US. (m)	64.54	Culv Inv El Up (m)	57.90
W.S. US. (m)	64.13	Culv Inv El Dn (m)	56.45
E.G. DS (m)	58.81	Culv Frctn Ls (m)	1.45
W.S. DS (m)	58.21	Culv Exit Loss (m)	3.47
Delta EG (m)	5.15	Culv Entr Loss (m)	1.64
Delta WS (m)	4.72	Q Weir (m3/s)	7.61
E.G. IC (m)	64.59	Weir Sta Lft (m)	42.32
E.G. OC (m)	64.54	Weir Sta Rgt (m)	134.81
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	60.09	Weir Max Depth (m)	0.15
Culv WS Outlet (m)	59.54	Weir Avg Depth (m)	0.15
Culv Nml Depth (m)	1.65	Weir Flow Area (m2)	13.69
Culv Crt Depth (m)	3.19	Min El Weir Flow (m)	64.20

Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section9
Station Elevation Data num= [illegible]

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.67	2.98	68.2	5.87	68	6.64	67.69	6.91	67
7.84	68.66	9.79	66	12.91	65.12	12.62	65	13.04	64.84
13.44	64.68	13.71	64.58	15.22	64	16.14	63.68	17.98	63
19.81	62.33	20.51	62	22.11	61.58	24.07	61	25.71	60.63
26.19	60.54	26.88	60.41	28.58	60.12	28.81	60.08	29.29	60
30.65	59.78	32.04	59.55	32.04	59.47	33.46	59.34	34.44	59.22
34.86	59.15	35	59.13	35.1	59.12	35.34	59	44.06	58.4
47.77	58	47.99	58	54.25	57.06	54.54	57	54.62	57
54.85	57	55.01	57	57.76	56.57	59.26	56.41	60.28	56.22
61.42	56	62.91	56	64.93	56	67.03	56.22	68.59	56.52
71.56	57	75.95	57.6	77.42	57.84	78.11	57.66	82.6	58
91.1	58.71	92.2	58.78	92.7	58.79	95.98	58.98	96.19	59
96.21	59	96.97	59.12	97.13	59.14	97.27	59.14	98.12	59.29
98.4	59.5	98.72	59.31	99.09	59.33	99.54	59.35	102.4	59.75
107.12	60	107.35	60	107.89	60	107.94	60	108.22	60
109.69	60.22	110.51	60.36	111.16	60.46	113.35	60.64	113.9	60.71
114.28	60.75	114.71	60.81	116.43	61	121.21	61.72	124.02	62
124.69	62.1	125.34	62.15	128.26	62.42	128.9	62.48	130.52	62.61
135.61	63	135.94	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.31	145.5	63.34	146.25	63.22	146.9	63.25	147.53	63.08
148.05	63	148.34	63	148.58	63	149.34	63.08	152.17	63.21
154.6	63.3	155.44	63.36	155.92	63.37	159.38	63.3	160.41	63.3
160.98	63.31	161.82	63.33	163.61	63.43	163.95	63.46	165.51	63.52
166.6	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.14	64.5	174.56	64.53	175.07	64.55	175.35	64.61
176.14	64.65	176.85	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.67	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	188.7	65.47	189.42	65.51	190.03	65.53
190.81	65.57	191.31	65.59	196.34	66	196.82	66	196.89	66
197.21	66	198.6	66	201.19	66.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	82.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.77	82.6	87.755	79.88	79.044	.1	.3

CROSS SECTION OUTPUT Profile #1087

			Left OB	Channel	Right OB
E.G. Elev (m)	58.81	Element			
Vel Head (m)	0.60	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	58.21	Reach Len. (m)	87.75	79.88	79.04
Crit W.S. (m)	58.21	Flow Area (m2)	0.21	42.21	0.27
E.G. Slope (m/m)	0.018655	Area (m2)	0.21	42.21	0.27
Q Total (m3/s)	145.09	Flow (m3/s)	0.12	144.82	0.15
Top Width (m)	38.78	Top Width (m)	1.97	34.83	2.54
Vel Total (m/s)	1.40	Avg. Vel. (m/s)	0.55	3.43	1.36
Max Chl Dpth (m)	2.21	Hydr. Depth (m)	0.11	1.21	0.11
Conv. Total (m3/s)	1062.6	Conv. (m3/s)	0.8	1060.1	1.1
Length Wtd. (m)	80.21	Wetted Per. (m)	1.98	36.11	2.55
Min Ch El (m)	56.00	Shear (N/m2)	19.29	219.80	19.14
Alpha	1.02	Stream Power (N/m s)	10.78	754.51	16.74
Frctn Loss (m)	1.44	Cum Volume (1000 m3)	8.35	42.48	12.52
C & E Loss (m)	0.05	Cum SA (1000 m2)	7.22	29.19	14.24

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 not 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS:

INPUT
Description: sections
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	66.94	1.93	66.21	2.09	66.8	2.28	66.79	2.31	66.57
2.74	66.76	3.61	66.48	5.54	66.43	7.71	66.34	11.35	66
18.64	65.27	19.44	65.16	20.21	65.02	20.86	65	22.75	64.84
23.19	64.57	24.18	64.4	24.63	64.33	25	64.26	25.79	64
26.4	63.79	28.41	[illegible]	29.79	62.45	30.85	62	31.87	61.42
32.54	61	33.51	60.[illegible]	34.13	60	34.59	59.72	35.48	59
37.76	58.03	37.82	58	38.13	57.9	38.27	57.85	39.41	57.22
39.85	57	41.28	56.72	41.22	58	43.31	58	43.39	57

43.74	56	44.35	56	51.59	56	52.18	56	57.46	56
58.02	56	58.17	56	58.60	56	59.05	56	60.02	56
60.34	56	60.99	56	61.12	56	80.18	55.3	81.8	55.23
86.4	55.05	87.32	55	88.38	55	90.05	55	93.96	55.63
94.87	55.74	95.24	55.85	96.49	56	98.03	56	98.11	56
103.28	56.32	103.91	56.36	105.56	56.45	113.54	57	115.71	57.53
116.26	57.58	116.52	57.6	116.89	57.63	124.67	58.75	133.02	58.97
133.15	59	133.94	59	134.04	59	134.31	59	137.46	59
139.29	59.04	140.3	59.07	140.32	59.07	141.15	59.12	141.9	59.16
142.17	59.19	142.55	59.24	143.14	59.3	146.7	59.6	147.64	59.75
147.89	59.76	148.79	59.92	149.28	60	150.51	60.17	153.43	60.46
153.97	60.49	154.39	60.51	154.86	60.54	155.36	60.56	155.85	60.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.46	.045	98.03	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.46	98.03	53.379	63.611	75.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	57.04	Element	Left OB	Channel	Right OB
Vel Head (m)	0.57	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	56.47	Reach Len. (m)	53.38	63.61	75.40
Crit W.S. (m)	56.58	Flow Area (m2)	7.10	37.67	1.83
E.G. Slope (m/m)	0.227012	Area (m2)	7.10	37.67	1.83
Q Total (m3/s)	145.04	Flow (m3/s)	12.31	130.71	2.07
Top Width (m)	64.38	Top Width (m)	15.99	40.57	7.82
Vel Total (m/s)	3.11	Avg. Vel. (m/s)	1.73	3.47	1.13
Max Chl Dpth (m)	1.47	Hydr. Depth (m)	0.44	0.93	0.23
Conv. Total (m3/s)	882.8	Conv. (m3/s)	74.9	795.3	12.6
Length Wtd. (m)	61.55	Wetted Per. (m)	16.05	40.67	7.83
Min Ch El (m)	55.00	Shear (N/m2)	117.12	245.32	61.88
Alpha	1.15	Stream Power (N/m s)	203.13	851.31	70.14
Frctn Loss (m)	1.17	Cum Volume (1000 m3)	7.98	38.89	12.83
C & E Loss (m)	0.01	Cum SA (1000 m2)	6.54	26.18	13.82

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 7

INPUT
Description: section7
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.02	.42	63	1.83	62.9	11.65	62.12	13.14	62.01
13.19	62	13.22	61.98	13.24	61.99	15.18	61.69	15.8	61.6
17.69	61.32	19.84	61.06	19.99	61.04	20.34	61	21.32	60.85
21.64	60.79	22.28	60.64	26.06	60	26.39	59.94	28	59.65
28.83	59.5	31.1	59	33.97	58.53	35.38	58	39.91	57.27
41.38	57	42.1	56.87	47.83	56	59.72	55.19	62.4	55
62.87	55	62.72	55	63.87	55	63.92	54.74	64.91	54.59
65.82	54.49	66.09	54.43	66.38	54.38	66.44	54.38	68.65	54.23
76.38	54	78.38	54	80.16	54	81.33	54	81.51	54.12
81.54	54.12	82.07	54.21	82.31	54.42	82.47	54.36	83.22	54.59
83.53	54.51	83.97	54.59	84.74	54.66	91.23	54.48	92.21	54.42
93.43	54.36	100.27	54.07	100.35	54	101.14	53.96	107.7	53.79
108.43	54	110.36	54.55	110.71	54.6	111.08	54.59	111.41	54.59
112.04	54.62	112.83	54.67	115.58	55	115.67	55	115.74	55
117.17	55.16	122.05	55.45	122.48	55.71	122.61	55.73	124.53	56
124.63	56	127.18	56	127.8	56	128.24	55.98	128.25	55.99
128.26	55.99	128.27	55.99	128.28	55.99	129.16	55.95	129.19	55.96
129.22	55.96	129.25	55.96	129.27	55.96	134.63	55.88	134.73	55.88
134.94	55.89	135.05	55.9	135.28	55.9	136.43	55.96		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	86.74	.045	110.36	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
86.74	110.36	77.74	135.126	210.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	55.66	Element	Left OB	Channel	Right OB
Vel Head (m)	0.21	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	55.45	Reach Len. (m)	77.74	135.13	210.39
Crit W.S. (m)	55.53	Flow Area (m2)	35.87	34.37	6.85
E.G. Slope (m/m)	[illegible]	Area (m2)	35.87	34.37	6.85
Q Total (m3/s)	151.14	Flow (m3/s)	56.40	81.42	7.27
Top Width (m)	[illegible]	Top Width (m)	33.68	23.62	11.63
Vel Total (m/s)	1.45	Avg. Vel. (m/s)	1.57	2.37	1.06

Max Chl Dpth (m)	1.65	Hydr. Depth (m)	1.58	1.46	0.59
Conv. Total (m3/s)	1741.4	Conv. (m3/s)	476.9	377.2	87.3
Length Wtd. (m)	125.94	Wetted Per. (m)	33.93	23.75	11.69
Min Ch El (m)	53.74	Shear (N/m2)	71.98	98.52	39.82
Alpha	1.18	Stream Power (N/m s)	113.16	233.40	42.77
Frctn Loss (m)	1.38	Cum Volume (1000 m3)	6.83	36.00	12.51
C & E Loss (m)	0.01	Cum SA (1000 m2)	5.21	24.14	13.08

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

CROSS SECTION

RIVER: 1
REACH: 1 RS: 6

INPUT
Description: section6
Station Elevation Data num= 227

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.56	.2	59.22	1.41	59.3	1.71	59.24	2.93	59
3.16	58.86	4.38	58.71	7.02	58.29	8.75	58	9.06	57.32
9.16	57.89	10.42	57.21	10.73	57.44	13.72	57	15.37	56.7
20.88	56	22.55	55.76	22.7	55.73	22.83	55.71	22.98	55.68
23.2	55.65	23.47	55.61	23.86	55.57	24.32	55.54	24.72	55.53
25	55.5	25.37	55.5	25.9	55.47	26.62	55.39	27.29	55.32
28.19	55.22	29.18	55.09	30.23	55	30.53	54.97	30.57	54.97
31.69	54.97	32.54	54.82	33.11	54.8	33.65	54.78	34.31	54.75
37.11	54.65	37.91	54.62	38.53	54.59	39.07	54.58	39.59	54.56
40	54.54	40.39	54.5	40.86	54.48	41.29	54.44	42.46	54.36
42.61	54.33	43.14	54.3	43.44	54.29	43.77	54.29	43.98	54.28
44.19	54.28	44.58	54.27	44.86	54.27	56.19	54.01	56.2	54.01
56.21	54.01	56.22	54.01	56.23	54.01	56.24	54.01	56.25	54.01
56.26	54.01	58.4	54	62.63	53.83	62.78	53.82	62.93	53.82
63.09	53.81	65.85	53.64	66.15	53.7	67.77	53.6	72.69	53.62
73.28	53.6	75.93	53.66	76.63	53.63	77.12	53.61	77.43	53.59
81.12	53.65	98.72	53	108.13	53	111.58	53	111.82	53
113.29	53	113.95	53	115.34	53	116.78	53	120.85	53
125.12	53.36	126.34	53.45	130.03	53.74	133.58	53.98	133.82	54
133.84	54	133.96	54	148.84	54.39	149.02	54.42	153.27	54.35
153.46	54.37	154.02	54.36	155.44	54.28	155.56	54.29	156.1	54.26
158.58	54	158.9	54	158.82	54	158.9	54	162.42	54.46
167.23	55	167.64	55	167.69	55	167.73	55	168.54	55
168.64	55	169.43	55	169.54	55	169.68	55	170.46	55
170.6	55	170.72	55	171.43	55	171.6	55	171.78	55
172.19	55	172.36	55	172.64	55	173.38	55	173.54	55
173.68	55	173.85	55	181.83	55.53	204.25	55.8	207.94	55.9
208.08	55.9	208.45	55.91	208.57	55.91	211.31	56	211.68	56.28
212.56	57	213.35	57.67	213.84	58	214.23	58.34	215.08	59
216.29	59.32	216.39	60	216.47	60.07	216.69	60.24	217.05	61
218.22	61.42	218.45	62	219.58	62.52	220.26	63	220.97	63.54
221.81	64	222.81	64.95	222.87	65	222.98	65.06	223.1	65.17
224.29	66	224.89	66.44	225.59	67	226.46	67.62	226.9	68
229.3	68.42	233.9	69	236.12	69.26	236.46	69.3	236.89	69.33
237.46	69.38	238.23	69.45	239.16	69.54	240.25	69.64	241.26	69.73
242.54	69.85	244.26	70	244.42	70	244.51	70	247.74	70.17
248.86	70.22	249.25	70.27	250.17	70.29	251.34	70.36	251.78	70.39
252.49	70.43	253.2	70.49	254.82	71	262.3	71	262.66	71
263.01	71	268.55	71	269.95	71	268.91	71	269.59	71
270.56	71	271.45	71	272.61	71	275.53	71	279.24	71
279.82	70.9	279.93	70.88	280.47	70.82	280.58	70.78	281.31	70.71
281.66	70.63	282.22	70.62	283.88	70.27	284.47	70.18	285.45	70.11
285.6	70.09	286.31	70.1	286.4	70.09	286.48	70.1	287.18	70.13
287.65	70.21	288.63	70.31	289.17	70.45	289.48	70.55	292.36	71
294.64	71.18	294.73	71.19	295.41	71.26	296.5	71.3	297.53	71.36
298.06	71.37	298.[illegible]	71.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	80.33	.045	181.83	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
80.33	181.83	60.388	113.83	209.388	.1	.3

CROSS SECTION OUTPUT Profile #100

			Left OB	Channel	Right OB
E.G. Elev (m)	71.[illegible]	Element			
Vel Head (m)	[illegible]	Wt. n-Val.		0.045	
W.S. Elev (m)	54.[illegible]	Reach Len. (m)	60.35	113.83	209.38
Crit W.S. (m)	54.[illegible]	Flow Area (m2)		63.99	
E.G. Slope (m/m)	[illegible]	Area (m2)		63.99	
Q Total (m3/s)	149.[illegible]	Flow (m3/s)		149.19	
Top Width (m)	97.[illegible]	Top Width (m)		97.24	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		2.[illegible]	

Max Chl Dpth (m)	1.20	Hydr. Depth (m)		0.66		
Conv. Total (m3/s)	1075.1	Conv. (m3/s)		1075.1		
Length Wtd. (m)	125.17	Wetted Per. (m)		97.33		
Min Ch El (m)	53.00	Shear (N/m2)		124.15		
Alpha	1.00	Stream Power (N/m s)		289.47		
Frctn Loss (m)	0.60	Cum Volume (1000 m3)	5.44	29.96	11.78	
C & E Loss (m)	0.06	Cum SA (1000 m2)	3.90	15.98	11.86	

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 5

INPUT
Description: section5
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.08	.18	58	1.56	57.42	2.57	57	4.31	56.28
5.03	56	6.07	55.56	6.25	55.49	6.49	55.39	6.82	55.26
7.26	55.07	7.43	55	8.26	54.63	9.03	54.28	9.27	54.17
9.66	54	9.83	53.93	10.04	53.84	11.76	53	13.65	52.13
13.91	52	15.45	52	16.13	52	24.4	52	24.73	52
25.07	52	25.82	52	29.82	52	30.51	51.65	32.1	51
33.57	51	33.85	51	34.2	51	35.85	51.21	39.43	51.6
40.39	51.69	40.84	51.79	41.72	51.8	42.48	51.87	42.59	51.88
42.98	51.9	43.97	51.91	43.14	51.92	44.16	51.95	44.29	51.95
44.33	51.96	45.09	51.96	45.2	51.96	46.95	52	48.27	52
49.16	52	49.33	52	50.91	52	51.11	52	51.9	52
54.02	52	55.2	52	55.62	52	56.39	52	56.88	52
59.4	52	74.85	52.84	75.33	52.86	76.34	52.89	76.55	52.9
78.04	52.94	78.32	52.96	78.57	52.96	79.41	53	79.51	53
80.32	53	80.39	53	81.82	53	84.33	53	84.45	53
84.71	53	86.91	53	87.72	53	88.49	53	92.48	53
94.23	53	95.17	53	96.06	53.07	96.65	53.08	99.21	53.16
99.91	53.19	100.35	53.18	102.69	53.26	103.15	53.26	109.86	53.42
110.07	53.43	120.68	53.4						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	29.82	.045	44.16	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.82	44.16	120.278	71.551	24.002	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	55.82	Element	Left OB	Channel	Right OB
Vel Head (m)	0.39	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	55.43	Reach Len. (m)	120.28	71.55	24.00
Crit W.S. (m)		Flow Area (m2)	30.67	32.62	70.08
E.G. Slope (m/m)	0.002139	Area (m2)	30.67	32.62	70.08
Q Total (m3/s)	1243.19	Flow (m3/s)	34.37	57.31	57.51
Top Width (m)	106.54	Top Width (m)	19.55	14.34	72.65
Vel Total (m/s)	1.12	Avg. Vel. (m/s)	1.12	1.76	0.82
Max Chl Dpth (m)	1.77	Hydr. Depth (m)	1.57	2.28	0.96
Conv. Total (m3/s)	1225.4	Conv. (m3/s)	743.1	1239.1	1243.4
Length Wtd. (m)	65.73	Wetted Per. (m)	19.34	14.60	72.69
Min Ch El (m)	51.00	Shear (N/m2)	32.27	46.88	20.22
Alpha	1.19	Stream Power (N/m s)	36.16	82.35	16.60
Frctn Loss (m)	0.10	Cum Volume (1000 m3)	4.82	24.36	4.45
C & E Loss (m)	0.00	Cum SA (1000 m2)	3.51	9.51	4.26

CROSS SECTION

RIVER: 1
REACH: 1 RS: 4

INPUT
Description: section4
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.04	.51	57	1.13	57	2.32	57	4	57
6.96	57	11.65	56.2	13.07	56	14.07	55.83	14.24	55.8
16.48	55.16	14.8	55.7	15.11	55.64	16.11	55.49	16.72	55.38
17.82	55.19	18.08	55.11	18.7	55.01	18.73	55	19.81	54.78
20.94	54.51	21.07	54.4	21.1	54.25	22.41	54.18	22.61	54.14
22.71	54.11	23.21	4	23.71	53.19	27.6	53	29.03	52.71

30.25	52.4	31.09	52	32.05	52	32.11	52	37.67	51.59		
45.67	51	50.44	51	51.66	51	51.88	51	52.17	51		
61.96	51.33	64.49	51.41	66.37	51.47	74.50	51.68	82.76	51.86		
82.88	51.86	88.93	52	87.97	52.07	88.93	52.16	94.66	52.63		
98.58	53	102.7	53.35	104.95	54	111.33	54.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	37.67	.045	74.58	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
37.67	74.58	67.853	54.387	41.471	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	53.71	Element	Left OB	Channel	Right OB
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.63	Reach Len. (m)	67.85	54.39	41.47
Crit W.S. (m)		Flow Area (m2)	18.24	86.76	38.11
E.G. Slope (m/m)	0.001205	Area (m2)	18.24	86.76	38.11
Q Total (m3/s)	197.31	Flow (m3/s)	11.84	118.27	27.40
Top Width (m)	31.07	Top Width (m)	12.88	36.31	31.28
Vel Total (m/s)	1.12	Avg. Vel. (m/s)	0.73	1.36	0.72
Max Chl Dpth (m)	2.63	Hydr. Depth (m)	1.26	2.35	1.22
Conv. Total (m3/s)	4516.3	Conv. (m3/s)	341.0	3406.3	789.1
Length Wtd. (m)	53.23	Wetted Per. (m)	13.09	36.94	31.35
Min Ch El (m)	51.30	Shear (N/m2)	14.67	27.76	14.37
Alpha	1.22	Stream Power (N/m s)	10.70	37.84	10.33
Frctn Loss (m)	2.32	Cum Volume (1000 m3)	2.00	20.39	5.15
C & E Loss (m)	2.62	Cum SA (1000 m2)	1.56	7.68	1.01

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: sections
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.34	.19	[illegible]	3.07	56.14	3.42	56	[illegible]	[illegible]
5.77	55	7.89	54.1	9.03	54.04	8.11	54	9.41	53.67
10.44	53	11.61	52.02	13.62	52	15.47	51.89	16.02	51.16
17.45	51.77	18.59	51.7	22.98	51.44	35.58	51	38.18	51
38.23	51	38.44	51	48.77	51	54.38	51	55.38	51
55.37	51	55.58	51	56.33	51	58.78	51	59.24	51
59.3	51	59.69	51	63.73	51	68.82	51	68.54	51
70.93	51	73.61	51	85.07	51	92.61	51	94.8	51
97.75	51	98.15	51	101.86	51	103.46	51	103.48	51
103.54	51	114.24	51.74	114.61	51.82	117.11	52	125.17	52.[illegible]

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	15.47	.045	114.24	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.47	114.24	27.569	41.901	57.982	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	51.27	Element	Left OB	Channel	Right OB
Vel Head (m)	1.02	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	50.25	Reach Len. (m)	27.56	41.90	57.30
Crit W.S. (m)		Flow Area (m2)	5.53	144.93	15.57
E.G. Slope (m/m)	0.[illegible]	Area (m2)	7.35	148.93	17.77
Q Total (m3/s)	180.40	Flow (m3/s)	2.07	153.03	25.30
Top Width (m)	[illegible]	Top Width (m)	6.55	48.77	12.31
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)	0.39	1.01	0.33
Max Chl Dpth (m)	[illegible]	Hydr. Depth (m)	1.12	3.53	1.44
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)	139.7	10479.7	790.2
Length Wtd. (m)	[illegible]	Wetted Per. (m)	6.54	48.82	13.39
Min Ch El (m)	[illegible]	Shear (N/m2)	2.32	1.46	2.87
Alpha	1.38	Stream Power (N/m s)	0.65	5.35	0.93
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)	1.70	12.93	1.65
C & E Loss (m)	[illegible]	Cum SA (1000 m2)	0.90	3.95	1.28

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 2

INPUT
Description: section2
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57	.32	57	.77	57	1.39	57	3.81	57
4.27	57	9.19	57	12.85	56.37	14.4	56.03	14.44	56.02
14.47	56.01	14.53	56	14.62	55.98	14.63	55.98	18.83	55
22.37	54.15	22.99	54	23.66	53.86	27.47	53	29.51	52.53
30.38	52.34	31.44	52.13	32.15	52	37.1	51.47	42.18	51
42.2	51	42.85	51	43	51	43.63	51	43.88	51
49.58	50.64	52.14	50.53	53.18	50.47	53.86	50.43	54.91	50.37
56.13	50.3	57.55	50.22	57.89	50.2	60.18	50.08	61.63	50
62.58	50	63.48	50	64.02	50	64.57	50	65.55	50.13
66.57	50.26	72.83	51	73.2	51	73.57	51.1	74.62	51.37
75.07	51.5	77.22	52	79.33	52.45	80.89	52.72	82.26	53
82.39	53.02	87.13	54	87.2	54.01	90.74	54.17	93.73	54.13
94.77	54	95.91	53.75	99.75	53	102.58	53	103.97	53
104.51	53.09	104.89	53.17	110.3	54	113.61	54.63	113.87	54.69
114.3	54.75	115.14	54.85	116.24	55	116.27	55	118.65	55.28
120	55.44	120.87	55.56	121.68	55.66	122.27	55.73	124.34	56
124.85	56.06	125.05	56.09	125.98	56.23	126.67	56.33		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	42.85	.045	72.83	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
42.85	72.83	30.000	48.691	69.949	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	53.65	Element			
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.58	Reach Len. (m)	30.01	48.69	69.95
Crit W.S. (m)		Flow Area (m2)	28.37	92.93	19.41
E.G. Slope (m/m)	0.000876	Area (m2)	28.37	92.93	19.41
Q Total (m3/s)	160.00	Flow (m3/s)	20.61	129.70	10.59
Top Width (m)	70.62	Top Width (m)	17.87	29.98	22.77
Vel Total (m/s)	1.14	Avg. Vel. (m/s)	0.73	1.40	0.55
Max Chl Dpth (m)	1.58	Hydr. Depth (m)	1.59	3.10	0.85
Conv. Total (m3/s)	5419.9	Conv. (m3/s)	696.2	4381.8	357.8
Length Wtd. (m)	47.54	Wetted Per. (m)	18.09	30.07	23.15
Min Ch El (m)	52.00	Shear (N/m2)	13.47	26.55	7.20
Alpha	1.27	Stream Power (N/m s)	9.79	37.06	3.93
Frctn Loss (m)	2.37	Cum Volume (1000 m3)	6.71	3.75	0.93
C & E Loss (m)	0.01	Cum SA (1000 m2)	0.56	1.29	1.10

Warning: Divided flow computed for this cross-section.
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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 1

INPUT
Description: section1
Station Elevation Data num= 123

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.42	3.84	56.45	4.14	56.5	4.58	56.42	5.78	56.48
7.18	56.46	8.07	56.5	11.37	56.51	14.08	56.45	16.74	56.31
16.84	56.3	20.18	56	24.19	55.67	24.29	55.63	24.62	55.59
24.97	55.55	25.46	55.48	26.08	55.4	26.34	55.34	27.16	55.24
28.26	55.12	28.33	55.1	28.31	55	29.48	54.98	30.49	54.82
30.64	54.77	31.22	54.42	33.21	54.14	33.36	54.1	33.74	54
34.92	53.79	37.14	53.46	40.19	53	40.99	52.88	41.16	52.84
42	52.68	42.33	52.62	43.56	52.38	44.19	52.33	44.51	52.28
44.72	52.25	44.99	52.24	45.08	52.23	47.89	52.21	51.22	52.22
51.83	52.15	54.87	52	57.36	52	58.06	52	58.25	52
58.44	52	58.89	52	59.26	52	59.59	52	60.11	51.7
61.63	51	63.23	50.12	63.48	50	63.85	50	64.06	50
64.95	50	66.69	50	68.28	50	69.48	50.1	78.08	51
79.25	51.38	85.48	51.91	86.69	52	87.85	52.91	88.69	53
88.83	53.12	89.93	54	90.83	54.89	90.93	55	91.41	55.19
91.89	55.38	92.19	55.5	94.2	56	95.67	56.32	98.65	57
100.54	57.43	103.19	58	104.83	58.4	107.56	59	108.36	59.19
108.59	59.24	108.78	59.27	109.01	59.32	109.31	59.38	110.04	59.52
111.42	59.78	112.5	60	113.42	60.18	116.96	61	117.48	61.14
121.17	62	123.15	62.49	125.63	63	127.61	63.44	130.24	64
131.98	64.46	132.05	64.47	132.28	64.5	132.6	64.7	133.58	65
133.98	65.11	136.23	65.73	136.68	65.83	137.25	65.99	137.26	65.99
137.27	65.99	137.32	66	137.44	66	138.34	66.15	140.24	66.38
140.47	66.41	141.22	66.51	143.9	66.75	146.56	67	148.17	67.13

148.19	67.15	156	67.1	153.68	67.69

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.36	.045	80.48	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.36	80.48		0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	53.56	Element	Left OB	Channel	Right OB
Vel Head (m)	0.22	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.44	Reach Len. (m)			
Crit W.S. (m)	52.12	Flow Area (m2)	18.88	61.10	7.07
E.G. Slope (m/m)	0.002398	Area (m2)	18.88	61.10	7.07
Q Total (m3/s)	169.90	Flow (m3/s)	18.08	136.85	5.97
Top Width (m)	51.17	Top Width (m)	19.42	23.12	8.63
Vel Total (m/s)	1.85	Avg. Vel. (m/s)	0.96	2.24	0.84
Max Chl Dpth (m)	3.44	Hydr. Depth (m)	0.97	2.64	0.82
Conv. Total (m3/s)	2988.5	Conv. (m3/s)	335.8	2542.1	110.9
Length Wtd. (m)		Wetted Per. (m)	19.52	23.85	8.83
Min Ch El (m)	50.00	Shear (N/m2)	27.49	72.80	22.76
Alpha	1.29	Stream Power (N/m s)	26.32	163.06	19.22
Frctn Loss (m)		Cum Volume (1000 m3)			
C & E Loss (m)		Cum SA (1000 m2)			

SUMMARY OF MANNING'S N VALUES

River:1

Reach	River Sta.	n1	n2	n3
1	20	.055	.045	.055
1	19	.055	.045	.055
1	18	.055	.045	.055
1	17	.055	.045	.055
1	16	.055	.045	.055
1	15	.055	.045	.055
1	14	.055	.045	.055
1	13	.055	.045	.055
1	12	.055	.045	.055
1	11	.055	.045	.055
1	10	.055	.045	.055
1	9.5	Culvert		
1	9	.055	.045	.055
1	8	.055	.045	.055
1	7	.055	.045	.055
1	6	.055	.045	.055
1	5	.055	.045	.055
1	4	.055	.045	.055
1	3	.055	.045	.055
1	2	.055	.045	.055
1	1	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: 1

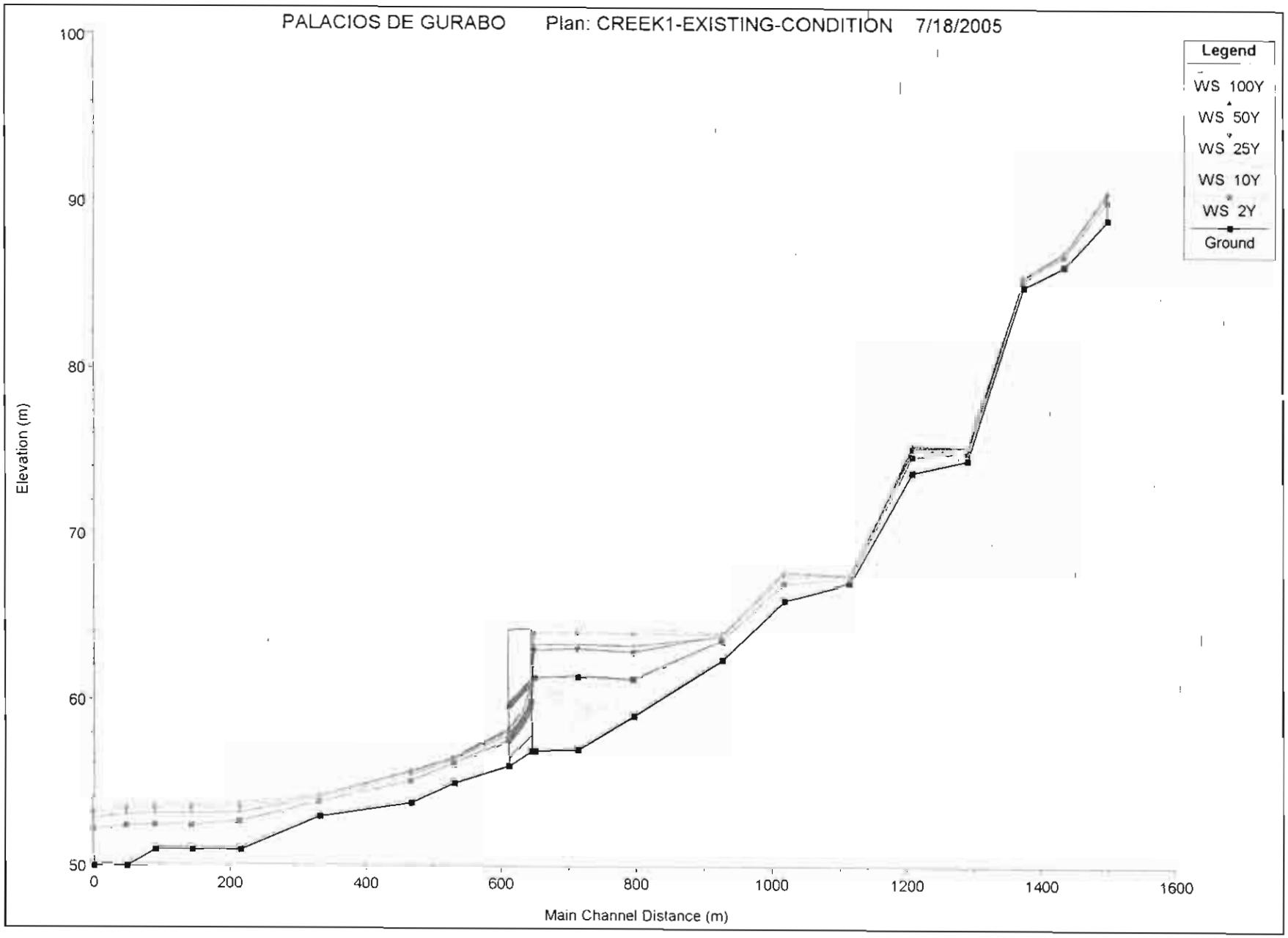
Reach	River Sta.	Left	Channel	Right
1	20	64.181	64.686	67.416
1	19	68.635	68.564	70.963
1	18	82.008	83.075	83.193
1	17	83.254	82.13	81.5
1	16	148.1	82.89	79.966
1	15	101.058	96.893	81.927
1	14	87.1	91.834	84.207
1	13	73.04	131.422	181.556
1	12	46.219	83.106	120.746
1	11	44.201	43.23	72.565
1	10	50.272	49.111	28.313
1	9.5	Culvert		
1	9	37.755	39.88	79.044
1	8	53.574	63.631	75.395
1	7	77.74	135.126	218.385
1	6	40.348	135.83	203.385
1	5	120.276	71.552	28.002
1	4	47.953	54.387	41.471
1	3	27.468	41.901	57.302
1	2	30.008	48.692	69.334
1	1	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1

Reach	River Sta.	Contr.	Expan.
1	20	.1	.3
1	19	.1	.3
1	18	.1	.3
1	17	.1	.3
1	16	.1	.3
1	15	.1	.3
1	14	.1	.3
1	13	.1	.3
1	12	.1	.3
1	11	.1	.3
1	10	.1	.3
1	9.5	Culvert	
1	9	.1	.3
1	8	.1	.3
1	7	.1	.3
1	6	.1	.3
1	5	.1	.3
1	4	.1	.3
1	3	.1	.3
1	2	.1	.3
1	1	.1	.3

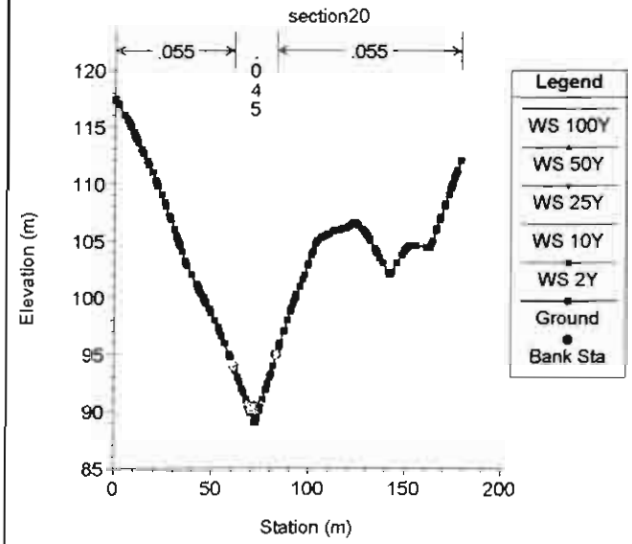
Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	20	100Y	21.97	89.00	90.71	90.72	91.21	0.023721	3.09	7.12	7.47	1.01
1	19	100Y	21.97	86.17	87.08	87.42	88.20	0.121247	4.67	4.70	9.76	2.15
1	18	100Y	21.97	84.92	85.57	85.57	85.78	0.027325	2.03	10.80	26.11	1.01
1	17	100Y	41.85	74.44	75.25	75.88	78.06	0.274874	7.44	5.60	10.81	3.30
1	16	100Y	83.02	73.70	75.34	75.34	75.92	0.017675	3.38	25.15	23.33	0.97
1	15	100Y	85.37	67.00	67.49	68.15	71.05	0.433187	8.36	10.21	23.55	4.05
1	14	100Y	85.37	65.98	67.73	67.73	68.30	0.019875	3.36	25.40	22.28	1.00
1	13	100Y	85.37	62.40	63.93	64.29	65.06	0.076692	4.98	18.87	28.33	1.85
1	12	100Y	85.37	59.00	64.30	62.38	64.41	0.001168	1.53	66.22	35.12	0.27
1	11	100Y	145.09	57.00	64.36		64.37	0.000066	0.63	340.98	72.99	0.08
1	10	100Y	145.09	56.92	64.33	61.32	64.36	0.000220	0.91	247.66	92.12	0.12
1	9.5		Culvert									
1	9	100Y	145.09	56.00	58.21	58.21	58.81	0.018655	3.43	42.69	39.34	0.99
1	8	100Y	145.09	55.00	56.47	56.59	57.04	0.027012	3.47	46.59	64.38	1.15
1	7	100Y	145.09	53.79	55.64	55.23	55.86	0.006942	2.37	77.09	68.93	0.63
1	6	100Y	149.19	53.00	54.20	54.15	54.48	0.019258	2.33	63.99	97.24	0.92
1	5	100Y	149.19	51.00	53.77		53.82	0.002139	1.76	133.37	106.54	0.37
1	4	100Y	157.31	51.00	53.63		53.71	0.001205	1.36	141.11	81.07	0.28
1	3	100Y	160.90	51.00	53.65		53.67	0.000220	0.61	275.03	117.65	0.12
1	2	100Y	160.90	50.00	53.56		53.65	0.000876	1.40	140.71	70.62	0.25
1	1	100Y	160.90	50.00	53.34	52.52	53.56	0.002898	2.24	87.06	51.17	0.44


PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005
Legend
WS 100Y
WS 50Y
WS 25Y
WS 10Y
WS 2Y
Ground
Elevation (m)
100
90
80
70
60
50
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (m)

PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section20



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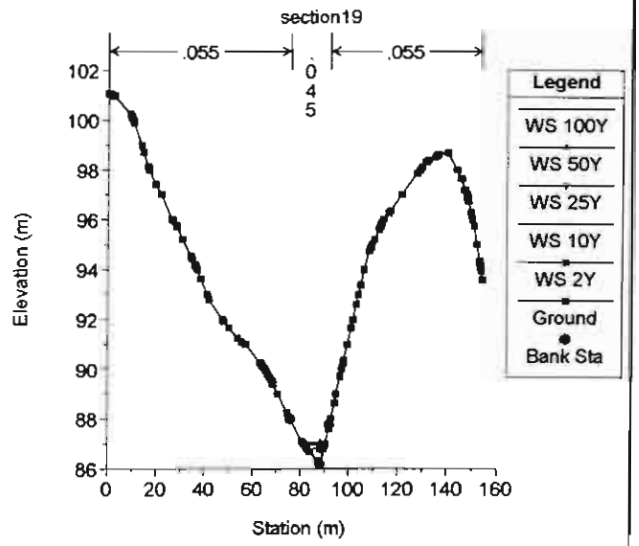
section19



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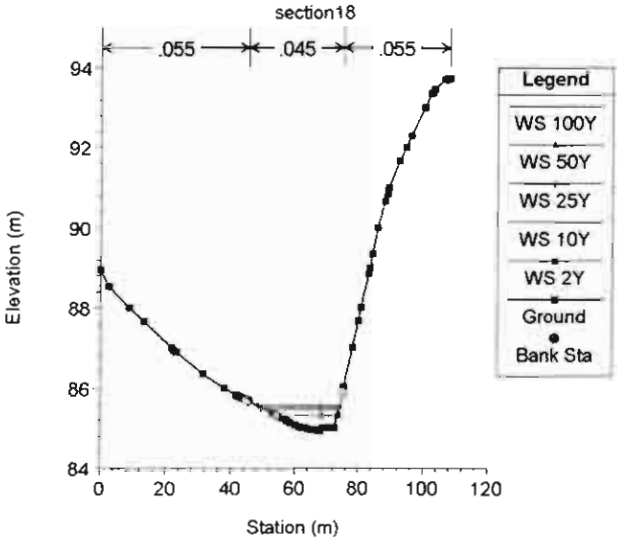
section18



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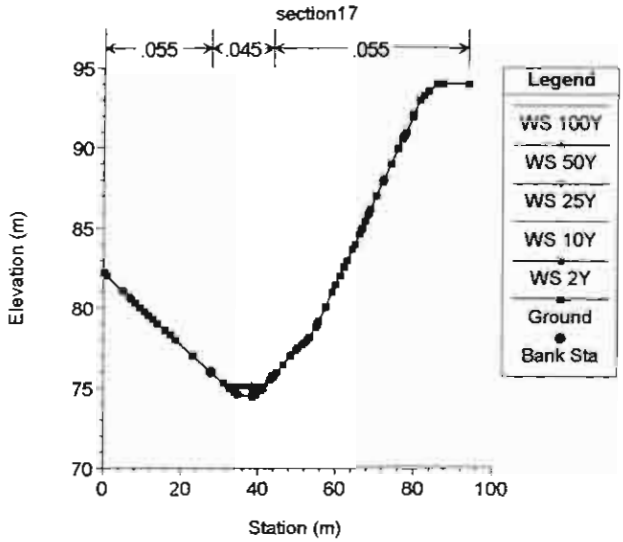
section17



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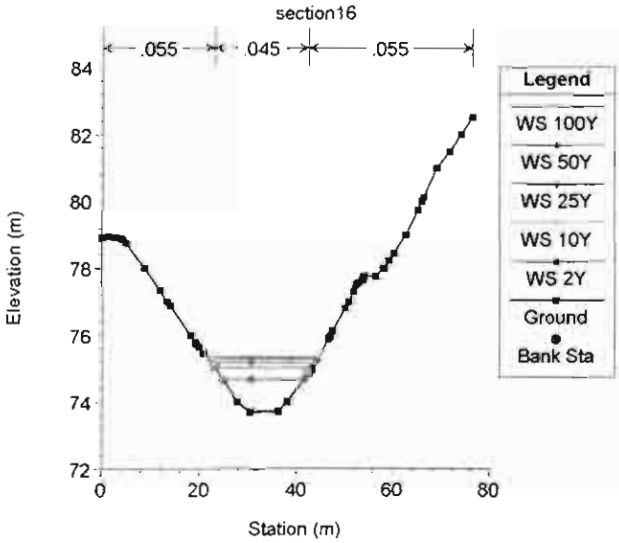

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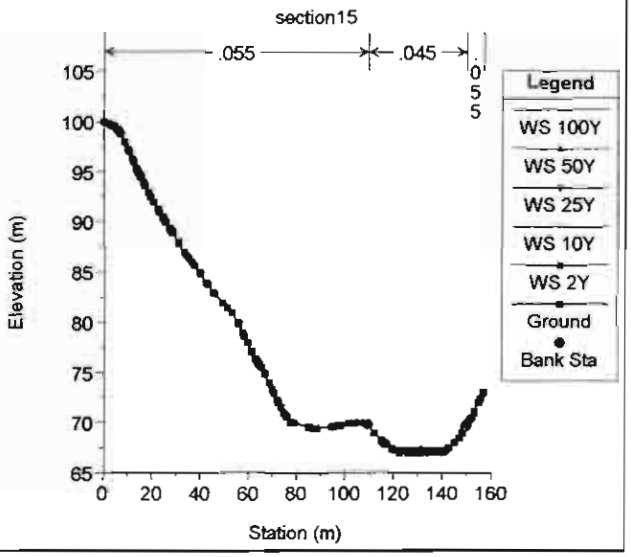
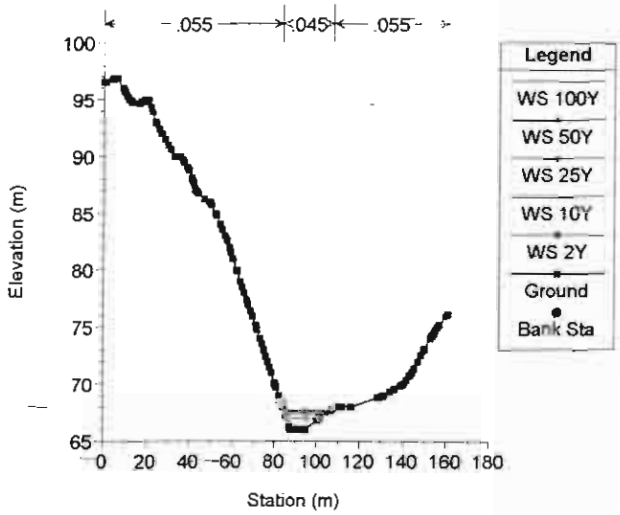
section15



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section14



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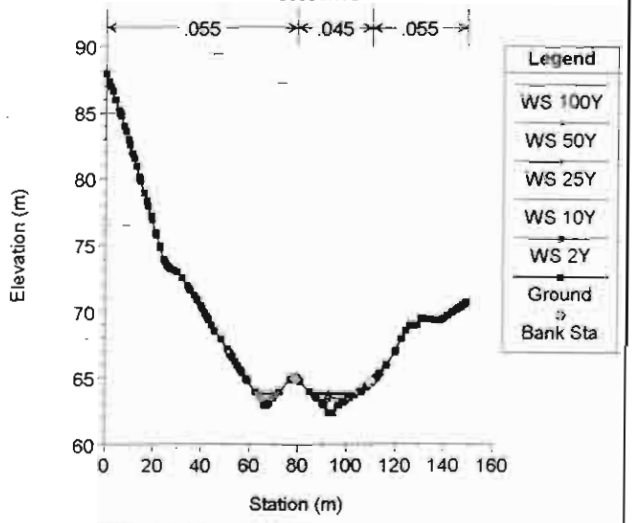

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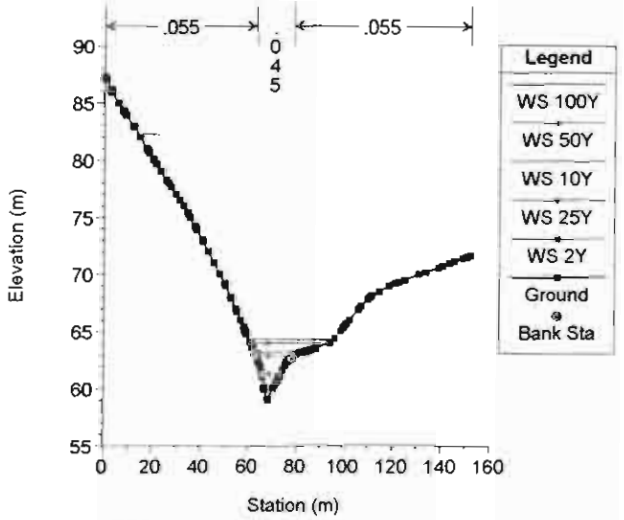
section12



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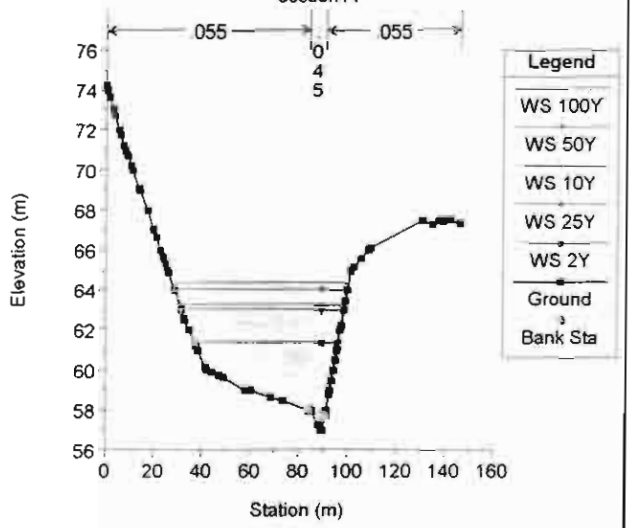
section11



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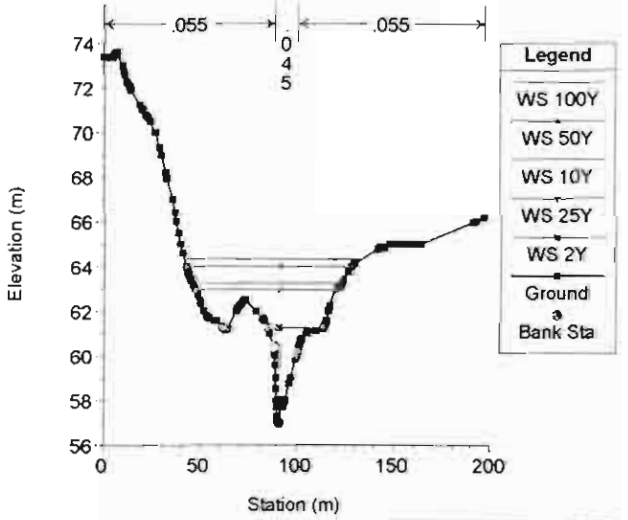
section10



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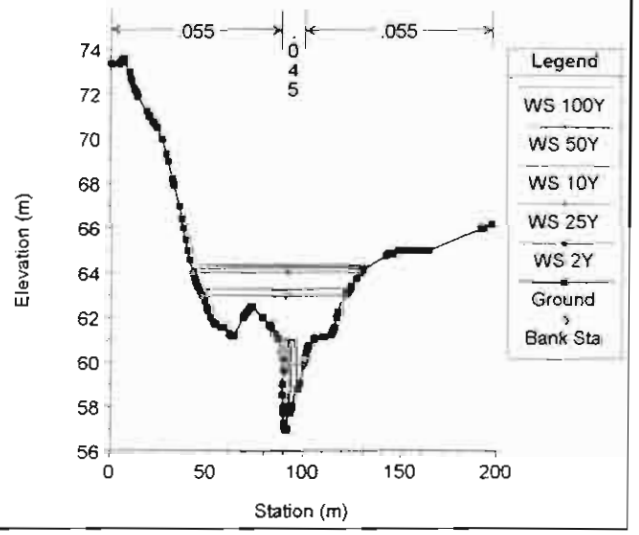
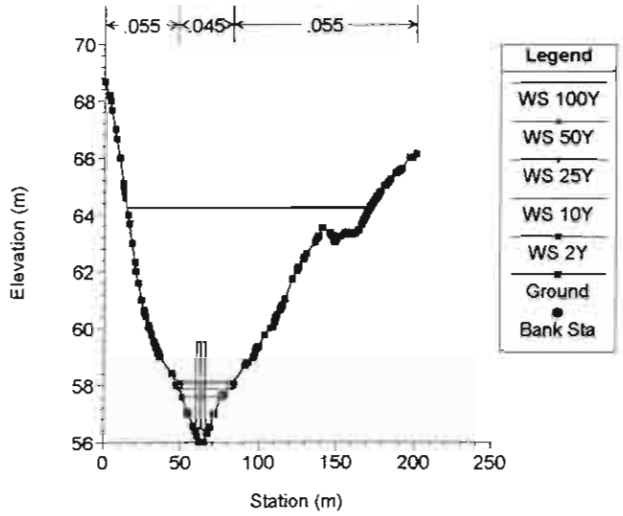
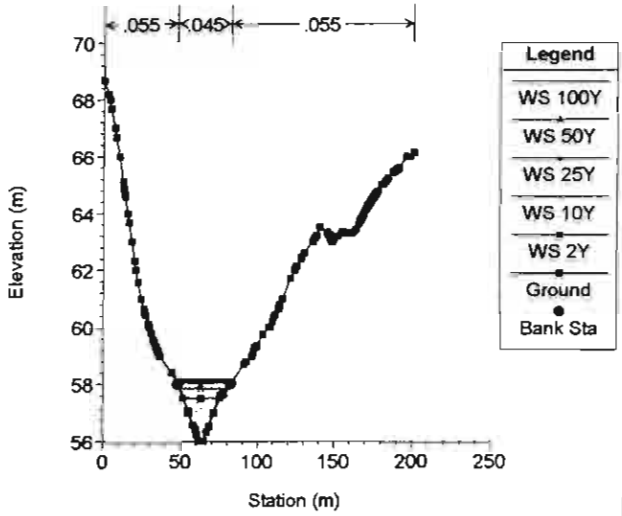


PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section9



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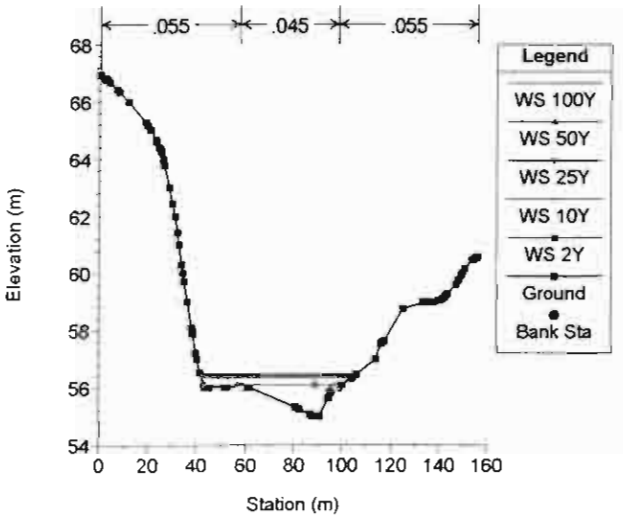
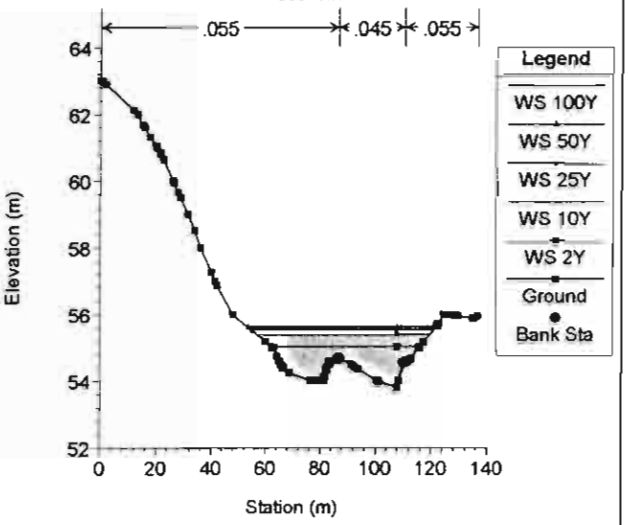
section8



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section7



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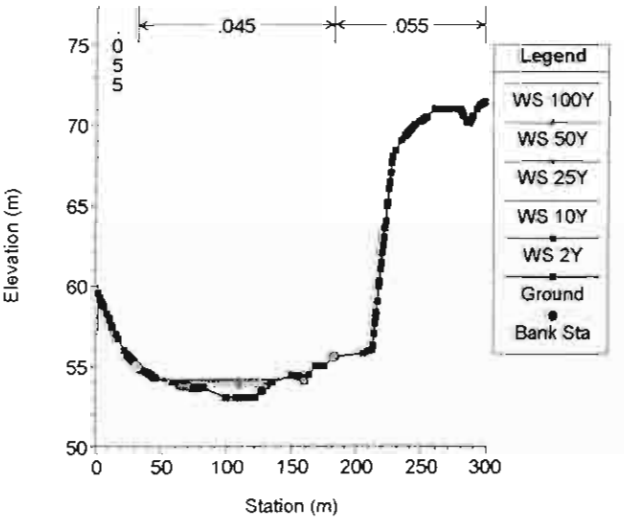

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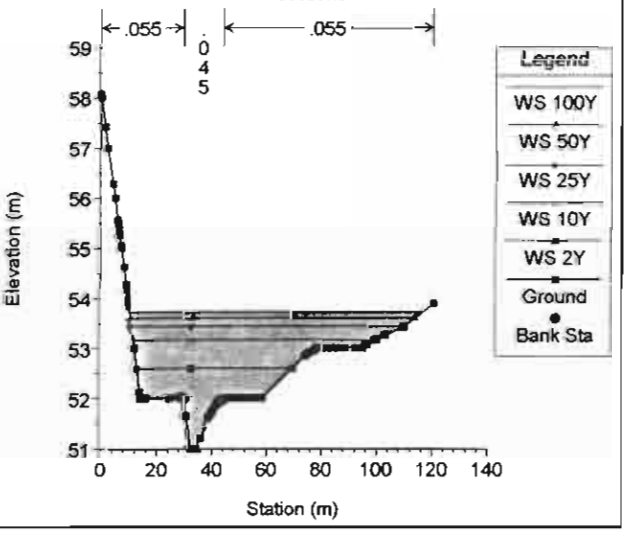
section5



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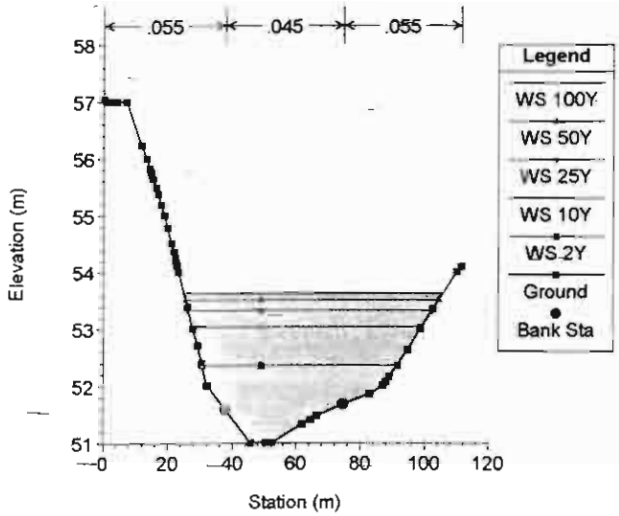
section4



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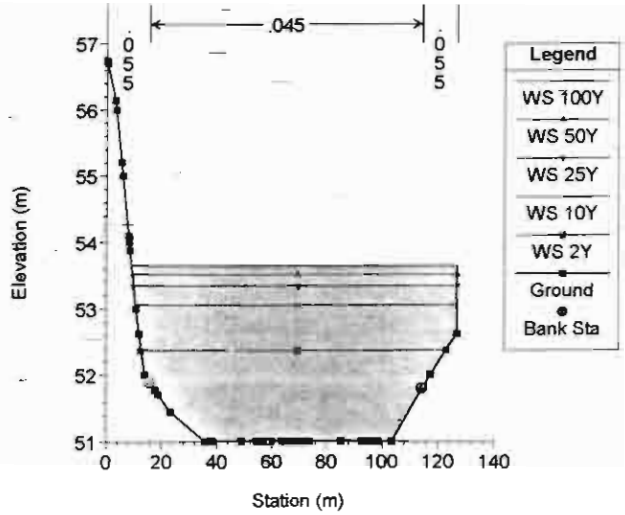

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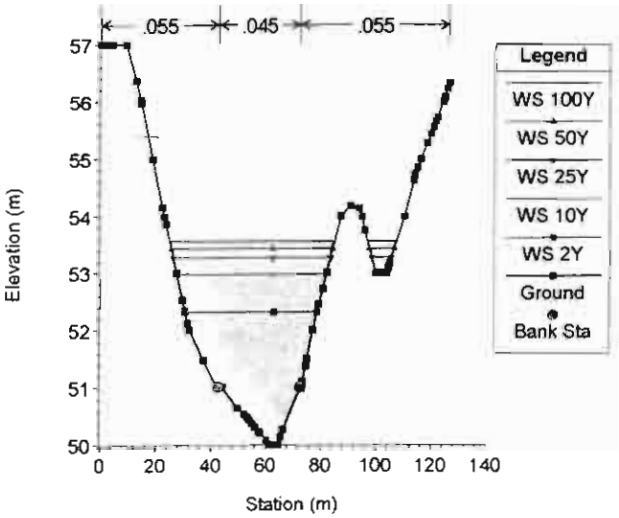
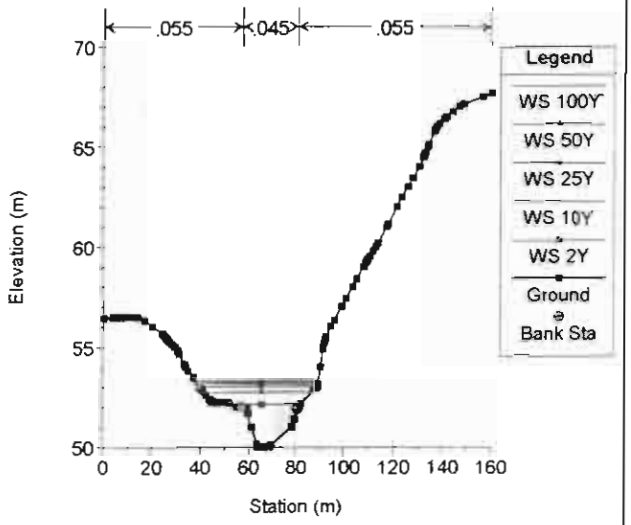
section2



PALACIOS DE GURABO Plan: CREEK1-EXISTING-CONDITION 7/18/2005

section1



HEC-RAS Version 3.1.1 May 2003
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
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PROJECT DATA
Project Title: PALACIOS DE GURABO
Project File : CREEK1.prj
Run Date and Time: 7/18/2005 1:45:02 PM

Project in SI units

PLAN DATA

Plan Title: CREEK2-EXISTING-CONDITION
Plan File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.p01

Geometry Title: CREEK2-EXISTING-CONDITION
Geometry File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.g02

Flow Title : CREEK2-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f02

Plan Summary Information:

Number of:	Cross Sections =	10	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	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: Mixed Flow

FLOW DATA

Flow Title: CREEK2-EXISTING-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f02

Flow Data (m3/s)

River	Reach	RS	100Y	50Y	25Y	10Y	2Y
2	1	30	10.49	9.58	8.42	6.66	3.6
2	1	29	16.16	14.77	13.01	10.35	5.7
2	1	22	32.34	29.42	25.68	19.93	10.29

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
2	1	100Y	Critical	Normal S = 0.008
2	1	50Y	Critical	Normal S = 0.008
2	1	25Y	Critical	Normal S = 0.008
2	1	10Y	Critical	Normal S = 0.008
2	1	2Y	Critical	Normal S = 0.008

GEOMETRY DATA

Geometry Title: CREEK2-EXISTING-CONDITION
Geometry File : p:\270-Palacios to Urban\HEC-RAS\CREEK1.g02

CROSS SECTION

RIVER: 2
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78.29	3.31	78.15	4.07	78.13	6.28	78	9.08	77.82
15.33	77.42	16.46	77.1	16.27	77.39	17.12	77.34	17.48	77.32
20.73	77.03	21.09	77	22.12	76.87	24.26	76.61	24.91	76.23
25.37	76.47	31.07	76	33.01	75.7	34.15	75.67	34.46	75.65
34.81	75.63	35.24	75.6	36.29	75.52	36.89	75.49	37.41	75.43
38.1	75.4	38.73	75.37	39.36	75.34	40.2	75.27	41.04	75.24
41.41	75.2	42.39	75.13	45.19	75	45.54	75	46.74	74.72
47.48	74.53	49.36	74	49.59	73.91	51.69	73	52.49	72.73
54.33	72.16	54.83	72	56	71.704	56.69	71.53	58.83	71
61.5	70.35	62.91	70	63.55	70	64.4	70	64.69	70
75.69	70	76.2	70	76.91	70	77.6	70	78.19	70
78.85	70.3	79.57	70.65	80.33	71	80.67	71.15	82.5	72
82.52	72.009	83.91	72.66	84.08	73	86.23	73.71	86.89	74
88.09	74.54	88.54	74.76	89.05	75	89.35	75.14	89.72	75.1
91.29	76	92.79	76.65	93.55	77	94.92	77.63	95.7	78
98.51	78.88	98.81	79	99.59	79.22	99.86	79.28	100.41	79.41
101.84	79.72	103.21	80	104.39	80.26	105.42	80.47	106	80.29
108.23	81	110.18	81.41	111.64	82	112.83	82.54	113.91	83
114.67	83.37	116.03	84	117.07	84.49	117.79	84.83	118.17	85
120.35	85.98	120.38	85.99	120.39	86	120.4	86	120.41	86.11
121.89	86.6								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	54.83	.045	92.52	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
54.83	82.52	42.125	95.547	26.773	.1	.3

CROSS SECTION OUTPUT Profile #100

E.G. Elev (m)	72.53	Element	Left OB	Channel	Right OB
Vel Head (m)	0.00	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	72.53	Reach Len. (m)	42.12	95.55	26.77
Crit W.S. (m)	72.15	Flow Area (m2)	0.43	57.36	0.29
E.G. Slope (m/m)	0.000025	Area (m2)	0.43	57.36	0.29
Q Total (m3/s)	10.49	Flow (m3/s)	0.02	10.46	0.01
Top Width (m)	30.44	Top Width (m)	1.65	27.14	1.10
Vel Total (m/s)	0.10	Avg. Vel. (m/s)	0.04	0.18	0.04
Max Chl Dpth (m)	2.33	Hydr. Depth (m)	0.26	2.12	0.26
Conv. Total (m3/s)	2054.0	Conv. (m3/s)	8.1	2044.1	2.0
Length Wtd. (m)	39.47	Wetted Per. (m)	1.73	28.71	1.12
Min Ch El (m)	70.00	Shear (N/m2)	0.08	0.11	.06
Alpha	1.02	Stream Power (N/m s)	0.00	1.19	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	2.10	12.42	0.48
C & E Loss (m)	0.00	Cum SA (1000 m2)	2.58	19.14	1.17

CROSS SECTION

RIVER: 2
REACH: 1 RS: [illegible]

INPUT
Description: section9
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	77	2.93	[illegible]	3.51	77	7.34	76.91	7.91	[illegible]
8.95	76.81	9.55	[illegible]	9.76	76.62	12.52	76.38	12.65	[illegible]
13.26	76.23	13.49	[illegible]	16.72	76.39	19.31	76	19.76	[illegible]
20.42	76	21.32	76	22.12	76	23.07	76	23.45	[illegible]
24.42	75.82	25.42	[illegible]	27.11	75	27.86	74.88	28	74.74
29.19	74.64	29.82	[illegible]	30.28	74.49	30.52	74.43	31.22	[illegible]
31.5	74.36	31.81	[illegible]	32.11	74.3	32.32	74.28	32.33	[illegible]
32.45	74.25	32.64	[illegible]	37.74	70.83	38.85	70.44	40.12	[illegible]
42.34	70.32	43.43	[illegible]	44.56	71.51	44.88	71.66	45.33	[illegible]
46.4	72.03	46.47	[illegible]	48.28	72.18	49.64	72	50.53	[illegible]
50.79	71.55	51.45	[illegible]	52.07	71.82	52.18	71.81	54.08	[illegible]
54.11	72	54.57	72	54.67	72	55.08	72	56.86	72
57.22	72	57.23	72	58.85	72.45	60.38	72.61	61.56	[illegible]
61.68	72.65	62.32	[illegible]	64.17	73.34	65.32	73.59	66.2	[illegible]
67.37	74	68.24	[illegible]	68.14	74.13	69.33	74.21	69.5	[illegible]
69.76	74.25	70.72	[illegible]	72.2	74.4	72.24	74.41	72.78	[illegible]
74.2	74.5	74.27	[illegible]	74.48	74.33	78.1	74	81.75	74
82.37	74	85.32	[illegible]	86.1	73	86.54	72.17	87.34	[illegible]

91.3	72	94.82	71.54	95.25	71.5	99.97	71.3	100.41	71.24
100.82	71.16	101.29	71.03	101.5	71	102.93	70.56	103.85	70.23
104.5	70	106.09	69.67	108.41	69	109.53	69	110.44	69
110.66	69	111.83	69.38	112.4	69.58	113.03	69.71	113.31	69.78
113.48	69.82	114.5	69.96	114.53	69.96	114.86	70	115.62	70.1
116.34	70.21	118.78	70.51	119.7	70.65	120.16	70.74	120.41	70.79
121.54	70.93	121.61	70.94	121.92	71	124.23	71.45	124.67	71.5
126	71.74	126.54	71.83	127.59	72	127.67	72.01	127.69	72.02
128.72	72.15	129.66	72.24	130.59	72.28	131.47	72.3	134.18	72.3
139.49	72.52	140.66	72.56	141.34	72.6	141.91	72.64	142.29	72.68
143.35	73	144.03	73	145.06	73.34	147.22	74	151.13	74.97
151.25	75	151.32	75.02	151.36	75.03	153.16	75.47	153.81	75.62
154.15	75.69	155.79	76	161.15	76.96	161.47	77	162.88	77.26
163.36	77.37	165.79	78	168.02	78.52	170.02	79	171.82	79.43
172.14	79.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	102.93	.045	118.78	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
102.93	118.78	22.604	30.943	40.021	.1	.3

CROSS SECTION OUTPUT Profile 4100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	72.53	Element	Left OB	Channel	Right OB
Vel Head (m)	0.00	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	72.53	Reach Len. (m)	22.60	30.94	40.02
Crit W.S. (m)	70.09	Flow Area (m2)	37.52	44.28	13.71
E.G. Slope (m/m)	0.300034	Area (m2)	37.52	44.28	13.71
Q Total (m3/s)	16.16	Flow (m3/s)	3.79	11.27	1.10
Top Width (m)	78.10	Top Width (m)	39.43	15.85	20.82
Vel Total (m/s)	0.17	Avg. Vel. (m/s)	0.10	0.25	0.08
Max Chl Dpth (m)	3.53	Hydr. Depth (m)	0.95	2.79	0.66
Conv. Total (m3/s)	2754.0	Conv. (m3/s)	645.8	1920.4	187.9
Length Wtd. (m)	30.94	Wetted Per. (m)	40.74	16.24	20.97
Min Ch El (m)	69.00	Shear (N/m2)	0.31	0.92	0.22
Alpha	1.08	Stream Power (N/m s)	0.03	0.23	0.02
Frctn Loss (m)		Cum Volume (1000 m3)	0.56	9.80	0.49
C & E Loss (m)		Cum SA (1000 m2)	0.69	16.97	1.08

CULVERT

RIVER: 2
REACH: 1 RS: 28.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 29.85
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
10	74.5		101.14	74.5	

Upstream Bridge Cross Section Data
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	77	2.49	77	4.11	77	7.34	76.91	7.51	76.89
8.95	76.61	9.55	76.59	9.76	76.52	12.32	76.38	12.65	76.35
13.26	76.33	13.45	76.31	16.72	76.19	19.31	76	19.99	76
20.62	76	21.35	76	22.12	76	23.07	76	23.98	75.76
24.82	75.52	25.63	75.37	27.11	75	27.86	74.86	28	74.84
29.13	74.64	29.82	74.55	30.23	74.49	30.82	74.43	31.22	74.38
31.5	74.36	31.81	74.32	32.11	74.3	32.32	74.28	32.33	74.26
32.35	74.25	32.64	73.98	37.74	70.83	38.85	70.44	40.12	70.23
42.34	70.31	43.93	71.34	44.96	71.51	44.88	71.66	45.83	71.93
46.4	72.03	46.47	72.16	48.28	72.18	49.64	72	50.53	71.89
50.78	71.85	51.45	71.74	52.07	71.82	52.18	71.81	54.06	71.99
54.11	72	54.37	72	54.67	72	55.08	72	56.86	72
57.22	72	57.22	72	59.55	72.45	60.38	72.61	61.06	72.75
61.69	72.86	62.38	73	64.17	73.34	65.38	73.59	66.2	73.73
67.37	74	68.99	74.19	69.14	74.19	69.33	74.21	69.5	74.23
69.76	74.25	70.32	74.35	72.2	74.4	72.84	74.41	72.76	74.39
74.02	74.5	74.28	74.4	74.48	74.33	78.6	74	80.75	74
82.49	74	85.82	73.09	88.32	73	90.54	72.07	90.94	72
91.3	72	94.82	71.54	95.25	71.5	99.97	71.3	100.41	71.24
100.82	71.16	101.29	71.03	101.5	71	102.93	70.56	103.85	70.23
104.5	70	106.09	69.67	108.41	69	109.53	69	110.44	69
110.66	69	111.83	69.38	112.4	69.58	113.03	69.71	113.31	69.78
113.48	69.82	114.5	69.96	114.53	69.96	114.86	70	115.62	70.1
116.34	70.21	118.78	70.51	119.7	70.65	120.16	70.74	120.41	70.79
121.54	70.93	121.61	70.94	121.92	71	124.23	71.45	124.67	71.5
126	71.74	126.54	71.83	127.59	72	127.67	72.01	127.69	72.02
128.72	72.15	129.66	72.24	130.59	72.28	131.47	72.3	134.18	72.3
139.49	72.52	140.66	72.56	141.34	72.6	141.91	72.64	142.29	72.68

143.35	73	144.01	73	145.06	73.34	147.22	74	151.13	74.97		
151.25	75	151.32	75.07	151.36	75.03	153.36	75.47	153.81	75.62		
154.15	75.69	155.79	76	161.25	76.96	161.47	77	162.88	77.26		
163.36	77.37	165.39	78	166.22	78.52	170.52	79	171.82	78.43		
172.14	79.5										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	102.93	.045	118.78	.055

Bank Sta: Left Right Coeff Contr. Expan.

102.93 118.78 .1 .3

Downstream Deck/Roadway Coordinates

num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
28.73	74.5	171.79	74.5

Downstream Bridge Cross Section Data

Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	79.18	.22	79.16	.79	79.12	1.07	79.09	1.24	79.08
1.43	79.06	2.11	79	2.74	78.94	3.37	78.82	4.21	78.63
11.9	78	16.14	77.51	20.98	77	26.5	76.28	28.73	74
35.18	75.24	36.82	75	38.82	74.7	43.35	74	44.48	73.73
47.1	73	48.39	72.52	49.71	72	52.38	71.08	52.57	71
52.79	70.93	53.3	70.78	55.2	69.9	56.21	68.45	58.13	68.45
61.35	69.96	62.03	70.21	62.13	70.43	62.22	70.47	62.27	70.55
62.42	70.6	62.56	70.64	63.3	71	67.3	71.74	68.42	72
69.35	72.26	71.13	72.69	73.03	73	73.22	73	74.32	73
77.09	73	77.55	73	78.53	73.2	79.68	73.4	85.49	73.52
86.35	73.38	87.49	73.23	88.22	73	88.35	73	88.42	73
89.69	73	89.72	73	89.73	73	89.75	73	89.84	73
89.85	73	91.05	73	91.36	73	92.64	73	99.07	73
101.23	73	109.07	73	112.31	72.47	112.84	72.26	113.13	72.23
113.82	72.18	114.72	72	116.25	71.59	119.44	71	121.23	70.19
121.7	70.44	122.74	70.21	123.77	70	124.16	69.87	124.23	69.86
124.93	69.64	125.1	69.53	125.43	69.35	125.64	69.23	126.13	68.93
127.11	67.83	128.13	67.76	129.17	67.84	130.28	69.34	130.59	69.61
130.8	69.77	130.86	69.82	131.28	70	131.46	70.11	132.15	70.24
132.98	70.4	133.45	70.52	133.48	70.61	135.54	70.89	135.7	70.91
136.24	71	136.92	71.13	139.97	71.75	141.21	72	144.22	72.41
145.38	72.57	146.24	72.68	146.41	72.7	148.49	73	153.33	73.22
155.73	73.63	156.16	73.68	156.15	73.69	162.22	73.87	162.8	73.89
164	73.93	164.24	73.95	164.44	73.97	164.48	73.97	165.2	74
167.41	74.31	168.63	74.49	171.79	74.92	172.37	75	172.46	75.1
173.53	75.13	173.68	75.17	174.61	75.3	175.2	75.4	175.88	75.49
176.22	75.53	176.54	75.57	176.82	75.61	179.61	76	182.42	76.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	119.44	.045	135.56	.055

Bank Sta: Left Right Coeff Contr. Expan.

119.44 135.56 .1 .3

Upstream Embankment side slope = [illegible] horiz. to 1.0 vertical
Downstream Embankment side slope = [illegible] horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 74.5
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name	Shape	Rise	Span
Culvert #2	Circular	1.[illegible]	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge headwall
Solution Criteria = Highest U.S. ED

Culvert	Upstream Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	[illegible]	.013	.013	1	.9	1

Upstream Elevation = [illegible]
Centerline Station = 46.237
Downstream Elevation = [illegible]
Centerline Station = [illegible].64

Culvert Name	Shape	Rise	Span
Culvert #1	Circular	1.[illegible]	

FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge headwall
Solution Criteria = Highest U.S. ED

Culvert	Upstream Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	.5	[illegible]	.013	.013	1	.9	1

Upstream Elevation = [illegible]
Centerline Station = 139.33
Downstream Elevation = [illegible]
Centerline Station = [illegible]

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #2

Q Culv Group (m3/s)	5.00	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.60
Q Barrel (m3/s)	5.00	Culv Vel DS (m/s)	6.69
E.G. US. (m)	72.53	Culv Inv El Up (m)	70.24
W.S. US. (m)	72.52	Culv Inv El Dn (m)	68.61
E.G. DS (m)	69.53	Culv Frctn Ls (m)	0.52
W.S. DS (m)	69.15	Culv Exit Loss (m)	2.09
Delta EG (m)	3.00	Culv Entr Loss (m)	0.40
Delta WS (m)	3.37	Q Weir (m3/s)	
E.G. IC (m)	72.48	Weir Sta Lft (m)	
E.G. OC (m)	72.52	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	71.47	Weir Max Depth (m)	
Culv WS Outlet (m)	69.33	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.89	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.23	Min El Weir Flow (m)	74.50

Warning: At least one culvert in the culvert group has supercritical flow at the outlet. However, since more than one culvert in the culvert group has flow, the program cannot determine if the downstream cross section should be subcritical or supercritical flow. The program used the downstream subcritical answer, even though it may not be valid.

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #1

Q Culv Group (m3/s)	10.00	Culv Full Len (m)	29.95
# Barrels	1	Culv Vel US (m/s)	5.79
Q Barrel (m3/s)	10.00	Culv Vel DS (m/s)	5.79
E.G. US. (m)	72.53	Culv Inv El Up (m)	68.83
W.S. US. (m)	72.52	Culv Inv El Dn (m)	67.66
E.G. DS (m)	69.53	Culv Frctn Ls (m)	1.17
W.S. DS (m)	69.15	Culv Exit Loss (m)	1.36
Delta EG (m)	3.00	Culv Entr Loss (m)	1.02
Delta WS (m)	3.37	Q Weir (m3/s)	
E.G. IC (m)	74.19	Weir Sta Lft (m)	
E.G. OC (m)	72.53	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	72.35	Weir Max Depth (m)	
Culv WS Outlet (m)	69.13	Weir Avg Depth (m)	
Culv Nml Depth (m)	1.36	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.52	Min El Weir Flow (m)	74.50

Warning: At least one culvert in the culvert group has supercritical flow at the outlet. However, since more than one culvert in the culvert group has flow, the program cannot determine if the downstream cross section should be subcritical or supercritical flow. The program used the downstream subcritical answer, even though it may not be valid.
Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 73

INPUT
Description: section8
Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	79.18	.22	79.16	.79	79.12	1.07	79.09	1.24	79.08
1.43	79.06	2.11	79	2.74	78.94	3.92	78.82	6.21	78.63
11.9	78	16.14	77.51	20.96	77	26.3	76.28	28.73	76
35.18	75.24	36.92	75	38.82	74.7	43.55	74	44.48	73.73
47.1	73	48.19	72.12	49.71	72	52.36	71.08	52.57	71
52.79	70.93	53.3	70.78	55.2	69.9	56.21	68.45	58.33	68.45
61.35	69.96	62.03	70.21	62.13	70.43	62.22	70.47	62.27	70.55
62.42	70.6	62.56	70.64	63.8	71	67.3	71.74	68.42	72
69.35	72.26	71.13	72.59	73.03	73	73.22	73	74.32	73
77.09	73	77.16	73	78.58	73.2	79.68	73.4	85.49	73.52
86.35	73.38	87.49	73.23	88.26	73	88.35	73	88.42	73
89.69	73	89.72	73	89.73	73	89.75	73	89.84	73
89.85	73	91.05	73	91.56	73	92.64	73	99.67	73
101.33	73	109.97	73	112.31	72.47	112.84	72.36	113.13	72.29
113.62	72.18	114.72	72	116.65	71.59	119.44	71	121.23	70.56
121.7	70.44	122.74	70.21	123.77	70	124.18	69.87	124.23	69.84
124.92	69.64	125.1	69.73	125.43	69.35	125.64	69.23	126.13	68.93
127.11	67.63	128.14	67.78	129.17	67.84	130.26	69.34	130.59	69.63
130.8	69.77	130.86	69.82	131.08	70	131.45	70.11	132.15	70.26
132.86	70.4	133.45	70.62	133.94	70.61	135.56	70.89	135.7	70.91
136.04	71	136.92	71.17	139.57	71.75	141.15	72	144.52	72.41
145.58	72.57	146.09	72.45	146.41	72.7	148.69	73	153.93	73.52
155.73	73.63	156.26	73.[illegible]	156.28	73.69	162.62	73.87	162.8	73.88
164	73.93	164.24	73.95	164.44	73.97	164.48	73.97	165.2	74
167.41	74.31	168.03	74.49	171.79	74.92	172.37	75	172.46	75.01
174.33	75.13	173.26	75.17	174.21	75.3	175.3	75.4	175.88	75.48
176.22	75.33	176.33	75.7	178.12	75.61	179.61	76	182.42	76.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	119.44	.045	135.56	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
119.44	135.56	99.689	74.442	49.693	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	69.53	Element			
Vel Head (m)	1.37	Wt. n-Val.	0.055	0.045	
W.S. Elev (m)	69.15	Reach Len. (m)	99.69	74.44	49.69
Crit W.S. (m)	69.15	Flow Area (m2)	2.16	4.22	
E.G. Slope (m/m)	0.006315	Area (m2)	2.16	4.22	
Q Total (m3/s)	16.16	Flow (m3/s)	3.80	12.36	
Top Width (m)	8.38	Top Width (m)	4.02	4.36	
Vel Total (m/s)	2.53	Avg. Vel. (m/s)	1.76	2.93	
Max Chl Dpth (m)	1.39	Hydr. Depth (m)	0.54	0.97	
Conv. Total (m3/s)	101.9	Conv. (m3/s)	23.9	77.7	
Length Wtd. (m)	72.88	Wetted Per. (m)	4.55	5.59	
Min Ch El (m)	67.76	Shear (N/m2)	117.76	187.35	
Alpha	1.14	Stream Power (N/m s)	207.21	549.06	
Frctn Loss (m)	1.69	Cum Volume (1000 m3)	0.11	9.05	0.22
C & E Loss (m)	0.07	Cum SA (1000 m2)	0.20	16.66	0.66

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: Divided flow computed for this cross-section.
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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 27

INPUT
Description: section7
Station Elevation Data num= 149

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.59	4.11	75.19	4.02	75.02	6.12	75.01	6.3	75
6.59	75	6.79	75	11.16	74.22	11.56	74.16	11.76	74.13
11.88	74.11	12.05	74.09	12.98	74.03	13.02	74.03	13.16	74
13.81	74	15.19	74	15.36	74	16.25	73.76	16.37	73.72
16.91	73.61	17.51	73.52	18.31	73.26	18.7	73.23	18.92	73.21
20.5	73.11	20.77	73.09	21.63	73.02	21.65	73.02	21.81	73
22.7	72.88	24.44	72.62	24.53	72.56	25.27	72.52	25.77	72.5
26.67	72.53	28.42	72.31	29.02	72.24	30.16	72.17	30.78	72.13
31.41	72.24	32.14	72.19	32.44	72.17	32.54	72.15	33.45	72
37.18	71.57	39.75	71	39.11	70.99	39.12	70.99	39.14	70.99
39.16	70.98	43.45	70.42	43.93	70.12	44.5	70.19	45.23	70
45.45	69.86	46.46	69.75	47.15	69.65	47.68	69.55	50.4	69
50.8	69	51.66	69	56.45	68.15	56.6	68.13	58.39	68
58.57	68	58.7	68	59.51	68	60.41	68	61.3	68
61.81	67.92	63.26	67.41	63.28	67.97	63.41	67.96	63.9	67.98
63.95	67.97	64.59	67.44	64.66	67.92	65.36	67.74	66.23	67.44
70.95	67.2	71.68	67.11	72.36	67	72.51	67	73.8	66.91
75.22	66.53	76.18	66.28	78.17	66	78.97	66	79.93	66
80.85	66	82.47	66	82.65	66.01	82.17	66.02	83.55	66.21
84.14	66.33	85.03	66.43	85.53	66.49	86.31	66.61	87.27	66.33
88.33	66.91	89.4	66.93	88.71	66.98	89.74	66.98	89.78	66.99
90.65	67	91.27	67.02	91.68	67.02	95.75	67.03	95.85	67.03
97.19	67	97.39	67	100.77	66.63	101.3	66.57	103.21	66.4
104.85	66.14	105.21	66.14	105.84	66	106.08	66	106.47	66
108	66	108.1	66.07	112.23	67	114.45	67.52	116.17	68
119.09	69.82	120.46	69	122.36	69.38	122.73	69.48	123.46	69.64
124.59	69.9	124.69	70	125.21	70.05	125.34	70.23	129.11	71
131.1	71.45	133.15	71	134.92	72.09	136.28	72.19	138.94	72.37
146.86	73	154.29	73.13	159.38	74	166.21	74.53	167.4	74.62
169.26	74.77	172.15	75	177.65	75.48	179.21	75.62		

Manning's n Values num= 2

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	70.35	.045	95.75	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.35	95.75	112.047	121.601	102.264	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]	Element			

Vel Head (m)	0.21	Wt. n-Val.		0.045	0.055
W.S. Elev (m)	66.53	Reach Len. (m)	141.05	121.60	102.26
Crit W.S. (m)	66.62	Flow Area (m2)		3.82	2.97
E.G. Slope (m/m)	0.057188	Area (m2)		3.82	2.87
Q Total (m3/s)	16.16	Flow (m3/s)		10.25	5.91
Top Width (m)	19.26	Top Width (m)		10.58	8.68
Vel Total (m/s)	2.42	Avg. Vel. (m/s)		2.68	2.06
Max Chl Dpth (m)	0.53	Hydr. Depth (m)		0.36	0.33
Conv. Total (m3/s)	67.6	Conv. (m3/s)		42.8	24.7
Length Wtd. (m)	117.98	Wetted Per. (m)		10.68	8.77
Min Ch El (m)	66.00	Shear (N/m2)		200.85	183.25
Alpha	1.05	Stream Power (N/m s)		538.27	377.98
Frctn Loss (m)	2.66	Cum Volume (1000 m3)		8.75	0.15
C & E Loss (m)	0.02	Cum SA (1000 m2)		16.10	0.44

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 26

INPUT
Description: section6
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	80.15	.78	80	4.89	79.11	5.11	79.06	5.18	79.04
5.37	79	5.87	78.87	9.95	78	13.97	77.1	14.4	77
14.88	76.89	18.78	76	20.56	75.61	20.93	75.52	21.56	75.38
22.79	75.1	23.24	75	24.68	74.68	25.55	74.49	25.99	74.39
28.35	74	29.99	73.75	34.05	73	41.11	72.02	41.25	72
44.38	71.64	45.92	71.46	46.79	71.36	47.83	71.21	49.39	71
50.31	70.74	50.46	70.67	50.77	70.55	51.56	70.22	52.1	70
52.3	69.92	54.37	69	55.83	68.36	56.65	68	57.62	67.56
58.95	67	60.31	66.11	61.24	66	63.32	65.08	63.51	65
64.63	64.52	65.8	64	67.34	63.35	68.09	63	73.11	63
73.44	63	73.56	63.02	74.01	63.11	77.01	63.72	78.02	63.91
78.5	64	79.49	64.13	80.21	64.33	82.27	64.73	83.67	65
85.79	65.46	89	65.81	91.19	66	91.58	66	91.81	66
93.01	66.11	93.31	66.13	97.44	66.36	98.73	66.39	99.54	66.42
104.96	67	105.35	67.06	105.52	67.09	105.65	67.12	109.24	68
113.11	68.45	118.3	69	122.45	69.36	123.56	69.46	126.34	69.72
129.36	70	136.33	70.79	137.43	70.92	138.22	71	145.11	71.8
146.5	72	154.13	72.89	154.17	73	154.18	73	154.22	73.01
154.32	73.02	161.86	74	169.13	74.41	169.86	75	173.24	75.42
173.78	75.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.32	.045	85.79	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
63.32	85.79	126.935	109.475	99.215	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	64.11	Element	Left OB	Channel	Right OB
Vel Head (m)	[illegible]	Wt. n-Val.		0.045	
W.S. Elev (m)	63.81	Reach Len. (m)	126.93	109.48	99.22
Crit W.S. (m)	63.81	Flow Area (m2)		6.65	
E.G. Slope (m/m)	0.024[illegible]	Area (m2)		6.65	
Q Total (m3/s)	16.16	Flow (m3/s)		16.16	
Top Width (m)	11.21	Top Width (m)		11.21	
Vel Total (m/s)	2.43	Avg. Vel. (m/s)		2.43	
Max Chl Dpth (m)	0.81	Hydr. Depth (m)		0.59	
Conv. Total (m3/s)	102.3	Conv. (m3/s)		102.9	
Length Wtd. (m)	109.48	Wetted Per. (m)		11.46	
Min Ch El (m)	63.00	Shear (N/m2)		140.54	
Alpha	1.03	Stream Power (N/m s)		341.49	
Frctn Loss (m)	1.66	Cum Volume (1000 m3)		8.11	
C & E Loss (m)	0.05	Cum SA (1000 m2)		14.78	

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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 25

INPUT
Description: section5
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	71.75	4.2	71	4.99	70.85	5.07	70.83	5.22	70.8
5.36	70.78	5.59	70.74	5.96	70.68	6.62	70.58	7.79	70.39
8.41	70.29	10.22	70	10.44	69.95	11.73	69.68	12.29	69.55
12.69	69.46	12.98	69.4	14.59	69	16.5	68.57	19.43	68
22.08	67.42	22.74	67.23	23.38	67	23.97	66.73	24.26	66.59
25.65	66	27.12	65.31	27.96	65.1	28.39	65	29.3	64.81
29.94	64.67	32.36	64.08	32.47	64.05	32.53	64.04	32.69	64
35.02	63.56	37.75	63	37.79	62.99	41.55	62	42.45	61.8
45.82	61	49.34	61	50.73	61	51.33	61	53.93	61
54.17	61	54.41	61	54.69	61	54.92	61	55.78	61
56.2	61	56.61	61	56.93	61.02	57.1	61.06	58.39	61.22
59.5	61.31	60.18	61.43	60.59	61.53	62.94	61.82	63.05	61.85
63.47	61.94	63.52	61.94	64.26	62	65.24	62.13	65.94	62.21
66.59	62.25	67.91	62.34	70.06	62.44	70.54	62.45	70.73	62.5
72.42	62.52	75.27	63	75.94	63.26	76.61	63.5	77.44	63.82
78.09	64	79.56	64.4	80.05	64.53	81.1	64.81	81.79	65
82.5	65.19	83.05	65.32	83.3	65.35	84.31	65.66	84.54	65.73
85.53	66	87.13	66.42	89.29	67	91.53	67.57	93.04	68
93.31	68.05	98.35	68.60	101.42	68.93	101.57	68.95	101.65	68.96
102.16	69	103.23	69.06	104.23	69.11	104.36	69.12	104.49	69.12
105.41	69.18	105.68	69.19	105.97	69.21	106.22	69.23	106.59	69.26
106.72	69.27	113.26	69.68	113.78	69.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	41.55	.045	63.47	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
41.55	63.47	32.042	33.888	35.815	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G.-Elev (m)	61.79	Element	Left OB	Channel	Right OB
Vel Head (m)	0.14	Wt. n-Val.		0.045	
W.S. Elev (m)	61.65	Reach Len. (m)	32.04	33.89	35.81
Crit W.S. (m)	61.54	Flow Area (m2)		9.94	
E.G. Slope (m/m)	0.013619	Area (m2)		9.64	
Q Total (m3/s)	16.16	Flow (m3/s)		16.16	
Top Width (m)	18.45	Top Width (m)		18.45	
Vel Total (m/s)	1.68	Avg. Vel. (m/s)		1.68	
Max Chl Dpth (m)	0.65	Hydr. Depth (m)		0.52	
Conv. Total (m3/s)	138.4	Conv. (m3/s)		138.4	
Length Wtd. (m)	33.89	Wetted Per. (m)		18.57	
Min Ch El (m)	61.00	Shear (N/m2)		69.39	
Alpha	1.00	Stream Power (N/m s)		116.29	
Frctn Loss (m)	0.01	Cum Volume (1000 m3)		7.22	
C & E Loss (m)	0.01	Cum SA (1000 m2)		14.15	

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.
Note: Hydraulic jump was required between this cross section and the previous upstream section.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 24

INPUT
Description: section4
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.69	4.14	73.14	5.87	73	5.99	72.96	6.66	72.55
12.6	72	16.5	71.44	20.02	71	25.11	70.34	26.29	70.21
28.06	70	28.32	70	28.35	70	28.38	70	29.53	69.84
32	69.52	33.06	69.27	35.41	69	36.69	68.81	41.71	68
44.59	67.48	46.25	67.14	46.41	67.11	46.49	67.08	46.73	67
46.89	66.94	46.92	66.42	47.14	66.85	47.85	66.68	49.42	66
51.51	65.25	52.29	65	52.52	64.9	52.69	64.85	53.83	64.48
54.65	64.28	54.93	64.21	55.1	64.26	55.2	64.23	55.28	64.1
55.67	64	56.35	63.83	59.7	63	62.78	62.26	63.6	62.1
63.77	62.06	64.19	62	67.63	61.5	69.28	61.4	68.71	61.33
70.53	61	74.35	60.83	74.47	60.46	75.01	60.36	75.89	60.19
78.41	60	77.21	61	77.78	60	78.22	60	79.13	60
79.35	60	79.68	60	80.49	60.12	80.97	60.18	83.7	60.75
84.47	60.89	84.63	60.92	84.73	60.95	84.78	60.96	84.95	61
86.85	61.59	88.13	62	89.29	62.05	89.61	62.07	91.21	62.14
91.25	63	91.32	63.2	92.18	63.03	91.5	63.07	94.12	64

96.14	64.61	97.41	65	97.84	65.06	100.82	65.38	101.17	65.41
101.79	65.44	102.33	65.46	102.73	65.48	103.92	65.56	104.37	65.58
104.87	65.61	105.28	65.64	105.74	65.67	105.99	65.69	109.9	65.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.6	.045	88.13	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
63.6	88.13	157.007	146.128	141.32	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	61.17	Element	Left OB	Channel	Right OB
Vel Head (m)	0.27	Wt. n-Val.		0.045	
W.S. Elev (m)	60.90	Reach Len. (m)	157.01	146.13	141.32
Crit W.S. (m)	60.90	Flow Area (m2)		7.02	
E.G. Slope (m/m)	0.025320	Area (m2)		7.02	
Q Total (m3/s)	16.16	Flow (m3/s)		16.16	
Top Width (m)	13.19	Top Width (m)		13.19	
Vel Total (m/s)	2.30	Avg. Vel. (m/s)		2.30	
Max Chl Dpth (m)	0.90	Hydr. Depth (m)		0.53	
Conv. Total (m3/s)	101.6	Conv. (m3/s)		101.6	
Length Wtd. (m)	146.13	Wetted Per. (m)		13.35	
Min Ch El (m)	60.00	Shear (N/m2)		130.51	
Alpha	1.00	Stream Power (N/m s)		300.56	
Frctn Loss (m)	1.68	Cum Volume (1000 m3)		6.93	
C & E Loss (m)	0.07	Cum SA (1000 m2)		12.62	

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 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: 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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 23

INPUT
Description: section3
Station Elevation Data num= 119

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67.71	.48	67.66	5.77	67	5.81	67	8.85	66.5
11.83	66	14.24	65.73	14.86	65.67	15.76	65.57	17.61	65.38
19.15	65.2	20.76	65	23.99	64.23	24.51	64.1	24.95	64
25.1	63.96	28.93	63	31.5	62.36	32.41	62.14	32.58	62.1
33.04	62	34.87	61.6	37.08	61.16	37.64	61.08	38	61
38.86	60.76	39.41	60.61	41.67	60	43.51	59.5	45.51	59
46.51	58.7	48.71	58	49.82	57.91	49.05	57.87	49.95	57.63
50.46	57.52	51.39	57	52.26	57	52.31	57	55.3	57
61.29	57	63.44	57	63.79	57	65.04	57	67.21	57
68.54	57	68.94	57	70.69	57	72.13	57	73.85	57
74.46	57	75.1	57	75.79	57	76.44	57	76.58	57
77.14	57	77.26	57	77.58	57	80.05	57	80.14	57
82.55	57	83.46	57	83.49	57	84.38	57	84.44	57
85.54	57.06	85.91	57.09	90.75	57.43	92.8	57.72	93.01	57.75
93.79	57.8	93.84	57.82	95.35	57.87	95.46	57.89	95.71	57.94
98.32	57.97	98.76	58	99.52	58	101.17	58.13	101.27	58.15
101.43	58.19	102.09	58.38	103.86	59	104.39	59.18	104.58	59.25
105.09	59.43	106.41	60	106.73	60.14	108.23	60.71	108.71	60.9
109.96	61	110.36	61.55	111.26	61.94	111.4	62	111.62	62.08
113.81	63	115.79	63.75	116.33	64	119.11	64.64	120.56	65
120.87	65	120.98	65	121.26	65	121.58	65	121.98	65
122.19	65	122.55	65	133.54	65.65	134.54	65.7	135.17	65.73
135.61	65.75	139.13	66	146.54	66.47	154.06	67	162.53	67.86
163.01	67.91	163.32	67.94	163.9	68	169.77	68.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	45.51	.045	103.86	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.51	103.86	162.062	156.027	152.866	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	57.52	Element	Left OB	Channel	Right OB
Vel Head (m)	0.25	Wt. n-Val.		0.045	
W.S. Elev (m)	57.27	Reach Len. (m)	162.06	156.03	152.87

Crit W.S. (m)	57.28	Flow Area (m2)	16.41
E.G. Slope (m/m)	0.006543	Area (m2)	16.41
Q Total (m3/s)	16.16	Flow (m3/s)	16.16
Top Width (m)	40.27	Top Width (m)	40.27
Vel Total (m/s)	0.99	Avg. Vel. (m/s)	0.99
Max Chl Dpth (m)	0.45	Hydr. Depth (m)	0.41
Conv. Total (m3/s)	199.8	Conv. (m3/s)	199.8
Length Wtd. (m)	155.03	Wetted Per. (m)	40.40
Min Ch El (m)	57.00	Shear (N/m2)	26.04
Alpha	1.00	Stream Power (N/m s)	25.66
Frctn Loss (m)	1.30	Cum Volume (1000 m3)	5.22
C & E Loss (m)	0.01	Cum SA (1000 m2)	9.71

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

CROSS SECTION

RIVER: 2
REACH: 1 RS: 22

INPUT
Description: section2
Station Elevation Data num= 138

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.21	2.43	69.28	2.64	69.28	2.88	69.29	3.14	69.29
13	69.32	13.33	69.33	13.7	69.33	14.11	69.33	14.54	69.32
14.99	69.32	15.79	69.33	16.23	69.32	16.65	69.32	17.03	69.32
19.48	69.37	19.85	69.38	20.24	69.39	20.98	69.41	25.73	69.48
26.46	69.5	27.31	69.52	28.27	69.55	28.95	69.57	29.94	69.59
30.54	69.61	31.5	69.63	32.38	69.66	32.86	69.67	33.63	69.7
34.87	69.73	35.24	69.74	36.13	69.77	37.23	69.8	37.76	69.82
38.79	69.84	39.55	69.86	40.58	69.88	41.78	69.91	43.19	69.94
43.64	69.96	44.[illegible]	69.98	45.58	70	46.17	69.98	47.27	69.94
47.4	69.93	49.04	69.87	50.05	69.83	51.07	69.78	52.22	69.73
52.91	69.68	53.79	69.63	57.12	69.24	57.85	69.2	59.63	69.14
59.83	69.12	61.06	69	64.32	69	68.39	69	69.39	69.46
71.83	69.47	72.84	69	73.68	68.69	75.02	68	77.61	67.01
77.62	67	77.82	66.95	81.19	66	81.86	65.6	87.27	64.27
88.18	64	89.89	63.49	90.47	63.34	91.15	63.17	91.84	63
95.12	62	95.13	62	95.14	62	97.59	61	98.27	60.71
101.89	59.26	102.3	59	102.76	58.8	104.61	58	106.6	57.15
106.95	57	109.14	56.04	109.22	56	113.16	54.29	113.76	54.23
113.84	54	113.99	54	117.48	54	125.31	54.89	125.68	54.96
125.99	55	131.71	55.86	132.54	56	132.66	56	132.76	56.02
138.62	57	141.12	57.41	144.2	57.39	144.62	57.37	144.82	57.38
147.96	58	149.5	58.27	153.26	59	156.65	59.51	157.27	59.61
158.12	59.76	158.41	59.8	159.44	60	160.55	60.11	162.94	60.35
164.46	60.51	165.24	60.6	169.01	61	178.87	61.96	179.26	62
179.75	62.06	179.88	62.07	180.1	62.08	183.45	62.4	185.02	62.54
192.38	63	193.25	63.04	193.39	63.05	193.48	63.06	193.55	63.06
201.1	63.48	202.06	63.52	202.38	63.53	202.72	63.54	209.43	63.75
211.95	63.4	212.34	63.39	213.16	63.33				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	106.6	.045	138.62	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
106.6	138.62	167.77	168.659	174.248	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	59.37	Element	Left OB	Channel	Right OB
Vel Head (m)	0.32	Wt. n-Val.		0.045	
W.S. Elev (m)	59.05	Reach Len. (m)	167.77	168.66	174.25
Crit W.S. (m)	55.14	Flow Area (m2)		12.96	
E.G. Slope (m/m)	0.018195	Area (m2)		12.96	
Q Total (m3/s)	32.34	Flow (m3/s)		32.34	
Top Width (m)	16.72	Top Width (m)		16.72	
Vel Total (m/s)	2.50	Avg. Vel. (m/s)		2.50	
Max Chl Dpth (m)	1.25	Hydr. Depth (m)		0.78	
Conv. Total (m3/s)	239.8	Conv. (m3/s)		239.8	
Length Wtd. (m)	168.66	Wetted Per. (m)		17.05	
Min Ch El (m)	54.00	Shear (N/m2)		135.58	
Alpha	1.07	Stream Power (N/m s)		338.40	
Frctn Loss (m)	1.05	Cum Volume (1000 m3)		2.93	
C & E Loss (m)	0.06	Cum SA (1000 m2)		4.26	

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 1.3. 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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 21

INPUT
Description: section1
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.33	5.6	59.66	7.23	59.76	9.44	59.9	11.03	60
12.48	60.15	14.25	60.34	15.25	60.45	20.42	61	23.17	61.36
27.31	62	33.86	62.86	34.22	63	38.33	63.27	38.75	63.29
46.36	63	51.06	63	51.14	62.99	52.77	62.79	53.39	62.71
57.21	62.21	58.8	62	62.7	61.5	66.68	61	69.96	60.69
70.66	60.63	71.6	60.55	72.86	60.45	75	60.27	77.53	60.06
78.27	60	78.93	59.94	89.37	59	92.64	58.73	93.61	58.65
97.1	58.27	99.06	58.07	99.77	58	100.86	57.85	109.24	57
110.37	56.73	113.37	56	114.66	55.69	115.19	55.57	116.81	55.18
117.52	55	119.63	54.49	120.32	54.31	120.57	54.29	122.03	54.11
122.13	54.12	123.63	54.07	123.71	54.08	123.78	54.08	123.86	54.09
123.93	54.09	124.55	54	131.18	53.6	131.8	53.54	132.3	53.51
136.12	53	136.3	53	136.32	53	136.34	53	136.38	53
139.05	53	140.86	53	148.48	52.36	150.02	52.35	150.33	52.34
150.91	52.33	154.19	52.42	154.43	52.43	156.21	52.52	160.99	53
161.39	53	161.71	53	162.22	53	162.61	53	163.76	53
164.27	53.07	164.36	53.09	164.64	53.13	167.66	53.59	169.62	54
169.67	54	169.71	54	170.73	54.36	172.49	55	173.16	55.18
174.69	55.56	175.17	55.68	175.84	55.78	176.08	55.83	176.23	55.86
176.35	55.87	176.47	55.88	176.55	55.89	177.79	56	180.19	56
180.5	56	180.75	56	181.05	56	183.45	56.29	184.22	56.35
189.08	56.94	189.49	57	189.84	57	199.51	57	204.68	57.4
205.8	57.47	207.92	57.59	212.58	57.8	212.98	57.81	215.44	58
226.58	58	230.64	58	234.28	58	235.62	58	237.13	58
238.1	58	239.29	58	246.48	58	246.5	58	246.91	58
248.5	57.64	248.91	57.56	249.56	57.43	250.69	57.22	251.5	57.07
251.95	57	252.25	57	253.26	57	253.49	57	254.76	57
256.48	57	257.31	57	259.09	57	261.51	56.74	265.41	56.29
265.79	56.24	266.19	56.16	267.31	56.02	267.42	56	268.11	55.88
268.78	55.8	268.94	55.79	269.5	55.73	269.64	55.73	269.73	55.73

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	131.18	.045	167.66	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
131.18	167.66	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	53.55	Element			
Vel Head (m)	0.11	Wt. n-Val.		0.045	
W.S. Elev (m)	53.44	Reach Len. (m)			
Crit W.S. (m)	53.22	Flow Area (m2)		21.83	
E.G. Slope (m/m)	0.006011	Area (m2)		21.83	
Q Total (m3/s)	32.34	Flow (m3/s)		32.34	
Top Width (m)	33.86	Top Width (m)		33.86	
Vel Total (m/s)	1.48	Avg. Vel. (m/s)		1.48	
Max Chl Dpth (m)	1.11	Hydr. Depth (m)		0.64	
Conv. Total (m3/s)	361.3	Conv. (m3/s)		361.3	
Length Wtd. (m)		Wetted Per. (m)		33.97	
Min Ch El (m)	52.33	Shear (N/m2)		50.49	
Alpha	1.00	Stream Power (N/m s)		74.79	
Frctn Loss (m)		Cum Volume (1000 m3)			
C & E Loss (m)		Cum SA (1000 m2)			

SUMMARY OF MANNING'S N VALUES

River:2

Reach	River Sta.	n1	n2	n3
1	30	.055	.045	.055
1	29	.055	.045	.055
1	28.5	Culvert		
1	28	.055	.045	.055
1	27	.055	.045	.055
1	26	.055	.045	.055
1	25	.055	.045	.055
1	24	.055	.045	.055
1	23	.055	.045	.055
1	22	.055	.045	.055
1	21	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: 2

Reach	River Sta.	Left	Channel	Right
1	30	92.125	55.547	26.773
1	29	22.604	30.943	40.021
1	28.5	Culvert		
1	28	99.689	74.442	49.693
1	27	141.047	121.601	102.264
1	26	126.935	109.475	99.215
1	25	32.042	33.888	35.815
1	24	157.007	146.129	141.32
1	23	162.062	156.227	152.366
1	22	167.767	168.459	174.248
1	21	0	0	0

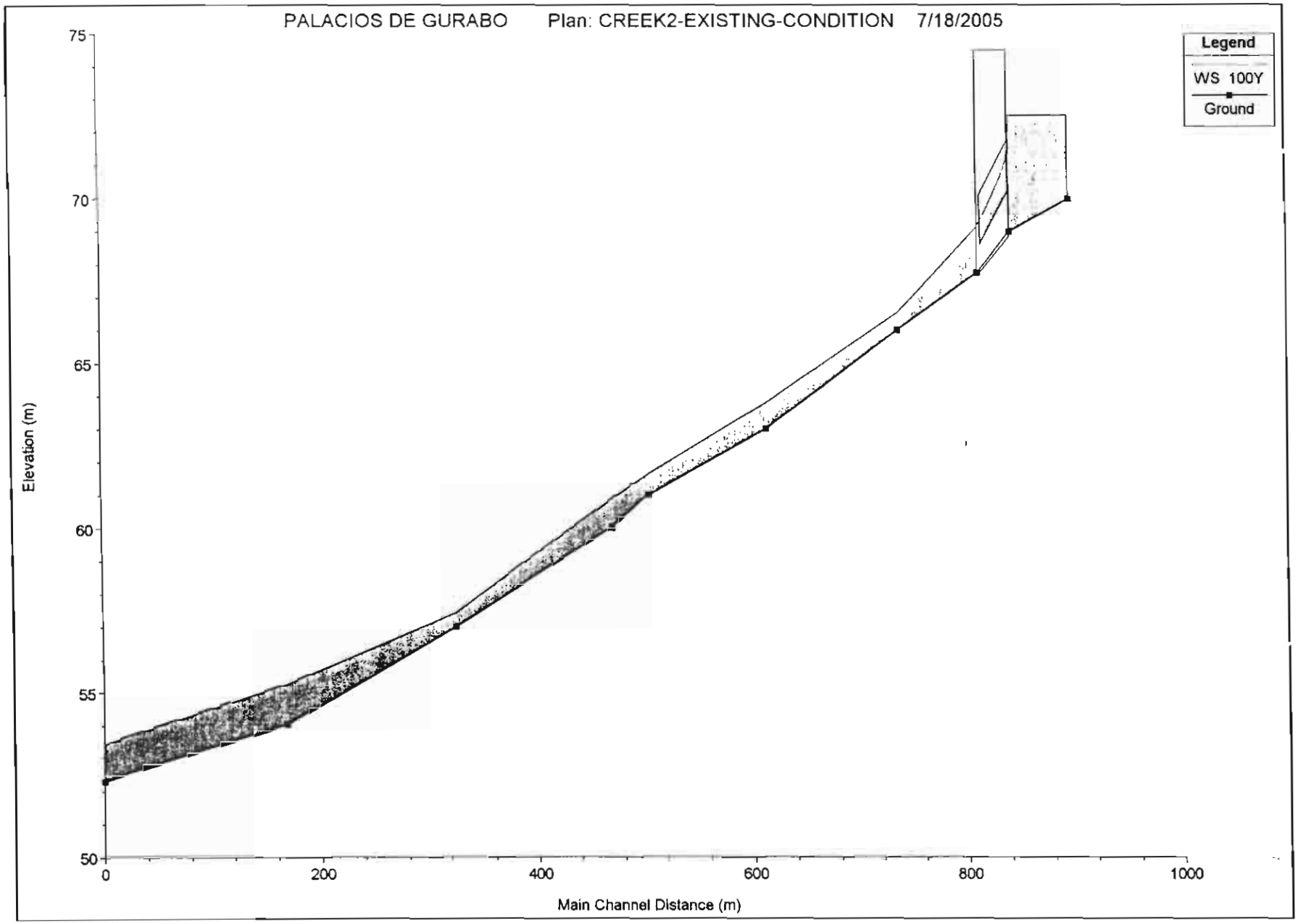
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: 2

Reach	River Sta.	Contr.	Expan.
1	30	.1	.3
1	29	.1	.3
1	28.5	Culvert	
1	28	.1	.3
1	27	.1	.3
1	26	.1	.3
1	25	.1	.3
1	24	.1	.3
1	23	.1	.3
1	22	.1	.3
1	21	.1	.3

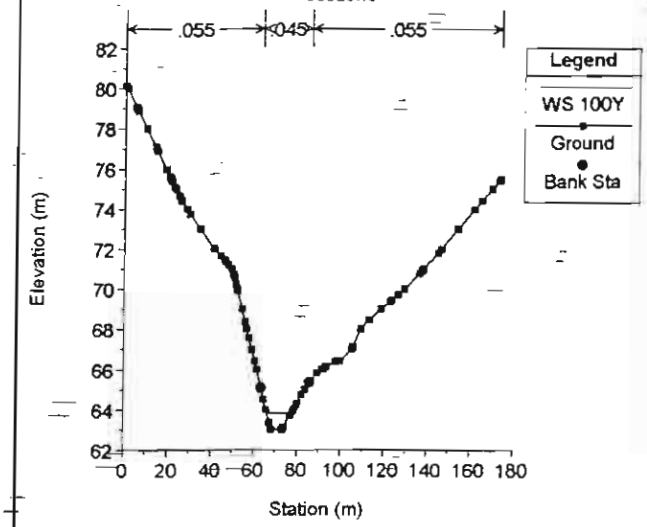
Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	30	100Y	10.49	70.00	72.53	70.35	72.53	0.000026	0.19	59.27	30.44	0.04
1	29	100Y	16.16	69.00	72.52	70.09	72.53	0.000034	0.25	95.51	74.11	0.05
1	28.5		Culvert									
1	28	100Y	16.16	67.76	69.15	69.15	69.53	0.025315	2.93	6.38	8.38	0.95
1	27	100Y	16.16	66.00	66.53	66.62	66.85	0.057188	2.08	8.69	19.25	1.42
1	26	100Y	16.16	63.00	63.81	63.81	64.11	0.024686	2.43	6.65	11.21	1.01
1	25	100Y	16.16	61.00	61.65	61.54	61.74	0.013628	1.68	9.64	18.45	0.74
1	24	100Y	16.16	60.00	60.90	60.90	61.17	0.025320	2.80	7.22	13.19	1.01
1	23	100Y	16.16	57.00	57.45	57.28	57.50	0.006543	0.99	16.47	40.27	0.49
1	22	100Y	32.34	54.00	55.25	55.19	55.57	0.018195	2.50	12.94	16.72	0.90
1	21	100Y	32.34	52.33	53.44	53.22	53.55	0.008011	1.48	21.84	32.09	0.59


PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005
Legend
WS 100Y
Ground
Elevation (m)
75
70
65
60
55
50
0
200
400
600
800
1000
Main Channel Distance (m)

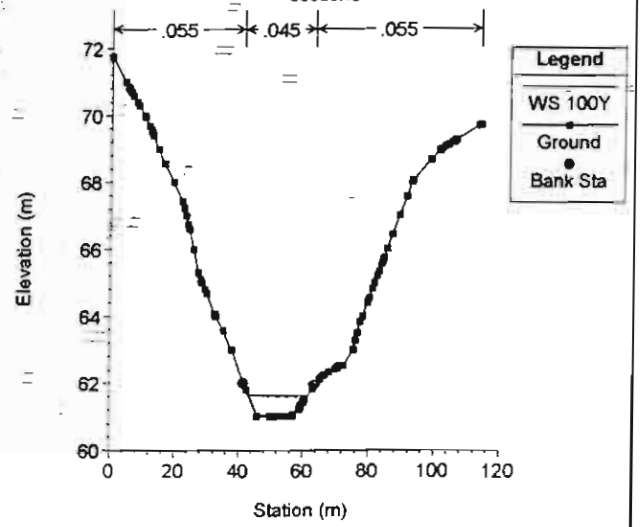
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section6



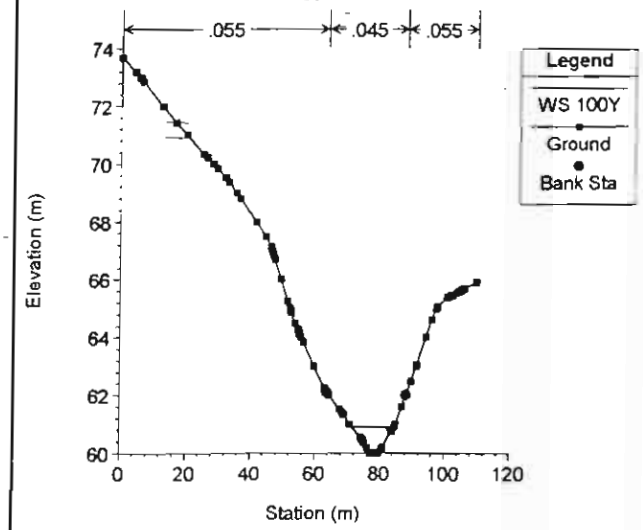
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section5



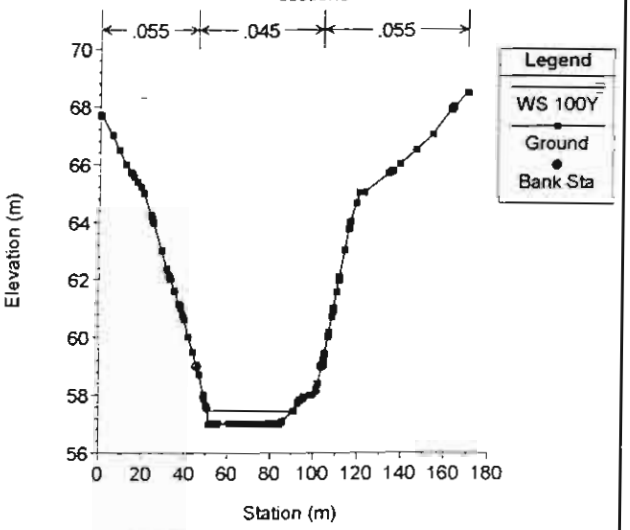
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section4



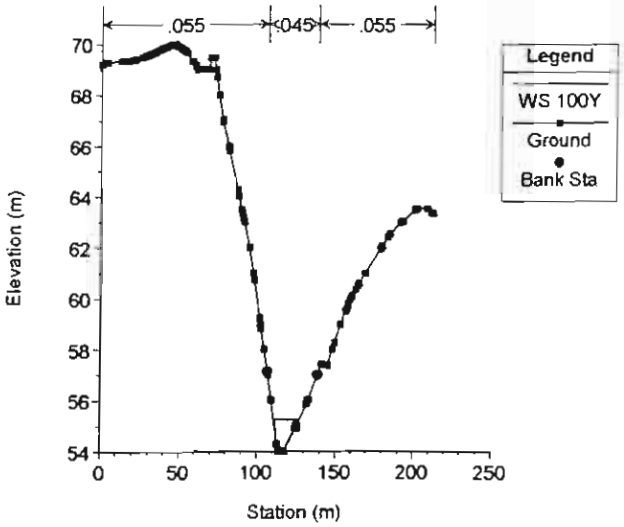
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section3



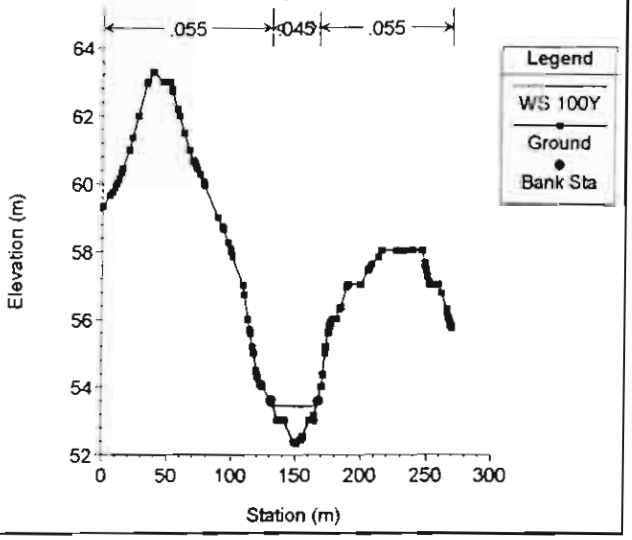
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section2



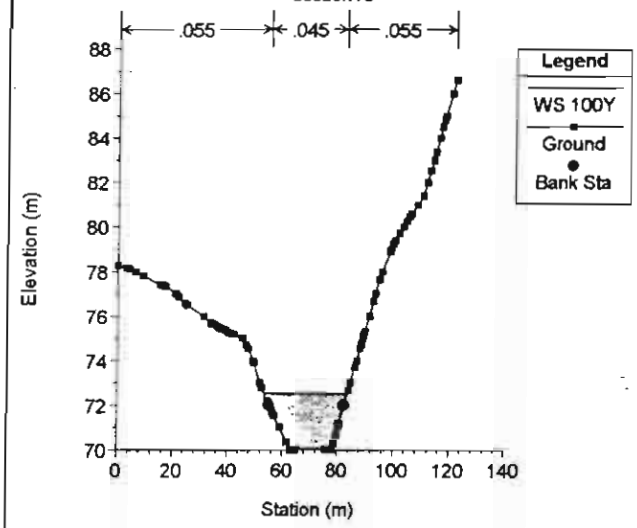
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section1



PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section10



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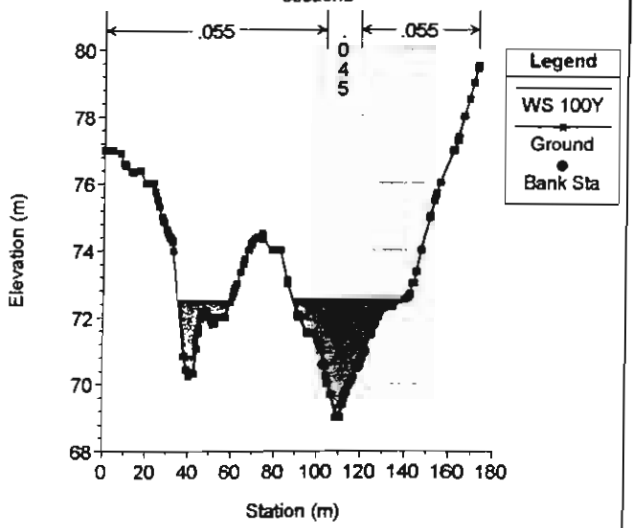
section9



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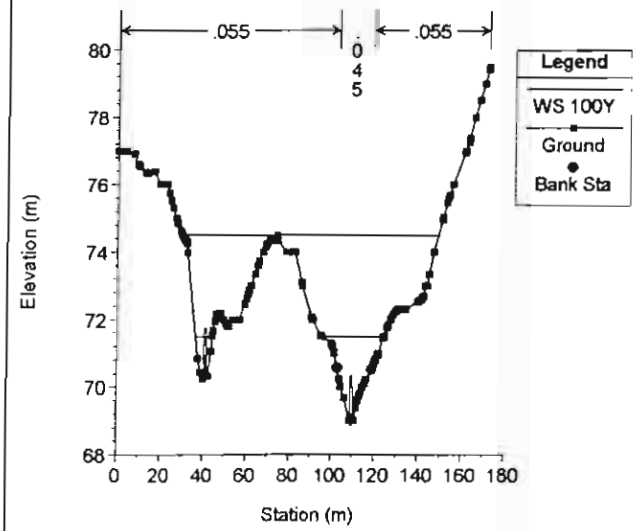

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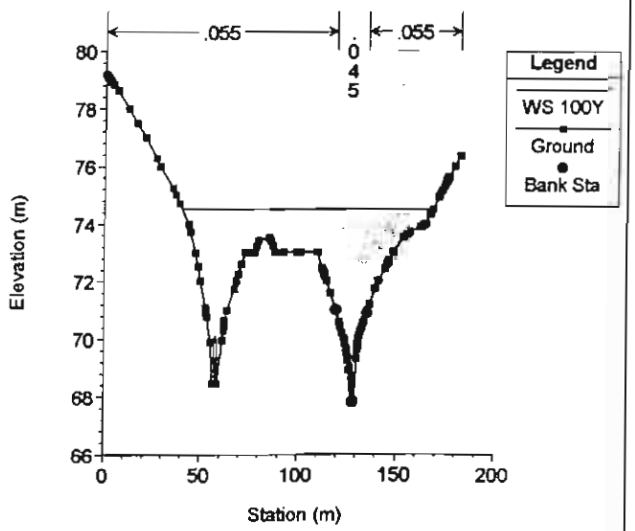
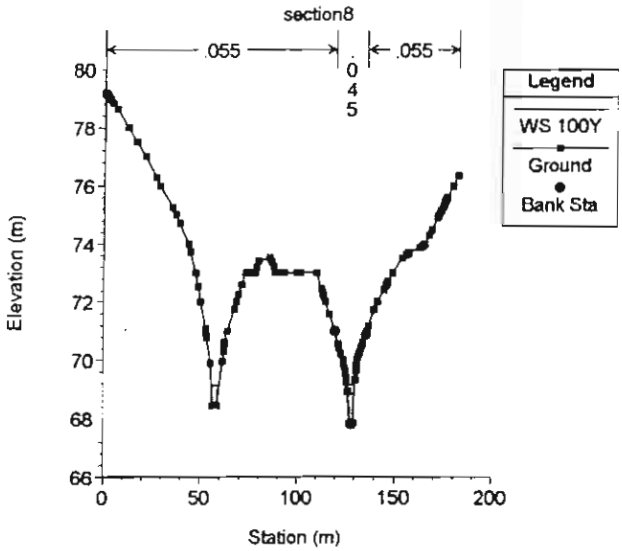


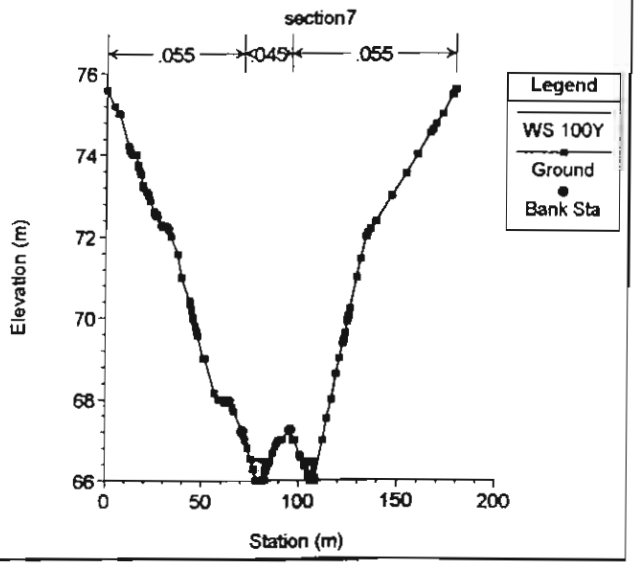
PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section8



PALACIOS DE GURABO Plan: CREEK2-EXISTING-CONDITION 7/18/2005

section7



APPENDIX G

HEC-RAS Results for Proposed Condition

HEC-RAS Version 3.1.1 May 2003
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
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PROJECT DATA
Project Title: PALACIOS DE GURABO
Project File : CREEK1.prj
Run Date and Time: 7/19/2005 1:46:41 PM

Project in SI units

PLAN DATA

Plan Title: CREEK1-PROPOSED-CONDITION
Plan File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.p03

Geometry Title: CREEK1-PROPOSED-CONDITION
Geometry File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.g03

Flow Title : CREEK1-PROPOSED-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f03

Plan Summary Information:

Number of:	Cross Sections	= 11	Multiple Openings	=	0
	Culverts	= 1	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

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

Computation Options
Critical depth computed all where necessary
Conveyance Calculation Method: Divided Flow in 8 values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: CREEK1-PROPOSED-CONDITION
Flow File : p:\278-Palacios de Gurabo\HEC-RAS\CREEK1.f03

Flow Data (m3/s)

River	Reach	RS	100Y	50Y	25Y	10Y	[illegible]
1	1	[illegible]	21.37	20.[illegible]	17.[illegible]	14.[illegible]	[illegible]
1	1	[illegible]	43.34	37.34	30.97	40.15	[illegible]
1	1	[illegible]	81.[illegible]	74.[illegible]	65.31	51.[illegible]	[illegible]
1	1	[illegible]	84.31	76.44	67.1	53.[illegible]	[illegible]
1	1	[illegible]	143.73	130.17	114.93	91.23	[illegible]
1	1	[illegible]	153.41	139.[illegible]	122.26	96.44	[illegible]
1	1		154.34	140.53	123.33	97.[illegible]	[illegible]

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1	1	[illegible]	Critical	Known WS = 53.34
1	1	[illegible]	Critical	Known WS = 53.22
1	1	[illegible]	Critical	Known WS = 53.06
1	1	[illegible]	Critical	Known WS = 52.78
1	1	[illegible]	Critical	Known WS = 52.14

GEOMETRY DATA

Geometry Title: CREEK1+PROFILE-CONDITION
Geometry File : p:\[illegible] de Durabo\HEC-RAS\CREEK1.g03

CROSS SECTION

RIVER: 1
REACH: 1 RS: 20

INPUT
Description: section
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	117.41	1.28	117	1.55	116.82	4.53	116	5.93	115.64
6.13	115.53	6.57	115.46	7.12	115.28	7.87	115.03	7.96	115
8.19	114.54	9.61	114.38	9.58	114.28	10.12	114.18	10.21	114.10
10.27	114.14	10.43	114	10.87	113.91	11.73	113.56	13.2	113
14.19	112.69	16.17	112	17.04	111.68	18.8	111	20.51	110.26
20.97	110.08	21.17	110	21.32	109.94	21.69	109.78	23.55	109
25.1	108.33	25.84	108	27.72	107.17	28.1	107	28.42	106.93
30.2	106	31.38	105.4	31.72	105.23	32.15	105	32.58	104.8
32.94	104.63	33.19	104.51	34.13	104	35.75	103.22	36.29	103
36.97	102.8	39.29	102	41.83	101.18	42.36	101	42.83	100.83
42.9	100.81	43	100.78	43.15	100.73	43.34	100.65	43.68	100.53
44.35	100.33	45.38	100	45.84	99.91	46.22	99.71	46.58	99.53
46.98	99.45	48.41	99	49.75	99	49.46	98.7	51.39	98
53.07	97.38	53.96	97	54.94	96.57	56.45	96	58.77	95.02
58.8	95	58.85	94.98	59.41	94.73	61.07	94	61.93	93.62
63.27	93	64.22	92.58	65.44	92	66.22	91.82	67.03	91
68.55	90.59	68.84	90.46	69.54	90.13	69.8	90	70.12	89.86
71.84	89	72.22	89	72.65	89	72.9	89.12	73.23	89.21
74.47	90	74.9	90.25	76.21	91	77.79	91.87	78.02	92
78.83	92.44	79.79	93	80.26	93.27	81.53	94	83.17	94.47
83.24	95	84.1	95.69	84.96	95.8	84.78	95.88	84.57	95.91
84.91	95.93	84.84	95.94	84.96	95.95	84.98	95.96	85.06	96
85.12	96.03	87.01	97	87.21	97.1	88.95	98	90.5	98.78
90.93	99	91.81	99.44	92.16	99.62	92.9	99.99	93.92	100
93.43	100.25	95.29	101	96.82	101.58	97.6	102	99.36	102.87
99.69	103	101.35	103.74	101.91	104	103.41	104.27	104.12	105
104.22	105	104.42	105	105.83	105.27	106.48	105.71	106.91	105.91
107.6	105.35	108.29	105.45	108.92	105.49	109.37	105.54	109.87	105.58
110.27	105.61	112.42	105.83	112.8	105.84	112.74	105.86	112.89	105.88
115.33	105.94	115.43	105.95	115.46	105.95	115.5	105.95	115.55	105.95
116.72	106	117.22	106.02	117.24	106.03	118.09	106.04	118.93	106.07
119.04	106.07	119.84	106.14	119.93	106.14	120.24	106.18	121	106.24
121.27	106.32	122.36	106.52	123.36	106.55	123.9	106.56	124.26	106.62
124.77	106.46	125.48	106.35	125.83	106.32	127.54	106	127.59	105.93
127.8	105.99	128.06	105.82	128.84	105.77	129.69	105.64	130.1	105.51
130.46	105.41	131.54	105.13	131.97	105	134.26	104.28	134.3	104.08
135.01	104.05	135.37	104	135.21	103.98	135.41	103.92	136.76	103.49
138.5	103.02	138.51	103.01	138.55	103	141.37	102.2	141.45	102.17
142.03	102.07	142.54	102.04	142.63	102.08	143.21	102.2	146.71	103
148.45	103.71	149.49	104	150.24	104.19	150.7	104.3	151.66	104.48
152.33	104.53	152.94	104.55	153.05	104.54	153.71	104.52	161.15	104.41
161.21	104.4	161.7	104.39	162.35	104.37	162.79	104.35	163.16	104.34
163.76	104.33	163.9	104.33	164.32	105	166.03	105.85	166.2	105.93
166.32	106	166.23	106.11	166.02	106.81	166.44	107	168.44	107.04
170.63	108	171.04	108.2	172.71	109	173.78	109.59	174.02	109.73
174.42	109.87	174.54	110	175.18	110.49	175.97	110.67	176.1	110.7
176.21	110.78	176.7	111	177.02	111.14	178.87	112	179.19	112.[illegible]

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	61.07	.045	97.17	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
61.07 97.17 64.40 [illegible] 57.42 .1 .3

CROSS SECTION OUTPUT Profile #100

E.G. Elev (m)	91.21	Element	Left OB	Channel	Right OB
Vel Head (m)	0.19	Wt. n-Val.		0.055	
W.S. Elev (m)	90.[illegible]	Reach Len. (m)	64.40	64.40	57.42
Crit W.S. (m)	90.72	Flow Area (m2)		7.22	
E.G. Slope (m/m)	[illegible]	Area (m2)		7.22	
Q Total (m3/s)	21.87	Flow (m3/s)		21.87	
Top Width (m)	7.17	Top Width (m)		7.17	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		3.03	
Max Chl Dpth (m)	3.[illegible]	Hydr. Depth (m)		1.[illegible]	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		[illegible]	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		7.21	
Min Ch El (m)	88.[illegible]	Shear (N/m2)		193.[illegible]	
Alpha	[illegible]	Stream Power (N/m s)		[illegible]	
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)	10.37	[illegible]	[illegible]
C & E Loss (m)	[illegible]	Cum SA (1000 m2)	14.13	[illegible]	[illegible]

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 19

INPUT
Description: section19
Station Elevation Data num= 145

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	101.08	.25	101.06	.35	101.05	.42	101.05	.67	101.04
1.7	101	2.09	100.99	2.11	100.98	2.13	100.98	2.17	100.97
2.21	100.96	2.37	100.95	8.85	100.24	9.23	100.17	9.65	100.09
13.03	100	13.48	99.9	13.43	99	14.38	98.72	16.14	98.15
16.31	98.07	16.85	98	19.45	97.43	21.69	97	26.16	96.04
26.35	96	26.45	95.98	26.46	95.97	26.48	95.97	26.5	95.96
26.53	95.96	26.56	95.95	26.61	95.95	27.89	95.77	28.05	95.75
28.16	95.72	28.42	95.69	30.47	95.21	33.99	94.56	34.58	94.43
35.79	94.21	35.86	94.2	36.01	94.16	36.11	94.13	36.61	94
38.14	93.64	40.85	93	41.71	92.79	47.35	92	47.85	91.92
49.94	91.66	53.68	91.24	55.37	91.1	56.98	91	57.09	90.99
57.1	90.99	57.11	90.99	57.12	90.99	57.14	90.99	57.15	90.99
57.18	90.98	62.98	90.28	63.41	90.22	63.94	90.15	64.61	90.06
65.04	90	65.6	89.92	66.57	89.77	67.34	89.64	67.94	89.54
68.38	89.45	68.7	89.39	70.53	89	74.47	88.27	75.79	88
80.64	87.1	81.33	87	82.29	86.87	83.72	86.69	87.18	86.3
87.26	86.28	87.6	86.24	88.1	86.17	88.5	86.11	90.33	87
91.65	87.6	92.02	87.776	92.49	88	93.99	88.66	94.75	89
98.34	89.71	96.99	90	97.52	90.24	97.75	90.34	99.19	91
100.68	91.66	101.42	92	102.62	92.62	103.73	93	104.7	93.37
106.03	94	108.05	94.75	108.47	94.83	108.92	94.91	109.31	95
110.34	95.22	112.03	95.59	112.5	95.69	112.83	95.76	113.07	95.81
113.23	95.84	113.34	95.87	114.15	96	116.21	96.27	116.97	96.37
121.35	97	127.69	97.86	128.02	98	129.75	98.12	131.3	98.22
131.49	98.32	132.04	98.34	132.14	98.39	135.2	98.54	135.81	98.59
136.32	98.64	140.33	98.69	143.82	98	145.33	97.65	146.81	97.2
147.45	97	147.63	96.93	147.73	96.88	148.02	96.75	148.98	96.29
149.73	96	150.3	95.74	151.54	95	152.7	94.34	152.93	94.22
153.07	94.15	153.18	94.11	153.37	94	153.47	93.95	153.99	93.6

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	75.79	.045	92.02	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
75.79	92.02	59.858	60.564	70.963	.1	.3

CROSS SECTION OUTPUT Profile #100

E.G. Elev (m)	98.20	Element	Left OB	Channel	Right OB
Vel Head (m)	1.11	Wt. n-Val.		0.045	
W.S. Elev (m)	97.09	Reach Len. (m)	59.86	60.56	70.96
Crit W.S. (m)	97.42	Flow Area (m2)		4.70	
E.G. Slope (m/m)	0.111267	Area (m2)		4.70	
Q Total (m3/s)	21.97	Flow (m3/s)		21.97	
Top Width (m)	9.76	Top Width (m)		9.76	
Vel Total (m/s)	4.67	Avg. Vel. (m/s)		4.67	
Max Ch Dpth (m)	0.51	Hydr. Depth (m)		0.48	
Conv. Total (m3/s)	67.1	Conv. (m3/s)		63.1	
Length Wtd. (m)	60.56	Wetted Per. (m)		10.01	
Min Ch El (m)	96.57	Shear (N/m2)		558.13	
Alpha	1.00	Stream Power (N/m s)		2608.51	
Frctn Loss (m)	2.95	Cum Volume (1000 m3)	19.37	63.15	21.39
C & E Loss (m)	0.06	Cum WA (1000 m2)	16.18	43.57	19.55

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 1[illegible]

INPUT
Description: section1[illegible]
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	88.95	2.69	89.14	3.65	88	13.09	87.66	21.69	87
22.25	86.95	23.1	86.38	23.34	86.89	31.4	86.34	38.02	86
41.44	85.81	41.92	85.[illegible]	42.07	85.8	42.4	85.79	42.81	85.78
43.3	85.76	43.89	85.74	44.6	85.72	45.43	85.48	52.86	85.26
53.84	85.32	55.04	85.27	56.19	85.23	57.31	85.18	58.33	85.13
58.49	85.13	60.34	85.26	60.24	85.56	61.42	85.92	61.43	85.92
62.12	85	62.41	85	63.01	84.99	64.11	84.97	64.34	84.97
65.38	84.95	66.[illegible]	84.94	67.88	84.92	68.01	85	69.09	85
70.16	85	70.54	85	71.3	85	71.91	85	72.63	85
74.86	85.86	75.19	85.95	75.22	85.96	75.33	86	75.4	86.02
76.08	87	76.87	87.46	80.82	88	83.03	88.95	83.43	89
84.3	89.34	85.93	90	88.19	90.66	88.81	90.84	89.01	90.9
89.37	91	92.14	91.07	94.64	92	96.27	92.29	100.4	93
102.51	93.25	102.78	93.28	102.93	93.38	103.48	93.47	106.81	93.71
106.97	93.7	108.2	93.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	45.43	.045	74.96	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.43	74.96	13.006	83.075	93.193	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	85.73	Element	Left OB	Channel	Right OB
Vel Head (m)	0.21	Wt. n-Val.		0.041	
W.S. Elev (m)	85.17	Reach Len. (m)	83.01	83.08	91.28
Crit W.S. (m)	85.17	Flow Area (m2)		10.81	
E.G. Slope (m/m)	0.027125	Area (m2)		10.88	
Q Total (m3/s)	21.97	Flow (m3/s)		21.97	
Top Width (m)	24.21	Top Width (m)		24.11	
Vel Total (m/s)	2.03	Avg. Vel. (m/s)		2.03	
Max Chl Dpth (m)	0.87	Hydr. Depth (m)		0.61	
Conv. Total (m3/s)	132.9	Conv. (m3/s)		132.9	
Length Wtd. (m)	83.08	Wetted Per. (m)		26.21	
Min Ch El (m)	84.31	Shear (N/m2)		110.48	
Alpha	1.22	Stream Power (N/m s)		224.48	
Frctn Loss (m)	2.73	Cum Volume (1000 m3)	29.37	41.68	21.39
C & E Loss (m)	0.21	Cum EA (1000 m2)	24.19	42.46	14.65

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 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: 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 not 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 17

INPUT
Description: section17
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
.2	82.23	.70	[illegible]	4.63	81.1	4.87	83	9.4	85.[illegible]
7.12	80.52	8.[illegible]	[illegible]	9.38	80	10.51	79.77	11.67	79.[illegible]
12.63	79.28	13.82	[illegible]	16.73	78.54	17.08	78.3	19.4	[illegible]
22.94	77.02	23.81	77.[illegible]	24.85	77	27.13	76.88	27.79	[illegible]
31.27	75.91	32.52	[illegible]	33.43	74.74	34.68	74.58	38.46	74.15
38.6	74.44	39.77	[illegible]	39.9	74.57	40.66	74.83	40.75	74.94
41.34	75	41.1	[illegible]	41.61	75.72	46.05	75.79	64.66	[illegible]
66.43	76.86	68.[illegible]	[illegible]	68.43	77.04	68.57	77.07	69.72	77.14
70.4	77.5	71.[illegible]	[illegible]	71.49	77.84	72.61	78	73.19	78.14
73.75	78.19	74.33	[illegible]	75.15	78.94	75.52	78.87	75.9	[illegible]
76.23	78.02	77.[illegible]	[illegible]	77.[illegible]	78.15	77.[illegible]	80	77.41	80.[illegible]
79.18	81	80.[illegible]	[illegible]	81.08	82	82.19	82.[illegible]	82.39	[illegible]
84.16	83.88	84.89	[illegible]	86.[illegible]	84.62	86.15	84.91	88.71	85
87.54	85.66	88.[illegible]	[illegible]	88.4	85.9	88.65	85.93	88.69	86
88.94	86.19	89.[illegible]	[illegible]	91.12	87.9	92.31	88	92.[illegible]	88.[illegible]
94.2	89	95.[illegible]	[illegible]	96.[illegible]	90	97.1	90.19	97.18	90.7
97.55	90.79	97.[illegible]	[illegible]	98.[illegible]	91	99.83	91.34	99.[illegible]	[illegible]
99.87	92.1	99.[illegible]	[illegible]	92.[illegible]	93.28	93.78	93.56	95.81	94
96.05	94	96.[illegible]	[illegible]	[illegible].63	94	99.41	94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
.2	.055	[illegible]	.045	41.61	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
17.78	43.81	91.354	82.13	81.5	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	78.29	Element			
Vel Head (m)	2.56	Wt. n-Val.		0.045	
W.S. Elev (m)	75.82	Reach Len. (m)	83.25	82.13	81.90
Crit W.S. (m)	76.13	Flow Area (m2)		8.93	
E.G. Slope (m/m)	0.017597	Area (m2)		8.93	
Q Total (m3/s)	63.34	Flow (m3/s)		63.34	
Top Width (m)	13.09	Top Width (m)		13.09	
Vel Total (m/s)	7.09	Avg. Vel. (m/s)		7.09	
Max Chl Dpth (m)	1.86	Hydr. Depth (m)		0.68	
Conv. Total (m3/s)	151.9	Conv. (m3/s)		151.9	
Length Wtd. (m)	82.13	Wetted Per. (m)		13.31	
Min Ch El (m)	74.44	Shear (N/m2)		1142.38	
Alpha	1.00	Stream Power (N/m s)		8104.36	
Frctn Loss (m)	1.46	Cum Volume (1000 m3)	29.37	61.86	21.39
C & E Loss (m)	0.24	Cum SA (1000 m2)	14.18	40.85	19.55

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 16

INPUT
Description: section16
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78.97	.07	78.91	1.37	78.85	2.6	78.33	2.85	78.83
3.81	78.08	4.22	78.84	4.96	78.75	8.61	78	11.79	77.34
13.35	77	13.95	76.88	18.12	76	19.18	75.79	19.45	75.72
19.91	75.64	20.79	75.41	22.82	75.03	22.87	75.02	22.95	75
24.7	74.44	27.74	74	30.67	73.7	36.33	73.71	38.12	74
42.42	74.85	43.2	74.98	47.24	75	46.69	75.87	46.95	75.93
47.03	75.96	47.2	76	47.64	76.12	50.17	76.8	51	77
51.86	77.1	52.53	77.49	52.86	77.55	53.43	77.64	53.93	77.7
54.06	77.75	56.62	77.74	58.03	78	58.21	78	58.29	78.23
60.33	78.44	62.77	79	62.42	79	65.28	79.74	66.05	80
66.47	80.12	69.1	81	69.12	81	69.15	81	71.76	81.49
74.24	82	75.4	82.51						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	22.82	.045	42.42	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
22.82	42.42	148.1	91.89	39.968	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	75.44	Element			
Vel Head (m)	0.17	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	75.33	Reach Len. (m)	148.10	91.89	39.97
Crit W.S. (m)	75.51	Flow Area (m2)	0.21	24.04	0.57
E.G. Slope (m/m)	0.017779	Area (m2)	0.21	24.04	0.57
Q Total (m3/s)	81.68	Flow (m3/s)	0.14	80.95	0.56
Top Width (m)	23.21	Top Width (m)	1.44	19.60	2.18
Vel Total (m/s)	3.29	Avg. Vel. (m/s)	0.67	3.37	0.98
Max Chl Dpth (m)	1.63	Hydr. Depth (m)	0.15	1.23	0.26
Conv. Total (m3/s)	612.5	Conv. (m3/s)	1.1	607.2	4.2
Length Wtd. (m)	91.76	Wetted Per. (m)	1.47	19.83	2.23
Min Ch El (m)	73.70	Shear (N/m2)	25.34	211.28	44.82
Alpha	1.04	Stream Power (N/m s)	16.99	711.61	43.94
Frctn Loss (m)	0.59	Cum Volume (1000 m3)	29.36	60.50	21.36
C & E Loss (m)	0.12	Cum SA (1000 m2)	14.12	39.51	19.46

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 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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 17

INPUT
Description: section15
Station Elevation Data num= 154

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	100.01	.09	100	1.44	99.84	2.47	99.74	3.06	99.63
3.56	99.6	4.2	99.51	5.3	99.28	5.67	99.2	5.88	99.16
6.48	98	6.98	98.78	8.41	96	9.89	97.28	10.13	97
11.71	96.31	12.2	96	13.33	95.37	13.65	95.23	14.19	95
14.64	94.77	14.94	94.62	15.15	94.54	15.32	94.47	16.19	94
16.76	93.66	18.21	93	19.12	92.53	20.4	92	22.22	91.1
22.95	91	24.17	90.54	24.48	90.43	24.98	90.24	25.62	90
27.06	89.45	27.56	89.26	27.74	89.18	28.17	89	28.33	88.93
30.71	88	30.91	87.91	33.3	87	34.23	86.69	35.25	86.41
38.51	86	37.48	85.69	39.5	85	40.05	84.81	42.39	84
43.1	83.76	45.3	83	46.06	82.87	49.39	82	51.38	81.49
53.23	81	55.63	80.06	55.76	80	56.04	79.86	57.65	79
58.32	78.63	59.68	78	61.28	77.14	61.46	77	63.08	76.41
63.77	76.18	63.87	76.14	64.14	76	64.47	75.88	64.67	75.79
65.3	75.54	66.69	75	67	74.85	68.72	74	69.84	73.35
70.58	73	72.09	72.26	72.6	72	73.63	71.54	74.7	71
75.65	70.72	76.11	70.51	77.61	70.07	77.83	70	78.2	70
78.63	70	78.91	70	84.32	69.57	85.7	69.53	87.31	69.45
87.76	69.44	88.27	69.42	94.5	69.6	94.8	69.59	95.23	69.63
95.53	69.64	95.91	69.67	96.58	69.69	97.2	69.72	97.51	69.73
98.39	69.76	101.67	69.96	101.72	69.96	101.8	69.96	102.19	70
103.99	70	104.6	70	108.05	70	108.4	70	108.57	70
108.92	70	108.99	70	109.1	69.9	109.32	69.833	112.25	69
115.1	68.26	115.56	68.14	116.07	68	116.37	67.94	116.45	67.93
116.72	67.89	117.11	67.83	119.63	67.4	122.47	67	126.14	67
128.69	67	130.37	67	131.52	67	131.94	67	132.46	67
132.97	67	134.18	67	134.45	67	135.96	67	137.16	67
138.3	67	138.78	67	138.83	67	140.57	67	142.71	67.2
145.05	68	146.94	68.48	148.27	69	149.69	69.65	150.19	69.89
150.49	70	151.36	70.32	152.01	70.53	153.01	71	153.16	71.09
154.76	72	155.43	72.41	156.44	73	158.66	73.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	109.32	.045	149.69	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
109.32	149.69	131.058	36.443	61.327	.1	.1

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	71.35	Element	Left OB	Channel	Right OB
Vel Head (m)	3.58	Wt. n-Val.		0.045	
W.S. Elev (m)	67.47	Reach Len. (m)	131.06	36.44	61.33
Crit W.S. (m)	68.12	Flow Area (m2)		9.74	
E.G. Slope (m/m)	0.458382	Area (m2)		9.74	
Q Total (m3/s)	81.66	Flow (m3/s)		81.66	
Top Width (m)	23.35	Top Width (m)		23.35	
Vel Total (m/s)	8.38	Avg. Vel. (m/s)		8.38	
Max Chl Dpth (m)	0.47	Hydr. Depth (m)		0.42	
Conv. Total (m3/s)	120.6	Conv. (m3/s)		120.6	
Length Wtd. (m)	36.44	Wetted Per. (m)		23.44	
Min Ch El (m)	67.00	Shear (N/m2)		1889.81	
Alpha	1.00	Stream Power (N/m s)		15842.59	
Frctn Loss (m)	4.35	Cum Volume (1000 m3)	19.34	38.25	15.35
C & E Loss (m)	0.30	Cum SA (1000 m2)	14.02	37.54	19.42

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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 11

INPUT
Description: section14
Station Elevation Data num= 148

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	96.5	.05	96.5	.39	96.52	3.9	96.81	4.27	96.84
4.44	96.86	4.63	96.87	5.47	99.91	5.55	96.9	8.73	94
9.21	95.64	9.29	95.61	9.39	95.78	9.65	95.72	9.86	95.72
10.87	95.1	11.7	95	12.11	94.91	12.99	94.74	16.35	94.74

17.42	94.01	17.68	94.0	18.53	94.93	18.64	94.9	19.02	95
19.88	95	20.61	95	21.68	94.34	22.4	93.91	23.87	93
24.09	92.53	25.59	92.41	26.78	92	28.27	91.52	29.8	91
31	90.41	32.74	90	34.17	90	34.37	90	34.56	90
34.84	90	35.17	90	35.64	90	36.76	89.68	37.49	89.46
38.92	89	39.33	88.82	40.92	88.12	41	88.09	41.17	88
41.74	87.85	42.55	87.12	42.7	87	43.09	86.93	43.13	86.92
43.22	86.91	43.42	86.88	43.95	86.8	47.06	86.28	49.39	86
49.84	85.9	49.97	85.87	50.2	85.79	52.3	85	52.38	84.97
52.72	84.92	54.52	84	55.45	83.55	56.71	83	57.62	82.59
58.82	82	59.63	81.53	60.47	81	62.19	80.05	62.29	80
62.41	79.93	64	79	64.92	78.5	65.78	78	66.97	77.37
67.63	77	68.76	76.49	69.57	76	71.03	75.2	71.39	75
71.76	74.81	73.31	74	74.1	73.54	75.07	73	76.06	72.44
76.83	72	77.73	71.49	78.63	71	80.16	70.13	80.39	70
80.52	69.93	80.89	69.73	82.16	69	83.34	68.34	83.94	68
85.32	67.23	85.71	67	87.02	66.26	87.53	66	88.68	66
89.38	66	92.69	66	94.32	66	94.46	65.98	94.69	66
100.26	66.73	101.41	67	107.25	67.8	107.5	67.82	108.55	68
108.86	68	111.87	68	116.39	68	128.63	68.83	129.88	68.86
130.88	68.96	131.38	69	134.4	69.33	136.38	69.55	138.92	69.83
139.45	69.89	139.94	69.94	140.08	69.94	140.42	70	141.67	70.32
143.02	70.66	143.49	70.77	144.35	71	145.46	71.36	147.24	72
148.62	72.52	149.84	73	150.17	73.1	152.73	74	153.48	74.21
153.63	74.25	153.87	74.33	154.5	74.49	155.32	74.74	156.17	75
157.95	75.24	159.87	76	160.33	76.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	83.34	.045	107.25	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
83.34	107.25	87.1	91.634	97.207	.1	.3

CROSS SECTION OUTPUT Profile #1007

E.G. Elev (m)	88.28	Element	Left OB	Channel	Right OB
Vel Head (m)	0.57	Wt. n-Val.		0.045	
W.S. Elev (m)	87.71	Reach Len. (m)	87.10	91.63	97.21
Crit W.S. (m)	87.72	Flow Area (m2)		25.07	
E.G. Slope (m/m)	0.019953	Area (m2)		25.07	
Q Total (m3/s)	84.01	Flow (m3/s)		84.01	
Top Width (m)	22.14	Top Width (m)		22.14	
Vel Total (m/s)	3.35	Avg. Vel. (m/s)		3.35	
Max Chl Dpth (m)	1.73	Hydr. Depth (m)		1.13	
Conv. Total (m3/s)	595.0	Conv. (m3/s)		595.0	
Length Wtd. (m)	91.23	Wetted Per. (m)		22.72	
Min Ch El (m)	85.98	Shear (N/m2)		215.75	
Alpha	1.00	Stream Power (N/m s)		722.94	
Frctn Loss (m)	1.21	Cum Volume (1000 m3)	29.34	57.27	21.35
C & E Loss (m)	0.10	Cum SA (1000 m2)	14.02	35.34	19.42

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 13

INPUT
Description: section13
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.99	1.18	87.15	1.42	87	2.6	86.65	3.78	86
5.28	85.22	5.62	85.04	5.69	85	5.75	84.96	6.07	84.77
7.84	84	8.75	83.63	9.26	83	9.94	82.4	10.945	82
11.62	81.6	12.69	81	13.75	80.23	13.89	80.13	14.09	80
14.39	79.87	16.01	79	17.05	78.38	17.63	78	18.82	77.27
19.28	77	20.79	76.10	20.78	76	20.85	75.95	20.87	75.94
20.92	75.91	21.06	75.87	22.44	75	22.69	74.87	24.91	74
24.91	73.85	24.82	73.79	25.55	73.53	25.93	73.41	26.21	73.36
26.5	73.3	27.02	73.17	28.49	73.13	29.47	73.06	29.68	73.04
29.85	73	31.83	72.88	33.94	72	34.82	71.8	35.48	71.64
38.42	71.23	37.94	71	38.08	70.97	38.13	70.95	38.27	70.91
39.06	70.53	40.48	70.1	41.22	70	41.94	69.76	42.46	69.59
42.81	69.47	44.08	69	45.32	68.59	48.09	68	50.78	67.22
51.42	67	51.82	66.87	52.17	66.74	52.82	66.42	53.83	66.34
53.24	66	56.01	67.1	53.21	65.83	54.91	65.49	58.5	65.01
58.52	65	58.55	65	59.3	64.8	62.42	64	65.80	63.1

66.12	63	66.56	63	66.74	63	67.17	63	67.96	63.13
72.29	64	76.78	64.09	77.29	65	79.14	65	79.58	65
80.22	64.89	80.86	64.77	84.88	64	89.35	63.12	90.52	63
92.42	62.4	94.11	62.42	94.23	62.43	96.58	62.99	96.61	63
98.82	63	98.3	63.24	98.84	63.29	99.52	63.15	100.92	63.5
103	63.75	104.98	64	105.44	64	105.46	64	105.75	64
106.11	64.07	106.2	64.08	107.81	64.23	109.14	64.39	108.65	64.48
109.53	64.84	110.09	64.73	110.9	64.87	111	64.89	111.64	65
112.87	65.06	112.3	65.12	113.2	65.34	113.78	65.47	116.17	66
116.5	66.08	119.74	67	120.17	67.13	122.62	68	124.5	68.63
125.89	69	128.99	69	130.43	69.5	130.54	69.53	130.94	69.5
131.27	69.53	131.62	69.52	132.19	69.51	132.56	69.5	133.53	69.51
133.94	69.49	134.11	69.48	134.81	69.46	136.8	69.41	137.21	69.39
137.55	69.38	137.67	69.39	138.13	69.39	138.46	69.41	138.97	69.47
139.45	69.52	140.15	69.42	141.64	69.9	143.22	70	143.76	70.06
144.99	70.21	145.83	70.31	146.11	70.35	146.87	70.43	147.64	70.55
148.13	70.61	148.9	70.77						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	79.14	.045	110.09	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
79.14	110.09	73.04	131.422	191.556	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	65.05	Element	Left OB	Channel	Right OB
Vel Head (m)	1.13	Wt. n-Val.	0.055	0.045	
W.S. Elev (m)	63.92	Reach Len. (m)	73.04	131.42	191.56
Crit W.S. (m)	64.28	Flow Area (m2)	8.67	13.90	
E.G. Slope (m/m)	0.077422	Area (m2)	4.67	13.90	
Q Total (m3/s)	84.01	Flow (m3/s)	14.88	69.13	
Top Width (m)	28.09	Top Width (m)	9.14	18.94	
Vel Total (m/s)	4.52	Avg. Vel. (m/s)	3.18	4.97	
Max Chl Dpth (m)	1.52	Hydr. Depth (m)	0.51	0.73	
Conv. Total (m3/s)	301.0	Conv. (m3/s)	53.5	248.5	
Length Wtd. (m)	137.[illegible]	Wetted Per. (m)	9.34	19.28	
Min Ch El (m)	62.40	Shear (N/m2)	379.45	547.02	
Alpha	1.08	Stream Power (N/m s)	1208.94	2723.85	
Frctn Loss (m)	3.19	Cum Volume (1000 m3)	29.14	95.49	21.16
C & E Loss (m)	0.06	Cum SA (1000 m2)	13.82	23.46	13.42

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 12

INPUT
Description: section12
Station Elevation Data num= 151

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	87.23	.07	87.2	.21	87	2.17	86.2	2.55	86.1
2.81	86.02	2.95	86	2.97	85.87	2.92	85.97	2.94	85.46
2.97	85.95	4.02	85.07	5.14	85.8	5.91	85	7.9	84.[illegible]
8.14	84.28	8.47	84.2	8.46	84.17	8.54	84.15	8.9	84.11
8.98	84	9.24	87.92	10.75	88	12.14	91.97	12.38	92.39
14.06	92	17.68	91.05	17.7	91	18.04	89.9	18.1	90.89
18.18	89.86	18.27	90.63	18.45	87.76	18.9	90.62	20.41	89.11
20.15	88	20.96	79.06	22.7	79.66	23.19	79	23.9	78.26
26.75	78	27.88	79.44	30.11	77	31.5	76.48	33.14	[illegible]
34.69	75.45	35.17	75.7	35.85	75	37.8	74.24	38.15	74.15
38.51	74	38.77	73.4	42.13	73	43.38	72.81	43.96	[illegible]
45.5	71	45.91	71	45.[illegible]	70.89	45.93	70.89	45.97	70.49
48.22	70	50.[illegible]	69.17	50.14	69.15	50.2	69.04	50.72	69.01
50.77	69.02	50.74	69.02	52.[illegible]	69.21	50.79	69	50.79	68.56
52.91	68	53.17	67.28	53.3	67	53.01	66.68	53.07	[illegible]
53.38	65.35	53.87	65.11	54.12	65	54.26	64.83	54.62	64.79
61.13	64	61.89	63.75	63.13	63	64.12	62.79	64.74	[illegible]
65.35	61.43	65.82	61	66.[illegible]	62.09	66.31	60	67.03	59.69
68.2	59	68.45	[illegible]	68.[illegible]	59.02	68.49	59.01	68.52	59.03
70.75	60	70.41	[illegible]	72.6	60.86	72.07	60.59	72.22	60.[illegible]
73.17	61	74.53	61.28	75.34	62	76.37	62.32	77.36	62.49
78.57	62.72	79.24	62.64	79.82	63	81.47	63.12	82.63	63.17
84.31	63.24	84.55	63.[illegible]	85.[illegible]	63.9	85.72	63.32	86.5	63.2
87.74	63.49	88.5	63.5	89.[illegible]	63.98	94.26	64	94.28	64
96.26	64.42	98.54	[illegible]	98.[illegible]	65.24	99.65	65.29	100.77	65.42
100.87	65.54	100.88	65.[illegible]	101.[illegible]	65.85	101.11	65.7	102.42	[illegible]
109.92	66.88	106.41	[illegible]	107.[illegible]	67.2	108.41	67.9	110.75	[illegible]

111.59	68.11	114.77	68.52	118.72	.69	121.12	69.21	121.68	69.23
122.73	69.34	125.11	69.53	130.86	.70	133.56	.70.2	138.96	.70.4
140.64	70.73	143.57	.71	145.38	71.14	148.34	71.41	150.31	71.5
150.78	71.54	151.87	71.63						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.13	.045	78.57	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
63.13	78.57	46.519	63.206	120.746	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	64.39	Element			
Vel Head (m)	0.11	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.28	Reach Len. (m)	46.52	63.21	120.75
Crit W.S. (m)	62.35	Flow Area (m2)	1.69	49.92	14.03
E.G. Slope (m/m)	0.001156	Area (m2)	1.69	49.92	14.03
Q Total (m3/s)	84.01	Flow (m3/s)	0.74	75.68	7.59
Top Width (m)	35.00	Top Width (m)	2.53	15.44	17.03
Vel Total (m/s)	1.28	Avg. Vel. (m/s)	0.44	1.52	0.54
Max Chl Dpth (m)	5.28	Hydr. Depth (m)	0.67	3.23	0.82
Conv. Total (m3/s)	2471.1	Conv. (m3/s)	21.6	2226.1	223.3
Length Wtd. (m)	68.83	Wetted Per. (m)	2.64	17.56	17.12
Min Ch El (m)	59.00	Shear (N/m2)	6.72	32.22	9.29
Alpha	1.28	Stream Power (N/m s)	2.93	48.84	5.03
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	28.91	51.29	20.01
C & E Loss (m)	0.03	Cum SA (1000 m2)	13.19	31.20	17.78

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 11

INPUT
Description: section11
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	74.25	.59	74	1.34	73.66	2.3	73	3.51	72.73
5.27	72	5.83	71.76	7.22	71.23	8.04	71	8.62	70.2
8.87	70.68	10.31	70.23	11.02	70	13.65	69.12	13.87	69.09
13.93	69.04	14.05	69	14.11	68.98	17.27	68	19.66	67.06
19.76	67	20.87	66.65	22.63	66	23.56	65.7	23.92	65.58
24.68	65.23	25.64	65	25.95	64.89	28.42	64	31.24	63.29
31.45	63	32.51	62.59	32.8	62.48	34.57	62	37.51	61.22
38.7	61	41.46	60.16	42.07	60	44.22	59.69	47.07	58.74
48.97	58.64	57.94	59	60.14	59	68.61	58.65	73.73	58.46
84.18	58	85.19	58	85.26	58	85.3	58	87.91	57.25
88.92	57	89	57	89.29	57	89.84	57	90.95	55.134
91.17	57.88	91.35	58	93.58	58.81	92.86	59	93.55	58.47
94.34	60	95.07	60.51	95.77	61	95.96	61.13	97.14	62
97.44	62.23	98.49	63	99.15	63.45	99.92	64	101.23	64.93
101.34	65	102.32	65.16	105.5	65.57	108.54	66	108.79	66.03
109.62	66.12	110.6	67.47	110.98	67.49	114.85	67.29	114.94	67.3
117.5	67.44	118	67.51	118.24	67.47	118.4	67.49	118.68	67.47
118.98	67.46	119.17	67.46	119.62	67.47	141.45	67.52	142.13	67.5
146.08	67.32	146.47	67.31						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	84.18	.045	90.95	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
84.18	90.95		64.201	63.21	72.565	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	64.35	Element			
Vel Head (m)	0.31	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.04	Reach Len. (m)	64.20	63.21	72.56
Crit W.S. (m)		Flow Area (m2)	261.85	46.35	31.71
E.G. Slope (m/m)	0.000963	Area (m2)	261.85	46.35	31.71
Q Total (m3/s)	1413.73	Flow (m3/s)	105.63	38.28	9.14
Top Width (m)	72.63	Top Width (m)	56.70	6.77	9.45
Vel Total (m/s)	3.42	Avg. Vel. (m/s)	0.40	0.83	0.29
Max Chl Dpth (m)	7.34	Hydr. Depth (m)	4.61	6.84	3.36
Conv. Total (m3/s)	17[illegible]	Conv. (m3/s)	18079.3	9585.3	1131.7
Length Wtd. (m)	65.00	Wetted Per. (m)	57.40	7.13	11.13
Min Ch El (m)	57.00	Shear (N/m2)	1.92	4.10	1.76
Alpha	1.14	Stream Power (N/m s)	1.18	1.60	0.51
Frctn Loss (m)	0.01	Cum Volume (1000 m3)	22.78	47.29	17.24
C & E Loss (m)	0.07	Cum SA (1000 m2)	11.82	30.2[illegible]	18.19

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 117

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.38	1.35	73.35	4.36	73.36	4.36	73.38
4.88	73.4	5.13	73.45	5.66	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	8.69	73.03	9.75	73.01	9.78	73
10.27	72.73	10.99	72.59	11.83	72.26	12.36	72.21	13.18	72.09
13.64	72	13.88	71.99	18.66	71.24	19.63	71.09	20.02	71.04
20.56	71.03	20.09	71.02	20.11	71.02	20.37	71	21.49	70.78
21.88	70.78	22.06	70.79	22.56	70.67	22.79	70.7	23.04	70.65
23.84	70.53	24.32	70.51	26.63	70	26.95	70	28.89	69.15
29.92	69	32.1	68.21	32.48	68.27	32.6	68.02	32.66	68
32.86	67.85	32.95	67.92	35.31	67	37.34	66.42	38	66
39.23	65.48	40.34	65	41.63	64.59	43.25	64	43.83	63.78
44.06	63.71	44.30	63.63	44.86	63.55	45.47	63.41	45.9	63.24
46.72	63.17	47.84	63	49.17	62.73	50.35	62.45	50.93	62.32
52.56	62	53.99	61.8	54.65	61.74	54.75	61.7	55.08	61.66
57.57	61.57	59.14	61.56	61.7	61.3	62.94	61.19	63.68	61.14
63.81	61.14	64.4	61.19	64.58	61.19	64.74	61.21	69.27	62
69.79	62.09	69.88	62.1	69.92	62.1	70.84	62.22	71.14	62.23
71.61	62.29	72.43	62.38	72.54	62.45	73.36	62.44	73.74	62.47
74.11	62.46	79.26	62	82.79	61.68	83.19	61.63	83.69	61.55
85.07	61.27	86.33	61	88.74	60.39	89.2	60.13	89.85	60
89.51	59.6	89.76	59	89.83	58.51	90.05	58	90.09	57.7
90.19	57.26	90.46	57.12	90.63	57	91.26	56.92	91.79	56.95
92.02	57	92.5	57.8	93.03	58	93.15	58.04	93.2	58
93.21	57.76	93.75	57.72	93.91	57.84	93.89	57.87	94.07	57.89
94.24	57.93	94.55	58	96.82	58.75	97.56	59	100.16	59.85
100.58	60	100.8	60.00	101.72	60.38	102.29	60.55	102.8	60.64
103.15	60.71	103.38	60.74	105.53	61	105.96	61.05	106.01	61.06
106.44	61.07	108.13	61.07	110.22	61.11	110.94	61.12	114.29	61.21
114.2	61.23	115.08	61.27	115.34	61.34	115.94	61.47	118.20	61.57
117.28	62	117.8	62.21	120.92	62.99	122.93	63	120.98	63
121.88	63.08	121.94	63.09	122.5	63.13	122.59	63.12	122.69	63.12
122.81	63.13	123.18	63.19	123.7	63.23	124	63.26	124.43	63.31
125.06	63.41	127.6	63.77	129.12	64	132.48	64.12	130.85	64.14
142.68	64.77	143.47	64.84	144.19	64.88	144.2	64.88	144.66	64.89
144.74	64.89	144.84	64.89	145.31	64.88	145.39	64.88	146.12	64.85
148.84	65	149.88	65	150.49	65	151.27	65	152	65
152.54	65	153.58	65	154.84	65	155.18	65	155.19	65
155.2	65	155.77	65	156.31	65	156.85	65	157.51	65
157.74	65	157.98	65	158.53	65	159.79	65	159.97	65
159.19	65	159.81	65	160.45	65	161.28	65	161.59	65
162.04	65	162.2	65	163.68	65	163.71	65	163.72	65
163.78	65	164.19	65	164.62	65	181.34	65.37	181.45	65.39
182.2	66	192.61	66	192.84	66	192.94	66	193.12	66
193.16	66	196.93	66.10						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
88.74	100.8	50.272	39.111	38.319	.1	.3

CROSS SECTION OUTPUT Profile #100\

E.G. Elev (m)	64.34	Element	Left OB	Channel	Right OB
Vel Head (m)	0.02	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	64.32	Reach Len. (m)	50.27	39.11	38.31
Crit W.S. (m)	61.01	Flow Area (m2)	107.75	70.06	48.25
E.G. Slope (m/m)	0.000250	Area (m2)	107.79	70.00	48.25
Q Total (m3/s)	141.77	Flow (m3/s)	50.58	63.77	29.38
Top Width (m)	92.75	Top Width (m)	46.13	32.00	13.36
Vel Total (m/s)	0.58	Avg. Vel. (m/s)	0.47	0.91	0.61
Max Chl Dpth (m)	7.40	Hydr. Depth (m)	2.33	2.20	2.05
Conv. Total (m3/s)	9693.4	Conv. (m3/s)	3411.1	4302.7	1981.6
Length Wtd. (m)	39.31	Wetted Per. (m)	46.94	35.23	13.82
Min Ch El (m)	57.02	Shear (N/m2)	4.95	9.31	4.35
Alpha	1.12	Stream Power (N/m s)	2.32	9.03	1.87
Frctn Loss (m)		Cum Volume (1000 m3)	10.92	43.81	13.62
C & E Loss (m)		Cum CA (1000 m2)	8.51	39.68	14.63

CULVERT

RIVER: 1
REACH: 1 PS: 4.5

INPUT
Description:
Distance from Upstream XS = 5
Deck/Roadway Width = 33.181
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
32.1	64.2		142.68	64.2	

Upstream Bridge Cross Section Data
Station Elevation Data num= 217

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.39	.22	73.38	1.25	73.35	4.06	73.36	4.36	73.36
4.69	73.4	5.13	73.45	5.65	73.55	6.09	73.57	6.58	73.61
6.91	73.57	7.07	73.47	8.69	73.03	9.75	73.01	9.78	73
10.29	72.73	10.99	72.58	11.83	72.26	12.36	72.21	13.18	72.09
13.64	72	13.88	71.89	18.66	71.24	19.63	71.09	20.02	71.04
20.06	71.03	20.09	71.02	20.11	71.02	20.37	71	21.69	70.78
21.88	70.78	22.06	70.79	22.58	70.67	22.79	70.7	23.04	70.69
23.84	70.53	24.32	70.51	26.63	70	26.95	70	28.89	69.35
29.92	69	32.1	68.21	32.48	68.07	32.6	68.02	32.66	68
32.86	67.95	32.95	67.92	35.91	67	37.34	66.42	38	66
39.23	65.48	40.34	65	41.68	64.59	43.25	64	43.83	63.78
44.06	63.71	44.38	63.63	44.86	63.55	45.47	63.41	45.9	63.34
46.72	63.17	47.54	63	49.17	62.72	50.35	62.45	50.92	62.32
52.56	62	53.89	61.8	54.56	61.74	54.75	61.7	55.09	61.66
57.67	61.57	59.14	61.56	61.7	61.3	62.94	61.19	63.69	61.14
63.82	61.14	64.4	61.19	64.56	61.19	64.74	61.21	69.27	62
69.78	62.09	69.88	62.1	69.88	62.1	70.94	62.22	71.14	62.23
71.61	62.23	72.43	62.38	72.94	62.45	73.36	62.44	73.74	62.47
74.11	62.46	79.26	62	82.79	61.68	83.18	61.63	83.69	61.55
85.07	61.27	86.33	61	88.74	60.39	89.2	60.13	89.35	60
89.51	59.6	89.76	59	89.83	58.51	90.05	58	90.09	57.7
90.35	57.26	90.46	57.12	90.83	57	91.26	56.92	91.79	56.95
92.02	57	92.5	57.6	93.03	58	93.15	58.04	93.2	58
93.51	57.76	93.73	57.72	93.91	57.64	93.99	57.87	94.07	57.89
94.24	57.93	94.53	58	96.82	58.75	97.56	59	100.16	59.85
100.59	60	100.8	60.08	101.72	60.39	102.29	60.55	102.8	60.64
103.15	60.71	103.36	60.74	105.53	61	105.96	61.05	106.01	61.06
106.06	61.07	106.13	61.07	110.22	61.11	110.94	61.12	114.29	61.21
114.5	61.23	115.08	61.27	115.34	61.34	115.94	61.47	116.26	61.57
117.28	62	117.8	62.51	120.92	62.99	120.93	63	120.95	63
121.88	63.08	121.94	63.07	122.5	63.13	122.59	63.12	122.69	63.12
122.81	63.12	123.18	63.19	123.7	63.23	124	63.26	124.43	63.31
125.06	63.41	127.6	63.77	129.11	64	130.48	64.12	130.85	64.14
142.68	64.77	143.47	64.84	144.16	64.88	144.2	64.88	144.66	64.89
144.74	64.89	144.84	64.89	145.31	64.88	145.39	64.88	146.12	64.83
148.84	65	149.86	65	150.49	65	151.27	65	152	65
152.54	65	153.56	65	153.84	65	155.18	65	155.19	65
155.2	65	155.73	65	156.31	65	156.85	65	157.51	65
157.74	65	157.98	65	158.53	65	158.78	65	158.97	65
159.19	65	159.81	65	160.85	65	161.28	65	161.59	65
162.04	65	162.2	65	162.66	65	163.01	65	163.32	65
163.78	65	164.19	65	164.66	65	191.36	65.97	191.45	65.97
192.5	66	192.61	66	192.84	66	192.94	66	193.11	66
193.16	66	196.01	66.18						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	88.74	.045	100.8	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
88.74	100.8	.1	.3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
12.31	64.2		170.3	64.2	

Downstream Bridge Cross Section Data
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.87	2.98	68.2	3.83	68	4.64	67.69	6.91	67
7.84	66.66	9.79	66	12.31	65.12	12.62	65	13.04	64.84
13.44	64.68	13.71	64.58	15.22	64	16.14	63.68	17.98	63
19.81	62.33	20.51	62	22.11	61.58	24.07	61	25.71	60.63
26.19	60.54	26.88	60.41	28.58	60.12	28.81	60.08	29.29	60
30.65	59.79	32.04	59.15	32.44	59.47	33.86	59.34	34.44	59.22
34.86	59.15	35	59.13	35.2	59.12	35.94	59	44.06	58.4
47.77	56	49.59	56	54.25	57.06	54.54	57	54.62	57
54.85	57	55.03	57	57.76	56.57	59.26	56.41	60.28	56.22
61.62	56	62.91	56	64.89	56	67.03	56.32	68.59	56.52
71.56	57	75.95	57.6	77.42	57.84	78.11	57.68	82.6	58
91.1	58.72	92.[illegible]	59.[illegible]	92.7	58.79	95.98	59.98	96.18	59
96.21	59	96.57	59.[illegible]	97.15	59.14	97.27	59.14	98.12	59.29

98.4	59.3	98.72	59.31	99.09	59.33	99.54	59.35	103.4	59.75
107.12	60	107.35	60	107.69	60	107.84	60	108.32	60
109.69	60.22	110.51	60.34	111.16	60.46	113.35	60.54	113.9	60.71
114.28	60.75	114.71	60.81	116.43	61	121.21	61.72	124.02	62
124.99	62.1	125.34	62.15	128.36	62.42	128.9	62.48	130.52	62.61
135.61	63	135.94	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.31	145.5	63.34	146.25	63.22	146.9	63.25	147.53	63.08
148.05	63	148.54	63	148.58	63	149.34	63.08	152.17	63.21
154.6	63.3	155.44	63.36	155.92	63.37	159.36	63.3	160.41	63.3
160.98	63.31	161.82	63.33	163.61	63.43	163.99	63.46	165.51	63.62
166.6	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.14	64.5	174.56	64.53	175.07	64.55	175.38	64.61
176.14	64.65	176.85	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.67	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	188.7	65.47	189.42	65.51	190.05	65.53
190.81	65.57	191.31	65.59	196.34	66	196.92	66	196.89	66
197.21	66	198.6	66	201.13	66.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	92.6	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
47.77	92.6	.1	.3

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 = 60.73
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	3.003	3.03

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

Culvert	Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
	5	33.181	.013	.013	0	.6	1

Number of Barrels = 2
Upstream Elevation = 57.9
Centerline Stations

Sta.	Sta.
91.15	94.45

Downstream Elevation = 56.45
Centerline Stations

Sta.	Sta.
61.26	64.56

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #1

Q Culv Group (m3/s)	137.02	Culv Full Len (m)	33.18
# Barrels	2	Culv Vel US (m/s)	7.32
Q Barrel (m3/s)	68.51	Culv Vel DS (m/s)	7.32
E.G. US. (m)	64.34	Culv Inv El Up (m)	57.90
W.S. US. (m)	64.32	Culv Inv El Dn (m)	56.45
E.G. DS (m)	58.80	Culv Frctn Ls (m)	1.45
W.S. DS (m)	58.70	Culv Exit Loss (m)	3.47
Delta EG (m)	5.54	Culv Entr Loss (m)	1.64
Delta WS (m)	5.11	Q Weir (m3/s)	6.51
E.G. IC (m)	64.79	Weir Sta Lft (m)	42.36
E.G. OC (m)	64.34	Weir Sta Rgt (m)	134.53
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (m)	63.49	Weir Max Depth (m)	0.18
Culv WS Outlet (m)	59.54	Weir Avg Depth (m)	0.13
Culv Nml Depth (m)	1.65	Weir Flow Area (m2)	12.31
Culv Crit Depth (m)	3.09	Min El Weir Flow (m)	64.20

Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 3

INPUT
Description: section3
Station Elevation Data num= 163

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	65.37	2.32	65.2	3.83	68	4.34	67.69	4.31	67
7.84	66.86	9.79	66	12.61	65.12	12.62	65	13.04	64.94

13.44	64.66	13.71	64.38	15.22	64	16.14	63.60	17.98	63
19.81	62.33	20.51	62	22.11	61.58	24.07	61	25.71	60.63
26.19	60.54	26.88	60.41	28.78	60.12	28.81	60.08	29.29	60
30.85	59.78	32.04	59.55	32.64	59.47	33.46	59.34	34.44	59.22
34.08	59.15	35	59.13	35.1	59.12	35.94	59	44.06	58.4
47.77	58	47.99	58	54.25	57.06	54.54	57	54.62	57
54.85	57	55.01	57	57.76	56.57	59.26	56.41	60.28	56.22
61.62	56	62.91	56	64.93	56	67.03	56.32	68.58	56.52
71.56	57	75.95	57.6	77.42	57.64	78.11	57.66	82.6	58
91.1	58.71	92.2	58.78	92.7	58.79	95.98	58.98	96.18	59
96.21	59	96.97	59.11	97.13	59.14	97.27	59.14	98.12	59.29
98.4	59.3	98.72	59.31	99.09	59.33	99.54	59.35	103.4	59.75
107.12	60	107.35	60	107.69	60	107.84	60	108.32	60
109.69	60.22	110.51	60.36	111.16	60.46	113.35	60.64	113.9	60.71
114.28	60.75	114.71	60.81	116.43	61	121.21	61.72	124.02	62
124.69	62.1	125.34	62.15	128.26	62.42	129.9	62.48	130.52	62.61
135.61	63	135.94	63.03	137.09	63.13	137.42	63.15	138.19	63.23
140.38	63.51	145.5	63.24	146.25	63.22	146.9	63.25	147.53	63.08
148.05	63	148.54	63	149.58	63	149.34	63.08	152.17	63.21
154.6	63.3	155.44	63.36	155.92	63.37	159.36	63.3	160.41	63.3
160.98	63.31	161.82	63.33	163.61	63.43	163.99	63.46	165.51	63.62
166.6	63.74	167.13	63.79	167.3	63.82	168.24	63.91	169.03	64
169.18	64.02	169.2	64.02	170.1	64.13	170.2	64.14	170.98	64.22
171.18	64.23	171.81	64.29	172.1	64.31	172.74	64.38	173.13	64.4
173.54	64.43	174.14	64.5	174.56	64.53	175.07	64.55	175.38	64.61
176.14	64.65	176.85	64.68	177.09	64.73	177.94	64.78	180.14	65
180.55	65	180.67	65	181.01	65	181.14	65	181.44	65.02
181.47	65.02	181.49	65.02	182.72	65.12	183.05	65.14	184.2	65.23
187.34	65.42	188.07	65.45	188.7	65.47	189.42	65.51	190.05	65.53
190.81	65.57	191.31	65.59	196.34	66	196.82	66	196.89	66
197.21	66	198.6	66	201.13	66.13				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	47.77	.045	82.6	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
47.77	82.6	87.755	79.88	79.044	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	58.80	Element	Left OB	Channel	Right OB
Vel Head (m)	0.80	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	58.20	Reach Len. (m)	87.75	79.88	79.04
Crit W.S. (m)	58.20	Flow Area (m2)	0.19	41.93	0.25
E.G. Slope (m/m)	0.018722	Area (m2)	0.19	41.93	0.25
Q Total (m3/s)	143.73	Flow (m3/s)	0.10	143.49	0.14
Top Width (m)	39.17	Top Width (m)	1.89	34.83	2.44
Vel Total (m/s)	3.39	Avg. Vel. (m/s)	0.54	3.42	0.54
Max Chl Dpth (m)	2.20	Hydr. Depth (m)	0.10	1.20	0.10
Conv. Total (m3/s)	1050.4	Conv. (m3/s)	0.8	1048.7	1.0
Length Wtd. (m)	80.21	Wetted Per. (m)	1.90	35.11	2.45
Min Ch El (m)	56.00	Shear (N/m2)	18.63	219.23	18.67
Alpha	1.02	Stream Power (N/m s)	10.08	750.26	10.12
Frctn Loss (m)	1.44	Cum Volume (1000 m3)	8.21	41.42	12.65
C & E Loss (m)	0.09	Cum SA (1000 m2)	7.30	28.76	14.13

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 0

INPUT
Description: section8
Station Elevation Data num= 100

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.94	1.83	68.81	2.09	68.8	2.28	68.79	2.51	66.77
2.74	68.76	3.61	66.68	4.54	66.43	7.71	66.34	11.35	66
18.64	65.27	19.44	65.16	20.02	65.02	20.66	65	22.75	64.66
23.19	64.57	24.18	64.4	24.63	64.33	25	64.26	25.79	64
26.4	63.76	29.41	63	29.76	62.45	30.85	62	31.87	61.42
32.54	61	33.61	60.3	34.13	60	34.58	59.72	35.98	59
37.76	58.09	37.82	58	38.13	57.8	38.17	57.88	39.41	57.22
39.82	57	41.28	56.52	41.82	56	43.31	56	43.38	56
43.74	56	44.35	56	51.59	56	52.18	56	57.46	56
58.02	56	58.37	56	58.68	56	59.05	56	60.02	56
60.54	56	60.35	56	61.12	56	80.16	55.3	81.8	55.23

86.4	55.05	87.51	55	88.38	55	90.25	55	93.96	55.63
94.87	55.79	95.24	55.85	96.49	56	98.03	56	98.11	56
103.28	56.32	103.91	56.36	105.56	56.45	113.54	57	115.71	57.53
116.26	57.58	116.52	57.6	116.89	57.63	124.67	58.75	133.02	58.97
133.15	59	133.94	59	134.04	59	134.31	59	137.46	59
139.29	59.04	140.3	59.07	140.32	59.07	141.15	59.12	141.9	59.16
142.17	59.19	142.95	59.24	143.14	59.3	146.7	59.6	147.64	59.75
147.89	59.76	148.79	59.92	149.26	60	150.51	60.17	153.43	60.46
153.97	60.49	154.39	60.51	154.86	60.54	155.36	60.56	155.85	60.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.46	.045	98.03	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.46	98.03	53.379	63.611	75.395	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	57.03	Element	Left OB	Channel	Right OB
Vel Head (m)	0.56	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	56.47	Reach Len. (m)	53.38	63.61	75.40
Crit W.S. (m)	56.58	Flow Area (m2)	7.06	37.56	1.81
E.G. Slope (m/m)	0.026775	Area (m2)	7.06	37.56	1.81
Q Total (m3/s)	143.73	Flow (m3/s)	12.15	129.55	2.03
Top Width (m)	64.33	Top Width (m)	15.98	40.57	7.78
Vel Total (m/s)	3.10	Avg. Vel. (m/s)	1.72	3.45	1.12
Max Chl Dpth (m)	1.47	Hydr. Depth (m)	0.44	0.93	0.23
Conv. Total (m3/s)	878.4	Conv. (m3/s)	74.2	791.7	12.4
Length Wtd. (m)	61.53	Wetted Per. (m)	16.04	40.67	7.79
Min Ch El (m)	55.00	Shear (N/m2)	115.51	242.52	60.97
Alpha	1.15	Stream Power (N/m s)	198.78	836.37	68.52
Frctn Loss (m)	1.76	Cum Volume (1000 m3)	7.89	38.25	12.57
C & E Loss (m)	0.01	Cum SA (1000 m2)	6.51	25.75	13.72

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 7

INPUT
Description: section7
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	63.02	.42	63	1.83	62.9	11.65	62.12	13.14	62.01
13.19	62	13.23	61.99	13.24	61.99	15.18	61.69	15.8	61.6
17.69	61.32	19.84	61.06	19.99	61.04	20.34	61	21.32	60.85
21.64	60.79	22.48	60.64	26.06	60	26.39	59.94	28	59.65
28.83	59.5	31.5	59	33.97	58.53	35.98	58	39.81	57.27
41.38	57	42.1	56.87	47.83	56	59.72	55.19	62.4	55
62.47	55	62.72	55	62.87	55	63.92	54.74	64.91	54.59
65.62	54.49	66.05	54.43	66.38	54.38	66.44	54.38	68.65	54.22
76.38	54	79.35	54	80.26	54	81.33	54	81.51	54.12
81.54	54.12	82.07	54.32	82.31	54.42	82.47	54.36	83.22	54.59
83.53	54.51	83.97	54.59	86.74	54.66	91.23	54.48	92.21	54.42
93.43	54.36	100.32	54.03	100.95	54	101.14	53.96	107.7	53.79
108.43	54	110.36	54.55	110.71	54.6	111.08	54.59	111.41	54.59
112.04	54.62	112.83	54.67	115.58	55	115.67	55	115.74	55
117.17	55.16	122.05	55.65	122.39	55.71	122.61	55.73	124.53	56
124.63	56	125.39	56	127.8	56	128.24	55.98	128.25	55.99
128.26	55.99	128.27	55.99	128.28	55.99	129.16	55.95	129.19	55.96
129.22	55.96	129.25	55.96	129.27	55.96	134.63	55.88	134.73	55.88
134.94	55.89	135.05	55.9	135.28	55.9	136.43	55.96		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	86.74	.045	110.36	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
86.74	110.36	77.74	135.126	210.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	55.85	Element	Left OB	Channel	Right OB
Vel Head (m)	0.21	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	55.64	Reach Len. (m)	77.74	135.13	210.39
Crit W.S. (m)	55.23	Flow Area (m2)	35.68	34.24	6.79
E.G. Slope (m/m)	0.006910	Area (m2)	35.68	34.24	6.79
Q Total (m3/s)	143.73	Flow (m3/s)	55.86	80.71	7.16
Top Width (m)	68.79	Top Width (m)	33.60	23.62	11.57
Vel Total (m/s)	1.87	Avg. Vel. (m/s)	1.57	2.36	1.06
Max Chl Dpth (m)	1.85	Hydr. Depth (m)	1.06	1.45	0.59
Conv. Total (m3/s)	1729.1	Conv. (m3/s)	672.0	970.9	86.2
Length Wtd. (m)	125.85	Wetted Per. (m)	33.84	23.75	11.83

Min Ch El (m)	53.79	Shear (N/m2)	71.44	97.69	39.55
Alpha	1.18	Stream Power (N/m s)	111.84	230.28	41.74
Frctn Loss (m)	1.39	Cum Volume (1000 m3)	6.75	35.97	12.25
C & E Loss (m)	0.01	Cum SA (1000 m2)	5.19	23.71	12.99

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

CROSS SECTION

RIVER: 1
REACH: 1 RS: 6

INPUT
Description: section6
Station Elevation Data num= 227

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.56	.2	59.52	1.41	59.3	1.71	59.24	2.93	59
3.56	58.86	4.36	58.71	7.02	58.29	8.75	58	9.06	57.92
9.16	57.89	10.42	57.51	10.73	57.44	13.72	57	15.57	56.7
20.68	56	22.55	55.76	22.7	55.73	22.83	55.71	22.98	55.68
23.2	55.65	23.47	55.61	23.86	55.57	24.32	55.54	24.72	55.53
25	55.5	25.37	55.5	25.8	55.47	26.62	55.39	27.29	55.32
28.19	55.22	29.38	55.09	30.23	55	30.53	54.97	30.57	54.97
31.63	54.87	32.54	54.82	33.11	54.8	33.65	54.78	34.31	54.75
37.11	54.65	37.91	54.62	38.53	54.59	39.07	54.58	39.59	54.56
40	54.54	40.39	54.5	40.86	54.48	41.29	54.44	42.46	54.36
42.81	54.33	43.14	54.3	43.44	54.29	43.77	54.29	43.98	54.28
44.19	54.28	44.58	54.27	44.86	54.27	56.19	54.01	56.2	54.01
56.21	54.01	56.22	54.01	56.23	54.01	56.24	54.01	56.25	54.01
56.26	54.01	56.4	54	62.83	53.83	62.78	53.82	62.93	53.82
63.09	53.81	65.85	53.69	66.15	53.7	67.77	-53.8	72.69	53.62
73.28	53.6	75.93	53.66	76.63	53.63	77.12	53.61	77.43	53.59
81.12	53.65	98.72	53	106.13	53	111.58	53	111.82	53
113.28	53	113.95	53	115.34	53	116.78	53	120.65	53
125.12	53.36	126.34	53.45	130.03	53.74	133.58	53.98	133.82	54
133.84	54	133.96	54	148.64	54.39	149.02	54.42	153.27	54.35
153.46	54.37	154.02	54.36	155.44	54.28	155.56	54.29	156.1	54.26
158.58	54	158.6	54	159.62	54	158.9	54	162.42	54.46
167.23	55	167.64	55	167.69	55	167.73	55	168.56	55
168.64	55	169.43	55	169.54	55	169.68	55	170.46	55
170.6	55	170.72	55	171.43	55	171.6	55	171.78	55
172.19	55	172.36	55	172.64	55	173.38	55	173.54	55
173.68	55	173.85	55	181.83	55.53	204.25	55.8	207.94	55.9
208.08	55.9	208.45	55.91	208.57	55.91	211.31	56	211.68	56.28
212.56	57	213.35	57.63	213.84	58	214.29	58.34	215.09	59
216.29	59.92	216.39	60	216.47	60.07	216.69	60.24	217.66	61
218.22	61.42	218.95	62	219.58	62.52	220.26	63	220.97	63.54
221.61	64	222.81	64.95	222.89	65	222.96	65.06	223.1	65.17
224.29	66	224.89	66.44	225.59	67	226.46	67.62	226.9	68
229.3	68.42	233.9	69	236.12	69.26	236.46	69.3	236.89	69.33
237.46	69.38	238.23	69.45	239.18	69.54	240.25	69.64	241.26	69.73
242.54	69.85	244.26	70	244.42	70	244.51	70	247.74	70.17
248.86	70.22	249.85	70.27	250.17	70.29	251.34	70.36	251.78	70.39
252.49	70.43	253.2	70.49	259.82	71	262.3	71	262.66	71
263.01	71	264.55	71	267.95	71	268.91	71	269.54	71
270.56	71	271.45	71	272.01	71	275.53	71	279.24	71
279.82	70.9	279.93	70.88	280.37	70.82	280.58	70.78	281.31	70.71
281.66	70.63	282.22	70.52	283.08	70.27	284.47	70.18	285.45	70.11
285.6	70.09	286.31	70.1	286.4	70.09	286.48	70.1	287.18	70.14
287.65	70.21	288.63	70.34	289.17	70.45	289.48	70.55	292.36	71
294.84	71.18	294.73	71.18	295.41	71.26	296.9	71.3	297.53	71.36
298.06	71.37	298.77	71.44						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	30.53	.045	181.83	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
30.53	181.83	40.348	115.83	209.385	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	54.45	Element	Left OB	Channel	Right OB
Vel Head (m)	0.29	Wt. n-Val.		0.045	
W.S. Elev (m)	54.16	Reach Len. (m)	40.35	115.83	209.39
Crit W.S. (m)	54.13	Flow Area (m2)		60.65	
E.G. Slope (m/m)	0.020385	Area (m2)		60.65	
Q Total (m3/s)	143.73	Flow (m3/s)		143.73	
Top Width (m)	93.80	Top Width (m)		93.80	
Vel Total (m/s)	2.37	Avg. Vel. (m/s)		2.37	
Max Chl Dpth (m)	1.16	Hydr. Depth (m)		0.65	
Conv. Total (m3/s)	1007.2	Conv. (m3/s)		1007.2	
Length Wtd. (m)	124.87	Wetted Per. (m)		93.89	

Min Ch El (m)	53.00	Shear (N/m2)		129.01		
Alpha	1.00	Stream Power (N/m s)		305.72		
Frctn Loss (m)	0.60	Cum Volume (1000 m3)	5.36	29.55	11.53	
C & E Loss (m)	0.06	Cum SA (1000 m2)	3.88	15.78	11.78	

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: 5

INPUT
Description: section5
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.08	.18	58	1.56	57.42	2.57	57	4.31	56.28
5.03	56	6.07	55.56	6.25	55.49	6.49	55.39	6.82	55.26
7.26	55.07	7.43	55	8.26	54.63	9.03	54.28	9.27	54.17
9.66	54	9.83	53.93	10.04	53.84	11.76	53	13.65	52.13
13.91	52	15.45	52	16.13	52	24.4	52	24.73	52
25.07	52	25.82	52	29.82	52	30.51	51.65	32.1	51
33.57	51	33.85	51	34.2	51	35.85	51.21	39.43	51.6
40.39	51.69	40.84	51.73	41.72	51.8	42.48	51.87	42.59	51.88
42.88	51.9	42.97	51.91	43.14	51.92	44.16	51.95	44.29	51.95
44.33	51.96	45.09	51.96	45.2	51.96	46.95	52	48.27	52
49.16	52	49.33	52	50.91	52	51.11	52	51.9	52
54.02	52	55.2	52	55.62	52	56.39	52	56.88	52
59.4	52	74.85	52.84	75.33	52.86	76.34	52.89	76.55	52.9
78.04	52.94	78.52	52.96	78.57	52.96	79.41	53	79.51	53
80.32	53	80.39	53	81.82	53	84.33	53	84.45	53
84.71	53	86.91	53	87.72	53	88.49	53	92.48	53
94.23	53	95.13	53	96.06	53.07	96.85	53.08	99.21	53.16
99.91	53.19	100.32	53.18	102.69	53.26	103.15	53.26	109.86	53.42
110.07	53.43	120.68	53.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	29.82	.045	44.16	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
29.82	44.16	120.276	71.551	24.002	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	53.79	Element	Left OB	Channel	Right OB
Vel Head (m)	0.09	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.71	Reach Len. (m)	120.28	71.55	24.00
Crit W.S. (m)		Flow Area (m2)	30.22	32.30	68.42
E.G. Slope (m/m)	0.002088	Area (m2)	30.22	32.30	68.42
Q Total (m3/s)	143.73	Flow (m3/s)	33.19	55.68	54.86
Top Width (m)	105.38	Top Width (m)	19.50	14.34	72.13
Vel Total (m/s)	1.10	Avg. Vel. (m/s)	1.10	1.72	0.80
Max Chl Dpth (m)	2.71	Hydr. Depth (m)	1.55	2.25	0.95
Conv. Total (m3/s)	3145.2	Conv. (m3/s)	726.4	1218.4	1200.4
Length Wtd. (m)	65.86	Wetted Per. (m)	19.89	14.60	72.17
Min Ch El (m)	51.00	Shear (N/m2)	31.12	45.30	19.41
Alpha	1.39	Stream Power (N/m s)	34.18	78.10	15.57
Frctn Loss (m)	0.10	Cum Volume (1000 m3)	4.75	24.17	4.37
C & E Loss (m)	0.00	Cum SA (1000 m2)	3.49	9.51	4.22

CROSS SECTION

RIVER: 1
REACH: 1 RS: 4

INPUT
Description: section4
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	57.04	.51	57	1.23	57	2.32	57	4	57
6.96	57	11.65	56.23	13.07	56	14.07	55.83	14.24	55.8
14.48	55.76	14.8	55.7	15.21	55.64	16.11	55.49	16.72	55.38
17.83	55.19	18.68	55.01	18.7	55.01	18.73	55	19.81	54.78
20.94	54.51	21.63	54.36	22.1	54.25	22.41	54.18	22.61	54.14
22.73	54.11	23.21	54	25.84	53.39	27.6	53	29.03	52.71
30.25	52.4	31.99	52	32.05	52	32.11	52	37.67	51.59
45.87	51	50.44	51	51.66	51	51.88	51	52.37	51
61.96	51.33	64.49	51.41	66.37	51.47	74.58	51.68	82.76	51.86

42.08	51.86	94.9[illegible]	[illegible]	[illegible]	52.07	88.93	52.16	94.66	52.63
58.58	49	102.7	[illegible]	[illegible]	54	111.33	54.1		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	37.67	.045	71.15	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
37.67	74.58	[illegible]	54.387	41.471	.1	.3

CROSS SECTION OUTPUT Profile #107

			Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]	Element			
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	[illegible]	Reach Len. (m)	67.85	54.39	41.47
Crit W.S. (m)		Flow Area (m2)	15.96	85.96	37.43
E.G. Slope (m/m)	0.001189	Area (m2)	15.96	85.96	37.43
Q Total (m3/s)	153.[illegible]	Flow (m3/s)	11.47	115.60	26.53
Top Width (m)	[illegible]	Top Width (m)	12.79	36.91	31.04
Vel Total (m/s)	1.10	Avg. Vel. (m/s)	0.72	1.34	0.71
Max Chl Dpth (m)	2.91	Hyar. Depth (m)	1.25	2.33	1.21
Conv. Total (m3/s)	4457.1	Conv. (m3/s)	332.9	3354.3	769.8
Length Wtd. (m)	[illegible]	Wetted Per. (m)	13.98	36.94	31.11
Min Ch El (m)	[illegible]	Shear (N/m2)	14.32	27.10	14.01
Alpha	1.22	Stream Power (N/m s)	10.30	36.45	9.93
Frctn Loss (m)	0.02	Cum Volume (1000 m3)	1.98	19.94	3.10
C & E Loss (m)	0.02	Cum SA (1000 m2)	1.55	7.68	2.99

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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section
Station Elevation Data num= [illegible]

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	56.74	[illegible]	[illegible]	[illegible]	56.14	7.42	56	5.27	55.21
2.77	55	7.09	54.1	[illegible]	54.04	8.11	54	8.41	53.87
10.44	53	11.[illegible]	[illegible]	13.[illegible]	52	15.47	51.89	16.02	51.86
17.45	51.77	18.58	[illegible]	22.98	51.44	35.58	51	38.18	51
39.33	51	48.44	51	[illegible]	51	54.38	51	55.08	51
55.37	51	56.58	51	[illegible]	51	58.78	51	59.24	51
59.[illegible]	51	59.88	51	[illegible]	51	66.02	51	68.54	51
70.81	51	74.61	51	[illegible]	51	92.61	51	94.8	51
97.75	51	98.[illegible]	51	[illegible]	51	103.88	51	103.49	51
103.54	51	114.[illegible]	[illegible]	[illegible]	51.02	117.21	52	126.57	52.62

Manning's n Values num= [illegible]

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	15.47	.045	114.[illegible]	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
15.47	114.13	[illegible]	41.901	57.302	.1	.3

CROSS SECTION OUTPUT Profile #100

			Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]	Element			
Vel Head (m)	[illegible]	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	[illegible]	Reach Len. (m)	27.56	41.90	57.30
Crit W.S. (m)		Flow Area (m2)	7.19	247.78	17.50
E.G. Slope (m/m)	0.000[illegible]	Area (m2)	7.19	247.78	17.50
Q Total (m3/s)	[illegible]	Flow (m3/s)	1.97	147.44	5.53
Top Width (m)	[illegible]	Top Width (m)	6.50	98.77	12.33
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)	0.27	0.60	0.32
Max Chl Dpth (m)	[illegible]	Hyar. Depth (m)	1.11	2.51	1.42
Conv. Total (m3/s)	10[illegible]	Conv. (m3/s)	135.9	10162.6	380.8
Length Wtd. (m)	[illegible]	Wetted Per. (m)	6.79	98.82	13.37
Min Ch El (m)	[illegible]	Shear (N/m2)	2.19	5.18	2.70
Alpha	[illegible]	Stream Power (N/m s)	0.60	3.08	0.85
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)	1.19	10.87	1.96
C & E Loss (m)	[illegible]	Cum SA (1000 m2)	0.89	3.99	2.09

Warning: The cross-section end points need 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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section1
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4.27	57	9.13	57	12.55	56.77	14.1	56.03	14.44	56.02
14.47	56.01	14.53	56	14.62	55.98	14.69	55.98	18.63	55
22.37	54.15	22.44	54	23.44	53.86	27.47	53	29.91	52.53
30.28	52.34	31.34	52.17	32.13	52	37.1	51.47	42.18	51
42.2	51	42.25	51	42	51	43.81	51	43.88	52
49.58	50.64	52.16	50.53	53.19	50.47	53.86	52.43	54.31	50.27
56.13	50.3	57.55	50.2	57.89	50.2	60.18	52.08	61.63	53
62.58	55	63.4	56	64.22	60	64.57	60	65.55	60.11
66.57	60.26	72.3	61	73.2	61	73.57	61.1	74.62	61.7
75.05	61.5	77.22	62	79.33	63.45	80.85	62.32	82.20	63
82.19	63.02	87.13	64	87.2	64.01	90.74	64.17	91.73	64.13
94.77	64	95.91	63.73	99.75	63	102.58	63	103.97	63
104.91	63.29	104.14	63.15	110.3	64	113.41	64.65	113.87	64.69
114.3	64.73	115.14	64.85	116.24	65	116.27	65	118.65	65.1
120	65.44	120.47	65.56	121.88	65.66	122.27	65.73	124.34	65
124.85	64.46	125.35	64.14	125.9	64.23	126.67	63.63		

Manning's n Values num= 3

Sta	n Val	dis	n Val	Sta	n Val
0	.055	42.85	.045	72.83	.055

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
42.85 72.83 [illegible] 48.881 69.949 .1 .1

CROSS SECTION OUTPUT Profile #1007

E.G. Elev (m)	53.63	Element	Left OB	Channel	Right OB
Vel Head (m)	0.08	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	53.55	Reach Len. (m)	30.01	49.88	49.95
Crit W.S. (m)		Flow Area (m2)	28.07	52.4	23.23
E.G. Slope (m/m)	0.000010	Area (m2)	28.07	52.4	23.23
Q Total (m3/s)	159.46	Flow (m3/s)	16.76	122.27	20.38
Top Width (m)	29.27	Top Width (m)	27.80	29.94	21.49
Vel Total (m/s)	1.12	Avg. Vel. (m/s)	0.70	2.33	0.88
Max Chl Dpth (m)	1.55	Hydr. Depth (m)	1.50	1.77	1.09
Conv. Total (m3/s)	1370.6	Conv. (m3/s)	144.1	1051.2	175.3
Length Wtd. (m)	47.44	Wetted Per. (m)	28.22	32.7	22.67
Min Ch El (m)	50.00	Shear (N/m2)	12.68	27.21	5.73
Alpha	1.27	Stream Power (N/m s)	8.93	77.81	5.04
Frctn Loss (m)	0.07	Cum Volume (1000 m3)	0.70	2.3	0.91
C & E Loss (m)	0.01	Cum SA (1000 m2)	0.26	1.21	0.29

Warning: Divided flow computed for this cross-section.
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.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section1
Station Elevation Data num= [illegible]

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	58.42	1.84	58.42	4.14	56.7	6.88	57.42	9.78	57.1
7.15	56.48	8.47	56.2	12.27	16.51	16.00	16.45	16.71	16.
19.84	16.1	20.19	16	21.74	15.87	24.74	15.45	24.7	15.
24.97	15.55	25.44	15.4	26.48	15.4	26.74	15.14	27.14	15.
28.15	15.11	28.44	15.1	29.21	15	29.48	14.98	30.49	14.
30.84	14.77	31.21	14.62	32.21	14.14	33.15	14.1	33.74	14
34.92	13.74	37.24	13.16	40.24	13	40.89	12.88	41.14	12.
41	12.69	42.3	12.3	43.24	12.15	44.13	12.13	44.1	12.
48.72	12.23	49.17	12.24	49.64	12.23	47.88	12.21	51.12	12.2
52.07	12.15	54.27	12	55.47	12	58.06	12	58.21	12
58.44	12	59.34	12	59.7	12	59.59	12	60.12	12
61.03	12	63.17	12.12	63.64	12	63.85	12	64.54	12
64.94	12	67.34	12	68.2	12	69.48	12.1	70.14	12
70.15	12.27	70.49	12.4	71.4	12	67.96	12.21	68.64	12
68.83	12.12	69.2	12	69.7	14.69	70.53	15	71.4	17.2
71.94	19.88	72.3	21.5	73.2	26	75.47	24.12	76.3	23
100.54	23.11	102.29	19	104.12	19.4	107.58	19	108.36	19.1
108.69	19.24	108.74	19.2	109.1	19.12	109.31	19.18	110.04	19.2
111.41	19.78	112.3	20	114.12	20.18	116.06	21	117.46	21.2
122.13	22	123.13	22.14	124.4	22	127.01	21.44	130.24	21
131.88	22.46	132.7	24.2	133.2	24.5	132.6	24.7	133.54	25
134.98	25.21	136.29	25.14	136.28	25.83	137.28	25.39	137.24	25.14
137.7	24.94	138.3	24	139.1	24	139.34	24.35	140.4	24
140.47	26.21	141.3	27.2	143.1	28.75	144.56	27	146.17	27.1
146.19	27.21	150	27.1	152.71	27.89				

Manning's n Values num=

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	57.36	.045	60.48	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
57.36	60.48	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Element	Left OB	Channel	Right OB
E.G. Elev (m)	53.55		Wt. n-Val.	0.055	0.045	0.055
Vel Head (m)	0.21		Reach Len. (m)			
W.S. Elev (m)	51.34		Flow Area (m2)	18.88	61.10	7.07
Crit W.S. (m)	52.47		Area (m2)	18.88	61.10	7.07
E.G. Slope (m/m)	0.002687		Flow (m3/s)	17.41	131.78	5.75
Q Total (m3/s)	154.94		Top Width (m)	19.42	23.12	8.63
Top Width (m)	31.17		Avg. Vel. (m/s)	0.92	2.16	0.81
Vel Total (m/s)	1.70		Hydr. Depth (m)	0.97	2.64	0.82
Max Chl Dpth (m)	1.34		Conv. (m3/s)	335.8	2542.1	110.9
Conv. Total (m3/s)	2988.8		Wetted Per. (m)	19.52	23.85	8.83
Length Wtd. (m)			Shear (N/m2)	25.49	67.31	21.11
Min Ch El (m)	50.00		Stream Power (N/m s)	23.50	145.60	17.16
Alpha	1.29		Cum Volume (1000 m3)			
Frctn Loss (m)			Cum CA (1000 m2)			
C & E Loss (m)						

SUMMARY OF MANNING'S N VALUES

River:1

Reach	River Sta.	n1	n2	n3
:	20	.055	.045	.055
:	19	.055	.045	.055
:	18	.055	.045	.055
:	17	.055	.045	.055
:	16	.055	.045	.055
:	15	.055	.045	.055
:	14	.055	.045	.055
:	13	.055	.045	.055
:	12	.055	.045	.055
:	11	.055	.045	.055
:	10	.055	.045	.055
:	9.1	Culvert		
:	9	.055	.045	.055
:	8	.055	.045	.055
:	7	.055	.045	.055
:	6	.055	.045	.055
:	5	.055	.045	.055
:	4	.055	.045	.055
:	3	.055	.045	.055
:	2	.055	.045	.055
:	1	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: 1

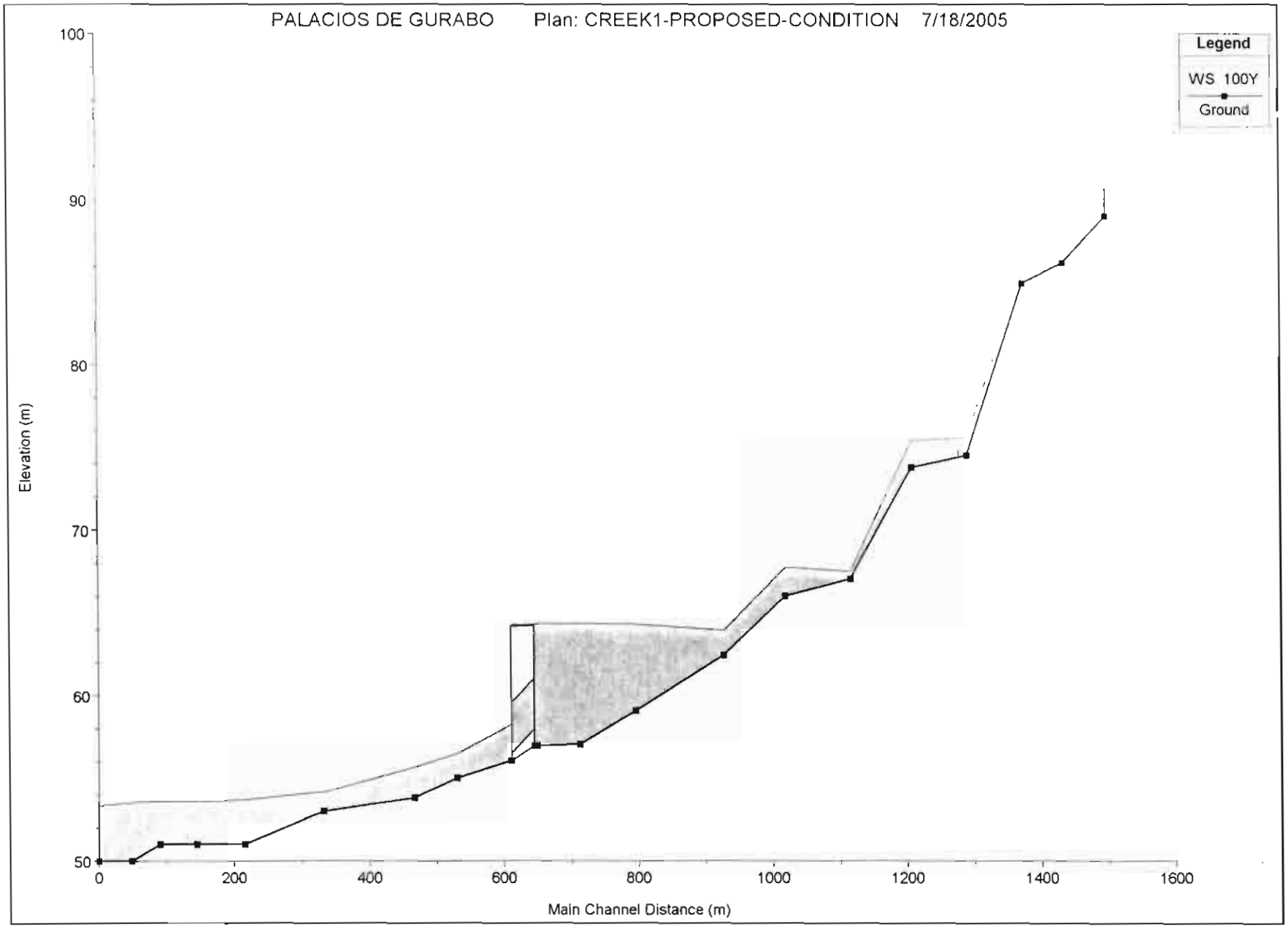
Reach	River Sta.	Left	Channel	Right
:	20	64.481	64.086	67.410
:	19	59.858	65.564	70.963
:	18	83.006	83.675	83.193
:	17	83.254	82.13	81.9
:	16	140.1	91.99	39.866
:	15	131.058	96.443	41.927
:	14	87.1	91.634	97.007
:	13	77.06	121.422	191.554
:	12	46.919	83.209	117.746
:	11	24.201	63.11	72.965
:	10	60.272	39.511	28.313
:	9.1	Culvert		
:	9	67.795	79.88	79.044
:	8	51.379	63.611	75.195
:	7	77.74	135.124	210.385
:	6	40.348	115.81	209.385
:	5	120.276	73.551	24.002
:	4	67.853	54.387	41.472
:	3	37.523	41.801	57.302
:	2	30.056	48.641	69.949
:	1	0	0	0

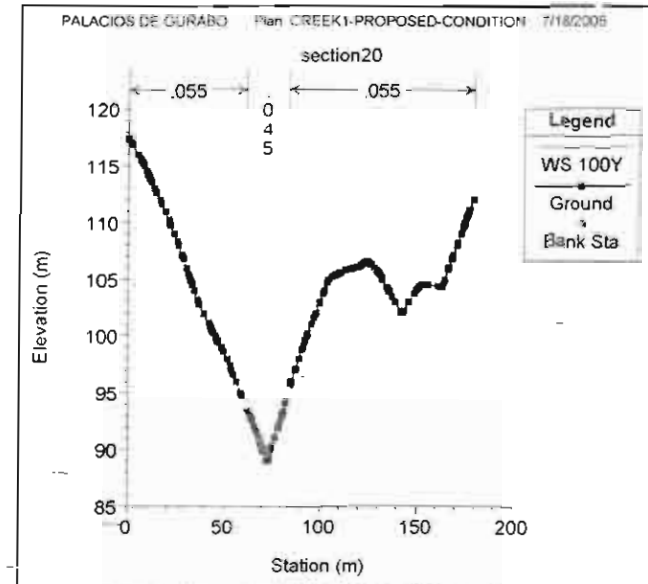
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1

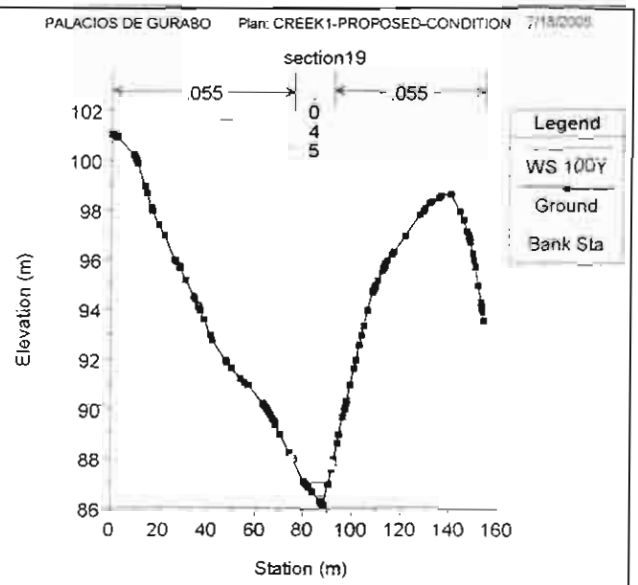
Reach	River Sta.		Contr.	Expan.
1	20		.1	.3
1	19		.1	.3
1	18		.1	.3
1	17		.1	.3
1	16		.1	.3
1	15		.1	.3
1	14		.1	.3
1	13		.1	.3
1	12		.1	.3
1	11		.1	.3
1	10		.1	.3
1	9.5	Culvert		
1	9		.1	.3
1	8		.1	.3
1	7		.1	.3
1	6		.1	.3
1	5		.1	.3
1	4		.1	.3
1	3		.1	.3
1	2		.1	.3
1	1		.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Total Q (cfs)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (sq m)	Top Width (m)	Froude # Chl
1	20	100Y	21.27	89.00	90.[illegible]	90.7[illegible]	91.[illegible]	0.022721	3.08	[illegible]	[illegible]	1.[illegible]
1	19	100Y	21.27	86.17	87.38	87.42	88.[illegible]	0.121247	4.69	[illegible]	[illegible]	1.[illegible]
1	18	100Y	21.27	84.92	85.[illegible]	85.[illegible]	[illegible]	0.027325	2.03	[illegible]	[illegible]	1.[illegible]
1	17	100Y	21.34	74.44	75.[illegible]	76.19	[illegible]	0.173967	7.08	[illegible]	[illegible]	1.79
1	16	100Y	21.27	73.[illegible]	75.[illegible]	75.[illegible]	[illegible]	0.017775	3.17	[illegible]	[illegible]	[illegible]
1	15	100Y	21.08	67.00	67.47	68.[illegible]	[illegible]	0.458399	6.[illegible]	[illegible]	[illegible]	1.[illegible]
1	14	100Y	[illegible]	65.[illegible]	[illegible]	[illegible]	[illegible]	0.019911	1.35	[illegible]	[illegible]	[illegible]
1	13	100Y	[illegible]	62.40	[illegible]	64.[illegible]	[illegible]	0.077422	4.97	[illegible]	[illegible]	1.[illegible]
1	12	100Y	[illegible]	58.00	64.[illegible]	62.[illegible]	[illegible]	0.001156	1.[illegible]	[illegible]	[illegible]	[illegible]
1	11	100Y	[illegible]	57.00	64.[illegible]		[illegible]	0.000065	0.61	[illegible]	[illegible]	[illegible]
1	10	100Y	[illegible]	56.92	[illegible]	[illegible]	[illegible]	0.000220	0.81	[illegible]	[illegible]	[illegible]
1	9.5		Culvert									
1	9	100Y	[illegible]	56.00	58.[illegible]	58.[illegible]	[illegible]	0.019[illegible]	3.42	[illegible]	[illegible]	[illegible]
1	8	100Y	[illegible]	55.00	56.47	56.[illegible]	[illegible]	0.026775	3.45	[illegible]	[illegible]	1.[illegible]
1	7	100Y	[illegible]	53.79	[illegible]	[illegible]	[illegible]	0.006910	2.[illegible]	[illegible]	[illegible]	[illegible]
1	6	100Y	[illegible]	53.00	54.[illegible]	54.[illegible]	[illegible]	0.020665	2.[illegible]	[illegible]	[illegible]	1.94
1	5	100Y	[illegible]	51.00	53.71		[illegible]	0.002088	1.72	[illegible]	[illegible]	[illegible]
1	4	100Y	[illegible]	51.00	53.[illegible]		[illegible]	0.001198	1.34	[illegible]	[illegible]	[illegible]
1	3	100Y	[illegible]	51.00	53.[illegible]		[illegible]	0.000210	0.[illegible]	[illegible]	[illegible]	[illegible]
1	2	100Y	[illegible]	50.00	53.[illegible]		[illegible]	0.000830	1.35	[illegible]	[illegible]	[illegible]
1	1	100Y	[illegible]	50.00	53.[illegible]	[illegible]	[illegible]	0.002997	2.16	[illegible]	[illegible]	[illegible]


PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005
Legend
WS 100Y
Ground
Elevation (m)
100
90
80
70
60
50
0
200
400
600
800
1000
1200
1400
1600
Main Channel Distance (m)


PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005
section20
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)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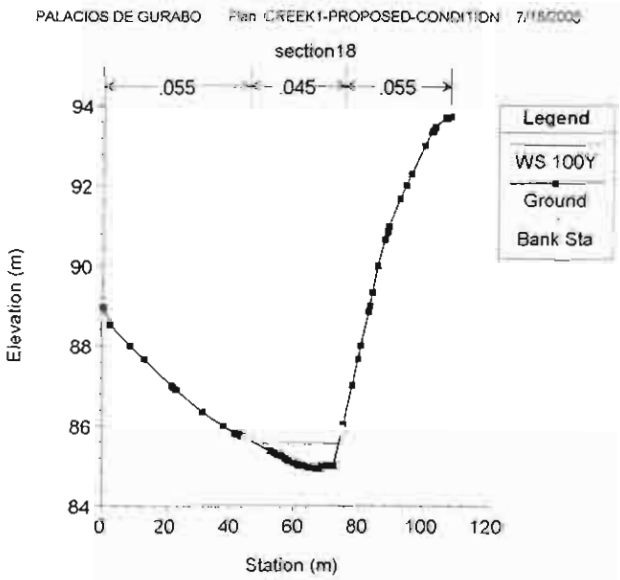
section19
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)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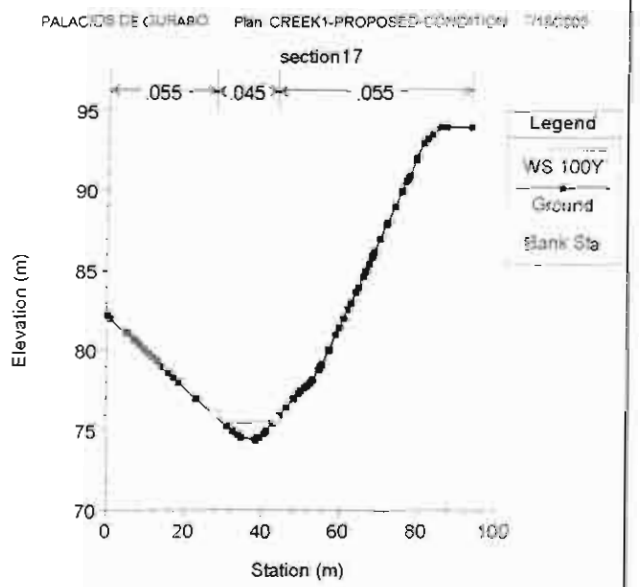
section18
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)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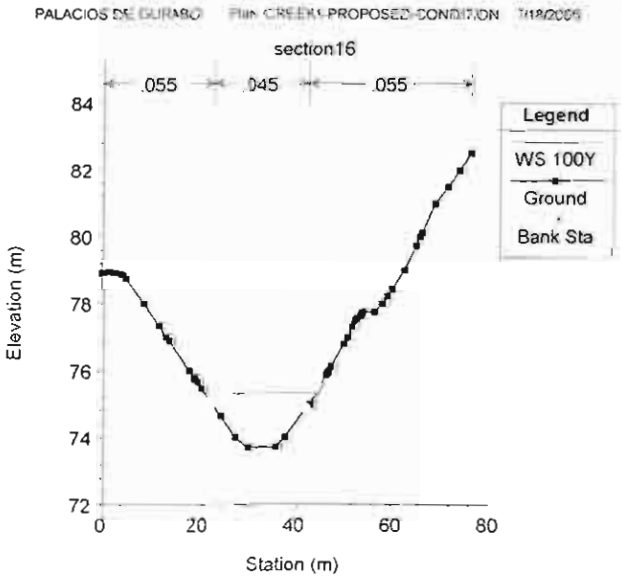
section17
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)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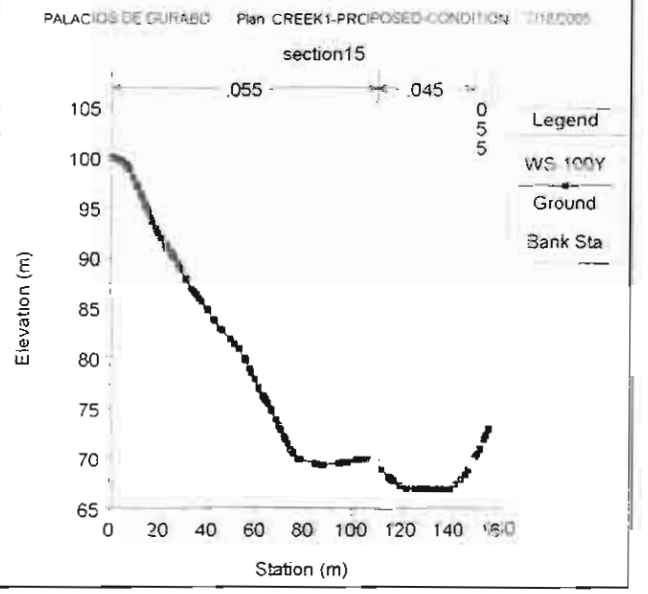
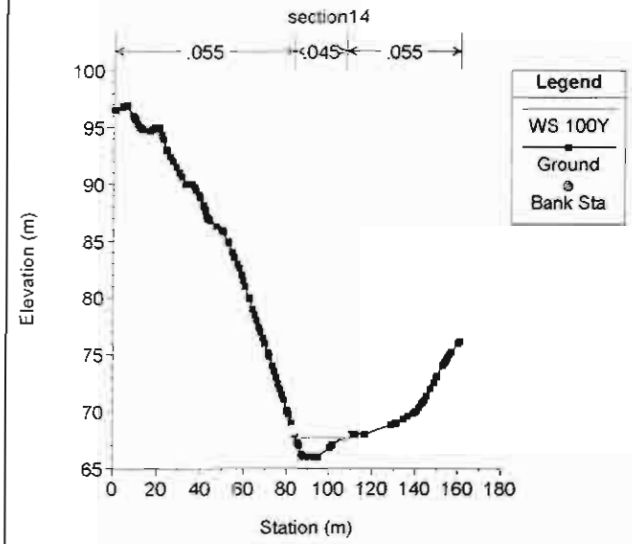
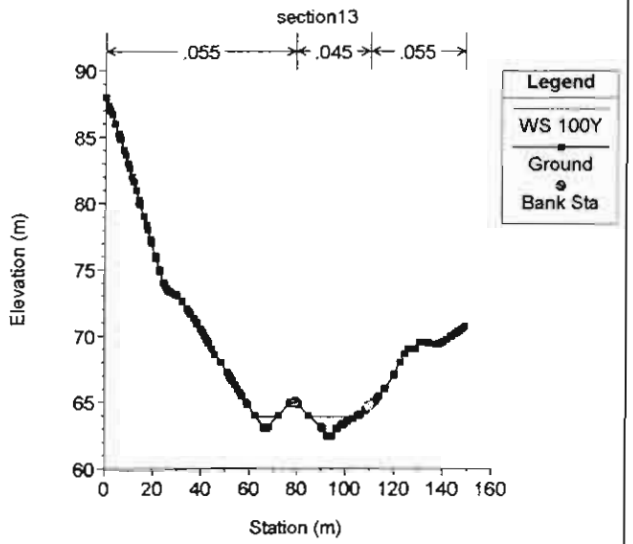
section16
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)


PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005
section15
.055
.045
.055
Legend
WS 100Y
Ground
Bank Sta
Elevation (m)
Station (m)

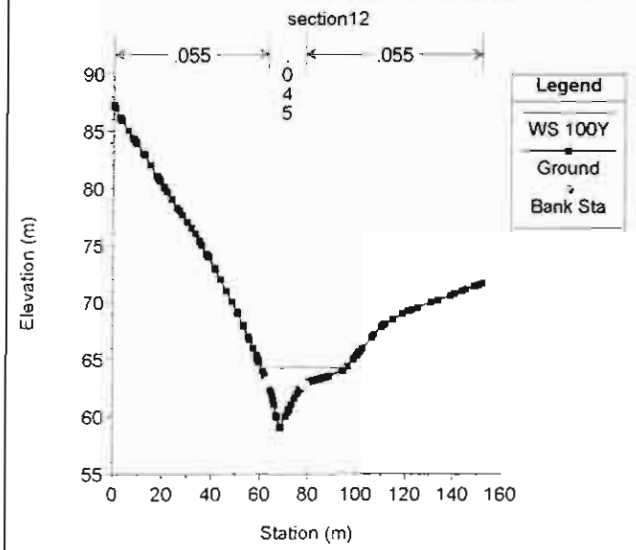
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



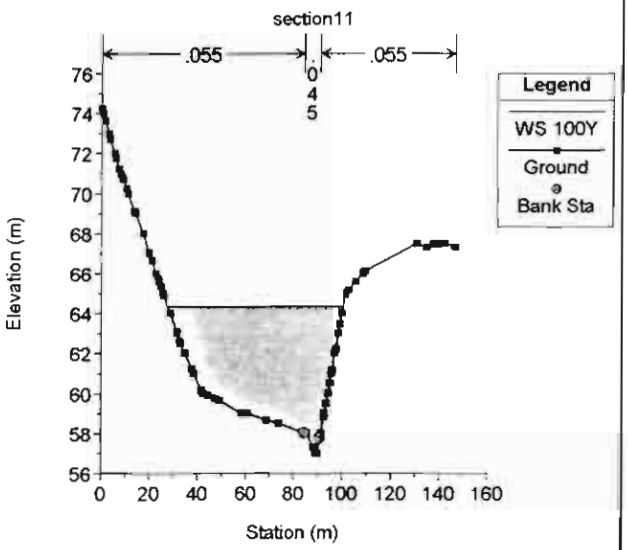
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



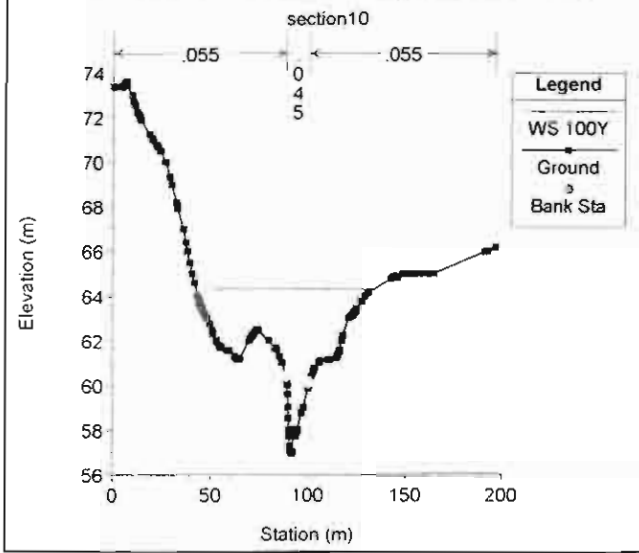
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



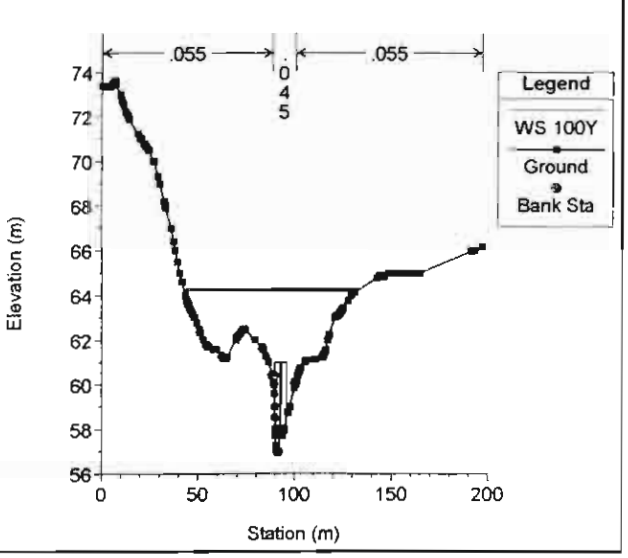
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



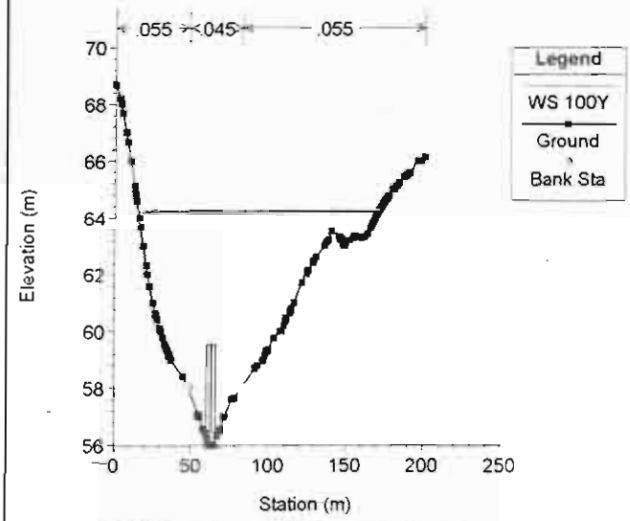
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

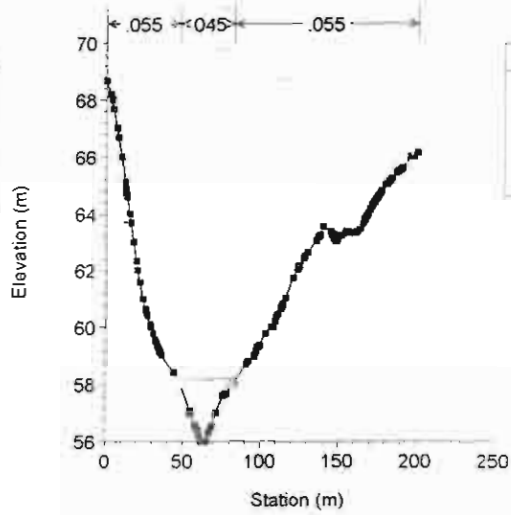


PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



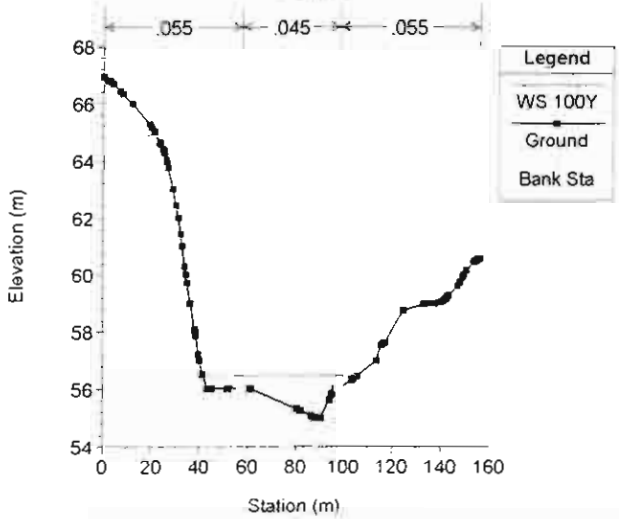
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

section9



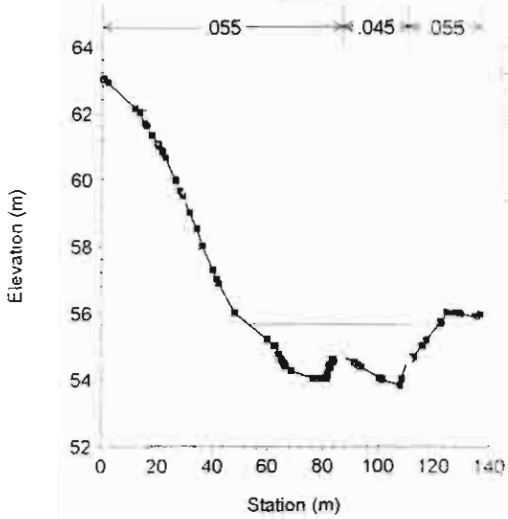
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

section8



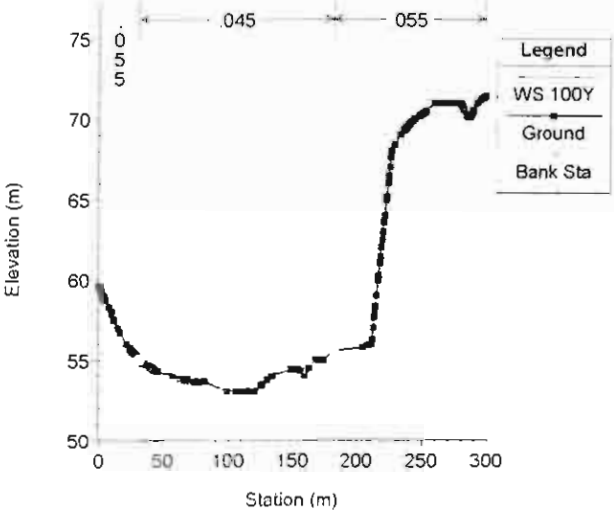
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

section7



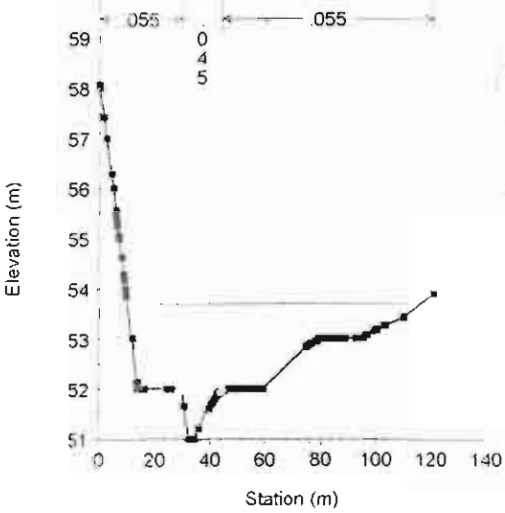
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

section6

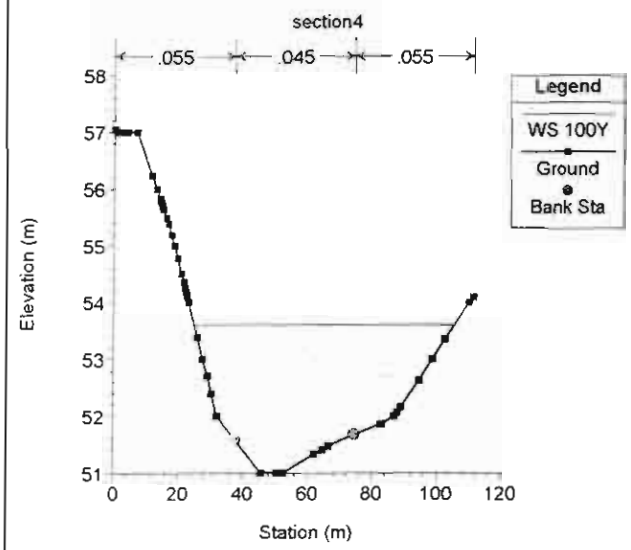


PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005

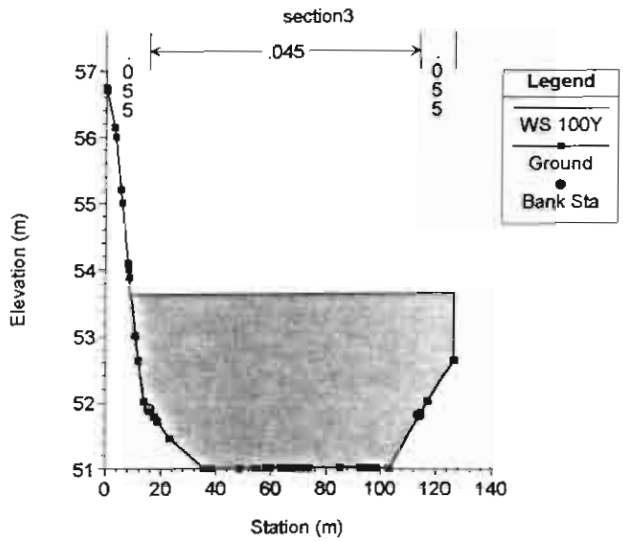
section5



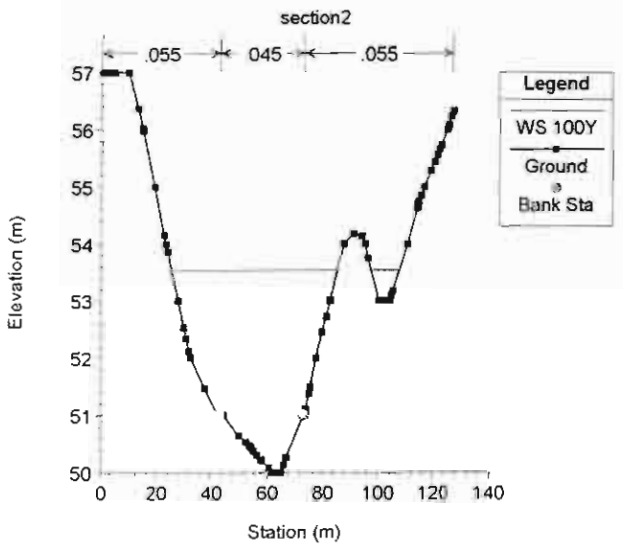
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



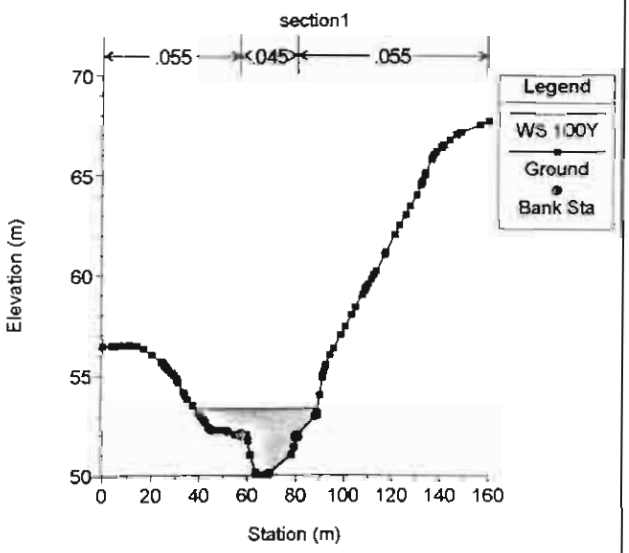
PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



PALACIOS DE GURABO Plan: CREEK1-PROPOSED-CONDITION 7/18/2005



HEC-RAS Version 3.1.1 May 2003
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
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PROJECT DATA
Project Title: PALACIOS DE ZURABO
Project File : CREEK1.prj
Run Date and Time: 7/18/2005 2:46:44 PM

Project in SI units

PLAN DATA

Plan Title: CREEK2-PROPOSED-CONDITION
Plan File : p:\278-Palacios de Zurabo\HEC-RAS\CREEK1.p04

Geometry Title: CREEK2-PROPOSED-CONDITION
Geometry File : p:\278-Palacios de Zurabo\HEC-RAS\CREEK1.g04

Flow Title : CREEK2-PROPOSED-CONDITION
Flow File : p:\278-Palacios de Zurabo\HEC-RAS\CREEK1.f04

Plan Summary Information:
Number of: Cross Sections = 10 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.003
Critical depth calculation tolerance = 0.002
Maximum number of iterations = 20
Maximum difference tolerance = 0.1
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At cross sections and bridges only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: CREEK2-PROPOSED-CONDITION
Flow File : p:\278-Palacios de Zurabo\HEC-RAS\CREEK1.f04

Flow Data (m3/s)

River	Reach	RS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	1	10	10.48	8.55	7.82	[illegible]	[illegible]
2	1	9	16.12	14.77	14.01	13.[illegible]	[illegible]
2	1	8	22.[illegible]	24.4[illegible]	7.48	18.[illegible]	[illegible]

Boundary Conditions

River	Reach	[illegible]	Upstream	Downstream
2	1	[illegible]	Critical	Normal S = 0.00[illegible]
2	1	[illegible]	Critical	Normal S = 0.00[illegible]
2	1	[illegible]	Critical	Normal S = 0.00[illegible]
2	1	[illegible]	Critical	Normal S = 0.00[illegible]
2	1	[illegible]	Critical	Normal S = 0.00[illegible]

GEOMETRY DATA

Geometry File: [illegible]
Geometry File : p: [illegible] of [illegible]\HEC-RAS\CREEK1.g04

CROSS SECTION

RIVER: 2
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	78.28	1.31	78.10	4.07	78.13	6.28	78	9.08	77.82
10.33	77.42	14.06	77.4	16.27	77.39	17.12	77.34	17.48	77.32
20.73	77.03	21.09	77	22.12	76.87	24.26	76.61	24.91	76.52
25.37	76.47	31.07	76	33.81	75.7	34.15	75.67	34.46	75.65
34.81	75.63	35.24	75.6	36.29	75.52	36.89	75.48	37.41	75.43
38.1	75.4	38.52	75.37	39.16	75.34	40.2	75.27	41.04	75.24
41.41	75.2	42.39	75.18	45.18	75	45.54	75	46.74	74.72
47.40	74.53	49.36	74	49.59	73.91	51.69	73	52.39	72.78
54.33	72.16	54.83	72	56	71.104	56.69	71.53	58.83	71
61.5	70.35	62.91	70	63.55	70	64.4	70	64.69	70
75.69	70	76.2	70	76.82	70	77.6	70	78.19	70
78.85	70.3	79.57	70.45	80.33	71	80.67	71.15	82.5	72
82.52	72.009	83.91	72.66	84.68	73	86.23	73.71	86.89	74
88.09	74.54	88.54	74.76	89.05	75	89.35	75.14	89.72	75.3
91.29	76	92.79	76.53	93.33	77	94.92	77.63	95.77	78
98.51	78.88	98.81	78	99.59	79.22	99.86	79.28	100.41	79.41
101.84	79.72	103.21	80	104.39	80.26	105.42	80.47	106	80.58
108.33	81	110.18	81.41	111.84	82	112.83	82.54	113.91	83
114.67	83.37	116.03	84	117.07	84.49	117.79	84.83	118.17	85
120.35	85.98	120.38	85.94	120.39	86	120.4	86	120.41	86.01
121.89	86.8								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	54.83	.045	82.12	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
54.83	82.12	82.12	55.55	26.77	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	72.53	Element			
Vel Head (m)	0.00	Wt. n-Val.	0.055	0.045	0.055
W.S. Elev (m)	72.53	Reach Len. (m)	82.12	55.55	26.77
Crit W.S. (m)	70.35	Flow Area (m2)	0.43	57.56	0.29
E.G. Slope (m/m)	0.000026	Area (m2)	0.43	57.56	0.29
Q Total (m3/s)	10.49	Flow (m3/s)	0.02	10.46	0.01
Top Width (m)	85.44	Top Width (m)	1.85	27.69	1.10
Vel Total (m/s)	0.18	Avg. Vel. (m/s)	0.04	0.18	0.04
Max Chl Depth (m)	2.53	Hydr. Depth (m)	0.16	2.08	0.26
Conv. Total (m3/s)	1019.5	Conv. (m3/s)	3.1	1049.4	2.0
Length Wtd. (m)	59.57	Wetted Per. (m)	1.73	28.38	1.22
Min Ch El (m)	70.00	Shear (N/m2)	0.06	0.52	0.06
Alpha	1.32	Stream Power (N/m s)	0.00	0.09	0.00
Frctn Loss (m)	0.00	Cum Volume (1000 m3)	2.30	12.76	0.68
C & E Loss (m)	0.00	Cum SA (1000 m2)	2.06	16.01	1.37

CROSS SECTION

RIVER: 2
REACH: 1 RS: 10

INPUT
Description: section10
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	77	1.49	[illegible]	5.51	77	7.84	76.91	7.51	76.89
8.95	76.81	9.53	76.74	9.78	76.52	12.33	76.38	12.65	76.35
13.26	76.33	13.43	76.32	16.72	76.09	19.27	76	19.88	76
20.82	76	21.35	76	22.22	76	23.07	76	23.98	75.96
24.42	75.92	25.67	75.12	27.12	75	27.86	74.86	28	74.84
28.19	74.84	29.82	74.53	31.26	74.49	30.82	74.43	31.22	74.38
31.5	74.36	31.82	74.32	32.12	74.3	32.32	74.28	32.53	74.26
32.75	74.25	33.44	74.18	37.74	70.83	38.85	70.44	40.12	70.23
42.24	70.91	43.73	71.03	44.56	71.51	44.88	71.66	45.83	71.93
46.4	72.03	46.67	72.16	48.28	72.18	49.66	72	50.53	71.89
50.78	71.85	51.43	71.74	52.67	71.92	53.18	71.81	54.06	71.99
54.11	72	54.37	72	54.67	72	55.38	72	56.86	72
57.22	72	57.[illegible]	72	58.55	72.45	60.38	72.61	61.06	72.75
61.68	72.86	62.39	73	64.17	73.34	65.38	73.59	66.2	73.73
67.67	74	68.95	74.12	69.14	74.23	69.33	74.22	69.5	74.23
69.76	74.25	70.12	74.3	71.2	74.4	72.66	74.41	73.76	74.39
74.32	74.4	78.12	[illegible]	79.49	74.23	78.6	74	80.75	74
82.49	74	87.[illegible]	[illegible]	[illegible]	73	90.56	72.07	90.94	72

91.5	72	94.82	71.24	96.25	71.5	99.47	71.1	100.41	71.24		
100.82	71.16	101.39	71.03	101.5	71	102.03	70.56	103.85	70.53		
104.5	70	104.[illegible]	[illegible]	108.41	69	109.53	69	110.44	69		
110.66	69	111.83	69.38	112.4	69.58	113.03	69.71	113.31	69.78		
113.48	69.82	114.3	69.96	113.53	69.96	114.86	70	115.62	70.1		
116.34	70.21	118.78	70.61	119.7	70.65	120.16	70.74	120.41	70.79		
121.54	70.93	121.61	70.94	121.92	71	124.23	71.45	124.67	71.5		
126	71.74	126.54	71.83	127.38	72	127.67	72.01	127.69	72.02		
128.72	72.15	128.[illegible]	72.24	130.89	72.28	131.47	72.3	134.18	72.3		
139.49	72.52	140.[illegible]	72.56	141.34	72.6	141.91	72.64	142.29	72.68		
143.35	73	144.03	73	145.06	73.34	147.22	74	151.13	74.97		
151.25	75	151.32	75.02	151.36	75.03	153.16	75.47	153.81	75.62		
154.15	75.69	155.79	76	161.25	76.96	161.43	77	162.88	77.20		
168.38	77.37	169.79	78	168.02	78.52	170.02	79	171.82	79.43		
172.14	79.5										

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	102.93	.045	118.78	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
102.93	118.78	22.404	30.943	40.021	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Element	Left OB	Channel	Right OB
E.G. Elev (m)	72.51		Wt. n-Val.	0.055	0.045	0.055
Vel Head (m)	0.00		Reach Len. (m)	22.40	30.94	40.02
W.S. Elev (m)	72.52		Flow Area (m2)	37.52	44.28	13.71
Crit W.S. (m)	70.09		Area (m2)	37.52	44.28	13.71
E.G. Slope (m/m)	0.000034		Flow (m3/s)	3.79	11.27	1.16
Q Total (m3/s)	16.19		Top Width (m)	39.43	15.35	10.82
Top Width (m)	76.10		Avg. Vel. (m/s)	0.10	0.25	0.08
Vel Total (m/s)	0.17		Hydr. Depth (m)	0.95	2.79	0.85
Max Chl Dpth (m)	2.52		Conv. (m3/s)	445.8	1323.4	137.3
Conv. Total (m3/s)	1934.0		Wetted Per. (m)	40.74	16.24	10.97
Length Wtd. (m)	30.94		Shear (N/m2)	0.31	0.32	0.27
Min Ch El (m)	69.00		Stream Power (N/m s)	0.03	0.23	0.02
Alpha	1.65		Cum Volume (1000 m3)	0.56	2.93	0.89
Frctn Loss (m)			Cum XA (1000 m2)	0.69	16.30	1.08

CULVERT

RIVER: 2
REACH: 1 RS: 28.5

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = 24.05
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 2

Sta Hi Cord	Lo Cord	Sta Hi Cord	Lo Cord
10	74.5	151.17	74.1

Upstream Bridge Cross Section (WS=
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	77	2.44	77	3.51	77	7.34	76.91	7.51	76.93
8.95	76.91	9.55	76.94	9.94	76.92	12.52	76.98	12.65	76.[illegible]
13.28	76.33	13.43	76.[illegible]	16.77	76.29	19.31	76	19.44	76
20.02	76	21.73	76	22.12	76	23.07	76	23.98	76.[illegible]
24.42	75.52	25.67	75.[illegible]	27.11	75	27.89	74.86	28	74.84
29.53	74.64	29.82	74.55	30.28	74.49	30.82	74.43	31.22	74.[illegible]
31.5	74.36	32.01	74.32	32.11	74.3	32.32	74.29	32.53	74.[illegible]
32.15	74.25	32.64	74.[illegible]	37.74	70.83	38.85	70.44	40.12	[illegible]
42.34	70.31	43.93	71.04	44.54	71.51	44.88	71.66	45.83	71.93
46.4	72.03	46.47	72.[illegible]	48.28	72.18	49.64	72	50.53	71.89
50.78	71.85	51.48	71.79	52.07	71.82	52.18	71.81	54.00	71.[illegible]
54.11	72	54.57	72	54.67	72	55.08	72	56.88	[illegible]
57.22	72	57.[illegible]	72	59.15	72.45	60.18	72.61	61.08	72.75
61.88	72.86	62.38	73	64.17	73.34	65.38	73.59	66.2	73.7[illegible]
67.87	74	68.44	74.1[illegible]	69.14	74.19	69.33	74.21	69.5	74.[illegible]
69.76	74.25	70.72	74.[illegible]	72.2	74.4	72.64	74.43	72.78	74.29
74.02	74.5	74.29	74.3	74.49	74.33	78.6	74	80.75	74
82.49	74	85.92	74.[illegible]	86.22	73	90.14	72.57	90.94	72
91.3	72	94.82	71.24	95.25	71.5	99.47	71.1	100.41	71.24
100.82	71.16	101.39	71.03	101.5	71	102.03	70.56	103.85	70.53
104.5	70	104.[illegible]	[illegible]	108.41	69	109.53	69	110.44	69
110.66	69	111.83	69.38	112.4	69.58	113.03	69.71	113.31	69.78
113.48	69.82	114.3	69.96	113.53	69.96	114.86	70	115.62	70.1
116.34	70.21	118.78	70.61	119.7	70.65	120.16	70.74	120.41	70.79
121.54	70.93	121.61	70.94	121.92	71	124.23	71.45	124.67	71.5
126	71.74	126.54	71.83	127.38	72	127.67	72.01	127.69	72.02
128.72	72.15	128.[illegible]	72.24	130.89	72.28	131.47	72.3	134.18	72.3
139.49	72.52	140.[illegible]	72.56	141.34	72.6	141.91	72.64	142.29	72.68

143.35	73	144.03	[illegible]	145.04	73.34	147.22	74	151.13	74.97
151.25	75	151.32	[illegible]	151.36	75.03	153.18	75.47	153.81	75.62
154.15	75.69	155.79	76	161.25	76.96	161.47	77	162.88	77.26
163.36	77.37	165.39	78	168.02	78.52	170.82	79	171.82	79.43
172.24	79.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	102.95	.045	118.78	.055

Bank Sta: Left Right Coeff Contr. Expan.
102.95 118.78 .1 .3

Downstream Deck/Roadway Coordinates
num= 2

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
28.72	74.5		171.79	74.5	

Downstream Bridge Cross Section Data
Station Elevation Data num= 135

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	79.18	.22	79.16	.79	79.12	1.07	79.09	1.24	79.08
1.43	79.06	2.11	78	2.74	78.94	3.92	78.82	6.21	78.63
11.9	78	16.34	77.51	20.99	77	26.5	76.28	28.73	76
35.18	75.24	36.92	75	38.82	74.7	43.55	74	44.48	73.73
47.1	73	48.39	72.82	49.71	72	52.36	71.08	52.57	71
52.79	70.93	53.1	70.78	55.2	69.9	56.21	68.45	58.33	68.45
61.15	69.96	62.03	70.31	62.13	70.43	62.23	70.47	62.27	70.55
62.42	70.6	62.58	70.64	63.6	71	67.3	71.74	68.42	72
69.35	72.26	71.11	73.59	73.03	73	73.22	73	74.32	73
77.09	73	77.38	73	78.59	73.2	79.68	73.4	85.49	73.52
86.45	73.38	87.49	73.23	88.26	73	88.35	73	88.42	73
89.69	73	89.72	73	89.73	73	89.75	73	89.84	73
89.85	73	91.05	73	91.56	73	92.64	73	99.67	73
101.13	73	109.97	73	112.31	72.47	112.64	72.36	113.13	72.29
113.62	72.18	114.72	72	116.65	71.59	119.44	71	121.23	70.56
121.7	70.44	122.74	70.21	123.77	70	124.18	69.87	124.23	69.84
124.47	69.64	125.1	69.5	125.43	69.35	125.64	69.23	126.13	68.93
127.11	67.83	128.14	67.76	129.17	67.84	130.26	69.34	130.59	69.63
130.8	69.77	130.86	69.82	131.08	70	131.45	70.11	132.15	70.26
132.96	70.4	133.45	70.52	133.94	70.61	135.56	70.89	135.7	70.91
136.24	71	136.95	71.17	139.57	71.75	141.15	72	144.52	72.41
145.58	72.57	146.39	72.65	146.41	72.7	148.69	73	153.93	73.52
155.73	73.62	156.36	73.66	156.48	73.69	162.62	73.87	162.8	73.88
164	73.93	164.24	73.95	164.44	73.97	164.48	73.97	165.2	74
167.41	74.31	168.65	74.48	171.79	74.92	172.37	75	172.46	75.01
173.33	75.13	173.66	75.17	174.61	75.3	175.3	75.4	175.88	75.48
176.22	75.53	176.54	75.57	176.62	75.61	179.61	76	182.42	76.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	119.44	.045	135.56	.055

Bank Sta: Left Right Coeff Contr. Expan.
119.44 135.56 .1 .3

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 = 74.5
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 2

Culvert Name Shape Rise Span
Culvert #2 Circular 1.22
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
.5	27.[illegible]	.013	.013	0	.6	1

Upstream Elevation = [illegible].24
Centerline Station = 11.[illegible]
Downstream Elevation = [illegible]
Centerline Station = [illegible]

Culvert Name Shape Rise Span
Culvert #1 Circular 1.22
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG

Culvert Upstrm Dist	Length	Top n	Bottom n	Depth Blocked	Entrance Loss Coef	Exit Loss Coef
.5	[illegible]	.013	.013	0	.6	1

Upstream Elevation = [illegible]
Centerline Station = [illegible]
Downstream Elevation = [illegible]
Centerline Station = [illegible]

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #2

Q Culv Group (m3/s)	5.44	Culv Full Len (m)	
# Barrels	1	Culv Vel US (m/s)	3.02
Q Barrel (m3/s)	5.44	Culv Vel DS (m/s)	6.89
E.G. US. (m)	72.53	Culv Inv El Up (m)	70.24
W.S. US. (m)	71.22	Culv Inv El Dn (m)	68.81
E.G. DS (m)	69.53	Culv Frctn Ls (m)	0.52
W.S. DS (m)	69.15	Culv Exit Loss (m)	2.09
Delta EG (m)	3.00	Culv Entr Loss (m)	0.40
Delta WS (m)	1.27	Q Weir (m3/s)	
E.G. IC (m)	72.48	Weir Sta Lft (m)	
E.G. OC (m)	72.22	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	71.47	Weir Max Depth (m)	
Culv WS Outlet (m)	69.33	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.59	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.23	Min El Weir Flow (m)	74.50

Warning: At least one culvert in the culvert group has supercritical flow at the outlet. However, since more than one culvert in the culvert group has flow, the program cannot determine if the downstream cross section should be subcritical or supercritical flow. The program used the downstream supercritical answer, even though it may not be valid.

CULVERT OUTPUT Profile #100Y Culv Group: Culvert #1

Q Culv Group (m3/s)	10.50	Culv Full Len (m)	23.85
# Barrels	1	Culv Vel US (m/s)	5.79
Q Barrel (m3/s)	10.50	Culv Vel DS (m/s)	5.79
E.G. US. (m)	72.53	Culv Inv El Up (m)	68.63
W.S. US. (m)	72.22	Culv Inv El Dn (m)	67.66
E.G. DS (m)	69.53	Culv Frctn Ls (m)	1.17
W.S. DS (m)	69.15	Culv Exit Loss (m)	1.35
Delta EG (m)	3.00	Culv Entr Loss (m)	1.02
Delta WS (m)	1.37	Q Weir (m3/s)	
E.G. IC (m)	74.13	Weir Sta Lft (m)	
E.G. OC (m)	72.53	Weir Sta Rgt (m)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (m)	70.75	Weir Max Depth (m)	
Culv WS Outlet (m)	69.13	Weir Avg Depth (m)	
Culv Nml Depth (m)	0.96	Weir Flow Area (m2)	
Culv Crt Depth (m)	1.52	Min El Weir Flow (m)	74.50

Warning: At least one culvert in the culvert group has supercritical flow at the outlet. However, since more than one culvert in the culvert group has flow, the program cannot determine if the downstream cross section should be subcritical or supercritical flow. The program used the downstream subcritical answer, even though it may not be valid.
Note: Culvert critical depth exceeds the height of the culvert.

CROSS SECTION

RIVER: 2
REACH: 1 RS: [illegible]

INPUT
Description: section8
Station Elevation Data num= [illegible]

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	79.19	[illegible]	[illegible]	[illegible]	79.12	1.07	79.09	[illegible]	[illegible]
1.44	79.06	2.11	[illegible]	[illegible]	78.94	3.92	79.02	[illegible]	[illegible]
11.4	79	16.34	[illegible]	26.98	[illegible]	26.1	[illegible]	29.71	[illegible]
35.18	75.24	[illegible]	[illegible]	38.82	74.7	44.16	74	44.48	[illegible]
47.1	73	48.49	72.57	49.71	72	52.36	71.08	51.87	[illegible]
52.14	70.93	53.1	70.79	53.2	69.9	56.21	69.42	58.13	[illegible]
61.05	69.96	62.03	[illegible]	62.13	70.43	62.22	70.47	62.27	[illegible]
62.42	70.6	62.56	70.64	62.8	71	67.3	71.74	68.42	[illegible]
69.14	72.26	71.13	72.44	73.84	73	74.22	73	74.32	[illegible]
77.09	73	77.58	[illegible]	78.06	73.2	78.68	73.4	87.49	[illegible]
86.34	73.38	87.49	[illegible]	88.26	73	88.35	73	88.42	[illegible]
89.69	73	89.72	[illegible]	89.75	73	89.75	73	89.94	[illegible]
89.85	73	91.05	[illegible]	91.26	73	91.64	73	99.67	[illegible]
102.16	73	109.17	[illegible]	112.11	72.47	112.84	72.36	113.13	[illegible]
113.42	72.19	114.72	[illegible]	116.65	71.59	119.44	71	121.13	[illegible]
121.7	70.44	122.74	[illegible]	123.77	70	124.18	69.87	124.24	[illegible]
124.41	69.64	125.1	[illegible]	125.43	69.35	125.64	69.23	126.12	[illegible]
127.11	67.83	128.13	[illegible]	129.27	67.84	130.26	69.34	130.59	[illegible]
130.8	69.77	130.94	[illegible]	131.08	70	131.45	70.11	132.17	[illegible]
132.86	70.4	133.45	[illegible]	133.91	70.61	135.86	70.89	135.7	[illegible]
136.04	71	136.32	[illegible]	139.57	71.75	141.15	72	144.12	[illegible]
145.58	72.57	146.09	[illegible]	146.41	72.7	148.69	73	153.43	[illegible]
155.12	72.63	156.46	[illegible]	160.86	72.69	162.62	73.87	163.1	[illegible]
164	73.93	164.21	[illegible]	164.44	73.97	164.48	73.97	165.2	[illegible]
167.42	74.31	168.25	[illegible]	171.75	74.82	172.37	[illegible]	173.42	[illegible]
173.11	75.13	173.64	[illegible]	174.81	75.3	175.3	75.4	175.38	[illegible]
175.12	75.41	175.75	[illegible]	175.92	75.61	176.61	[illegible]	181.1	[illegible]

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	119.44	.045	135.56	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
119.44	135.56	49.689	74.442	49.693	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	69.53	Element			
Vel Head (m)	0.37	Wt. n-Val.	0.055	0.045	
W.S. Elev (m)	69.15	Reach Len. (m)	99.69	74.44	49.69
Crit W.S. (m)	69.15	Flow Area (m2)	2.16	4.22	
E.G. Slope (m/m)	0.025311	Area (m2)	2.16	4.22	
Q Total (m3/s)	16.16	Flow (m3/s)	3.80	12.36	
Top Width (m)	8.38	Top Width (m)	4.02	4.36	
Vel Total (m/s)	2.53	Avg. Vel. (m/s)	1.76	2.93	
Max Chl Dpth (m)	1.39	Hydr. Depth (m)	0.54	0.97	
Conv. Total (m3/s)	101.6	Conv. (m3/s)	23.9	77.7	
Length Wtd. (m)	72.88	Wetted Per. (m)	4.55	5.59	
Min Ch El (m)	67.76	Shear (N/m2)	117.76	187.35	
Alpha	1.14	Stream Power (N/m s)	207.21	549.06	
Frctn Loss (m)	1.69	Cum Volume (1000 m3)	0.11	9.18	0.22
C & E Loss (m)	0.07	Cum SA (1000 m2)	0.20	16.49	0.66

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: Divided flow computed for this cross-section.
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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 17

INPUT
Description: section7
Station Elevation Data num= 149

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	75.59	4.15	75.59	5.02	75.02	6.12	75.01	6.3	75
6.59	75	6.79	75	11.16	74.22	11.50	74.16	11.76	74.13
11.89	74.11	12.05	74.09	12.98	74.03	13.02	74.03	13.36	74
13.81	74	15.18	74	15.16	74	16.25	73.76	16.37	73.72
16.91	73.61	17.53	73.52	18.51	73.26	18.7	73.23	18.92	73.21
20.5	73.11	20.77	73.06	21.63	73.02	21.65	73.02	21.81	73
22.1	72.88	24.44	72.62	24.93	72.56	25.27	72.52	25.77	72.5
26.07	72.53	28.32	72.31	29.02	72.24	30.16	72.27	30.78	72.23
31.41	72.24	32.13	72.20	32.44	72.17	32.54	72.15	33.45	72
37.18	71.57	39.05	71	39.11	70.99	39.12	70.99	39.14	70.99
39.16	70.98	43.49	70.42	43.93	70.22	44.5	70.19	45.23	70
45.45	69.96	46.46	69.78	47.15	69.65	47.68	69.55	50.4	69
50.6	69	51.36	69	56.45	68.15	56.6	68.15	58.39	68
58.57	68	58.9	68	59.41	68	60.41	68	61.3	68
61.81	67.92	63.26	67.97	63.28	67.97	63.31	67.96	63.9	67.98
63.95	67.97	64.59	67.93	64.66	67.92	65.66	67.79	66.63	67.69
70.65	67.1	71.68	67.11	72.36	67	72.51	67	73.8	66.81
75.32	66.53	76.78	66.28	78.17	66	78.37	66	79.93	66
80.85	66	82.47	66	82.55	66.01	82.57	66.02	83.55	66.23
84.14	66.33	85.03	66.43	85.53	66.49	86.93	66.67	87.97	66.83
88.83	66.91	89.68	66.98	89.71	66.98	89.74	66.98	89.78	66.98
90.85	67	91.57	67.02	91.68	67.02	95.75	67.23	95.85	67.23
97.18	67	97.89	67	100.77	66.63	101.3	66.57	103.01	66.36
104.05	66.14	105.21	66.29	105.94	66	106.09	66	106.47	66
108	66	108.31	66.07	112.33	67	114.45	67.52	116.47	68
119.09	68.62	120.68	69	122.36	69.39	122.78	69.48	123.46	69.64
124.59	69.9	124.99	70	125.21	70.05	125.94	70.23	129.11	71
131.1	71.45	133.45	72	134.92	72.09	136.28	72.19	138.94	72.37
146.86	73	154.20	73.54	159.88	74	166.21	74.53	167.4	74.62
169.26	74.77	172.35	75	177.65	75.48	179.21	75.62		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	70.95	.045	95.75	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
70.95	95.75	141.047	122.401	102.264	.1	.3

CROSS SECTION OUTPUT Profile #100Y

			Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]	Element			

Vel Head (m)	[illegible]	Wt. n-Val.			0.045	0.055
W.S. Elev (m)	[illegible]	Reach Len. (m)		141.39	122.60	122.26
Crit W.S. (m)	[illegible]	Flow Area (m2)			1.92	2.87
E.G. Slope (m/m)	0.057183	Area (m2)			1.92	2.87
Q Total (m3/s)	[illegible]	Flow (m3/s)			10.35	1.91
Top Width (m)	[illegible]	Top Width (m)			10.58	8.64
Vel Total (m/s)	2.42	Avg. Vel. (m/s)			2.68	2.06
Max Chl Dpth (m)	1.52	Hydr. Depth (m)			0.18	0.33
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)			42.8	14.7
Length Wtd. (m)	[illegible]	Wetted Per. (m)			10.68	8.77
Min Ch El (m)	[illegible]	Shear (N/m2)			200.55	103.25
Alpha	1.05	Stream Power (N/m s)			538.27	177.38
Frctn Loss (m)	1.06	Cum Volume (1000 m3)			9.89	3.15
C & E Loss (m)	0.52	Cum SA (1000 m2)			16.93	0.45

Warning: Divided flow computed for this cross-section.
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: 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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: [illegible]

INPUT
Description: section6
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	80.15	.79	[illegible]	4.93	79.11	5.11	79.06	5.10	79.14
5.17	79	5.97	78.17	9.95	78	13.97	77.1	14.4	[illegible]
14.88	76.89	18.72	[illegible]	22.56	75.61	20.93	75.02	21.56	75.13
22.79	75.1	23.14	[illegible]	24.68	74.68	25.55	74.43	25.99	74.34
29.35	74	29.99	73.7	34.65	73	41.11	72.02	41.25	[illegible]
44.36	71.64	45.42	71.44	46.79	71.36	47.83	71.21	49.39	71
50.41	70.74	52.4	70.27	53.77	70.53	54.17	70.22	52.1	[illegible]
52.3	69.32	54.17	69	55.63	68.36	58.95	68	57.82	67.54
58.95	67	60.31	66.61	61.24	66	63.32	65.08	63.51	65
64.63	64.52	65.0	64	67.34	63.35	68.09	63	73.12	63
73.44	63	73.16	63.32	74.01	63.11	77.21	63.72	78.62	63.01
78.2	64	78.49	64.19	80.21	64.34	82.27	64.75	83.27	[illegible]
85.19	65.36	89	65.21	91.19	66	91.58	66	91.81	[illegible]
93.01	66.11	93.31	66.13	97.44	66.36	98.71	66.39	99.54	66.41
104.96	67	105.21	67.74	105.32	67.29	105.65	67.32	108.14	[illegible]
113.11	68.45	118.3	69	122.45	69.36	123.56	69.46	126.34	69.72
129.36	70	136.31	70.74	137.47	70.92	138.22	71	145.11	71.1
146.5	72	154.13	73.49	154.17	73	154.18	73	154.42	73.11
154.32	73.02	161.80	73	165.13	74.41	169.84	75	173.24	75.42
173.18	75.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.32	[illegible]	85.19	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
63.32	85.19	[illegible]	109.475	99.215	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	[illegible]	Element	Left OB	Channel	Right OB
Vel Head (m)	[illegible]	Wt. n-Val.		[illegible]	
W.S. Elev (m)	[illegible]	Reach Len. (m)	[illegible]	[illegible]	[illegible]
Crit W.S. (m)	[illegible]	Flow Area (m2)		[illegible]	
E.G. Slope (m/m)	[illegible]	Area (m2)		[illegible]	
Q Total (m3/s)	[illegible]	Flow (m3/s)		[illegible]	
Top Width (m)	[illegible]	Top Width (m)		[illegible]	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		[illegible]	
Max Chl Dpth (m)	[illegible]	Hydr. Depth (m)		[illegible]	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		[illegible]	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		[illegible]	
Min Ch El (m)	[illegible]	Shear (N/m2)		[illegible]	
Alpha	[illegible]	Stream Power (N/m s)		[illegible]	
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)		[illegible]	[illegible]
C & E Loss (m)	[illegible]	Cum SA (1000 m2)		[illegible]	[illegible]

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 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: 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 ..

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description: section5
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	71.75	4.2	71	4.99	70.85	5.07	70.83	5.22	70.8
5.36	70.78	5.55	70.74	5.96	70.68	6.82	70.58	7.79	70.39
9.41	70.23	10.22	70	10.46	69.95	11.73	69.68	12.29	69.55
12.10	69.46	12.98	69.4	14.53	69	16.5	68.57	19.43	68
21.59	67.42	22.74	67.23	23.38	67	23.97	66.73	24.26	66.59
25.65	66	27.12	65.31	27.36	65.1	28.39	65	29.3	64.81
29.94	64.67	32.16	64.08	32.47	64.05	32.53	64.04	32.69	64
35.72	63.66	37.75	63	37.79	62.98	41.55	62	42.45	61.8
45.32	61	49.94	61	50.73	61	51.33	61	53.93	61
54.17	61	54.41	61	54.69	61	54.92	61	55.78	61
56.2	61	56.61	61	56.82	61.03	57.1	61.06	58.99	61.22
59.5	61.31	60.18	61.43	60.59	61.53	62.94	61.82	63.05	61.85
63.47	61.94	63.52	61.94	64.26	62	65.24	62.13	65.94	62.21
66.59	62.25	67.82	62.34	70.06	62.44	70.54	62.45	70.73	62.5
72.42	62.52	75.27	63	75.94	63.26	76.61	63.5	77.44	63.82
78.17	64	79.16	64.4	80.65	64.53	81.1	64.81	81.79	65
82.5	65.19	83.05	65.32	83.3	65.55	84.31	65.66	84.54	65.73
85.33	66	87.13	66.42	89.29	67	91.53	67.57	93.04	68
97.21	68.05	98.95	68.66	101.42	68.93	101.57	68.95	101.65	68.96
102.23	69	103.23	69.06	104.23	69.11	104.36	69.12	104.49	69.12
105.41	69.18	105.68	69.19	105.97	69.21	106.22	69.23	106.59	69.26
106.72	69.27	113.26	69.68	113.78	69.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	41.55	.045	63.47	.055

Bank Sta: Left 41.55 Right 63.47 Lengths: Left 15.240 Channel 33.888 Right 35.815 Coeff Contr. .1 Expan. .3

CROSS SECTION OUTPUT Profile #100?

E.G. Elev (m)	62.00	Element	Left OB	Channel	Right OB
Vel Head (m)	0.05	Wt. n-Val.		0.045	0.000
W.S. Elev (m)	61.94	Reach Len. (m)	0.50	0.50	0.50
Crit W.S. (m)	61.58	Flow Area (m2)		15.64	0.00
E.G. Slope (m/m)	0.003274	Area (m2)		15.64	0.00
Q Total (m3/s)	16.16	Flow (m3/s)		16.16	0.00
Top Width (m)	21.78	Top Width (m)		21.67	0.11
Vel Total (m/s)	1.03	Avg. Vel. (m/s)		1.03	0.02
Max Chl Depth (m)	0.94	Hydr. Depth (m)		0.72	0.00
Conv. Total (m3/s)	278.2	Conv. (m3/s)		278.2	0.0
Length Wtd. (m)	0.50	Wetted Per. (m)		21.85	0.11
Min Ch El (m)	61.00	Shear (N/m2)		23.69	
Alpha	1.00	Stream Power (N/m s)		24.47	
Frctn Loss (m)	0.00	Cum Volume (1000 m3)		7.02	0.00
C & E Loss (m)	0.02	Cum SA (1000 m2)		12.81	0.00

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

BRIDGE

RIVER: 1
REACH: 1 RS: [illegible]

INPUT
Description:
Distance from Upstream XS = .5
Deck/Roadway Width = [illegible]
Weir Coefficient = 3.44
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Chord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	63.29	61	47.51	63.29	61	47.61	63.29	62.29
57.51	63.29	62.29	57.51	63.29	61	113.78	63.29	61

Upstream Bridge Cross Section Data
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	71.75	4.2	71	4.99	70.85	5.07	70.83	5.22	70.8
5.36	70.78	5.55	70.74	5.96	70.68	6.82	70.58	7.79	70.39

5.41	70.29	10.22	70	10.44	69.95	11.75	69.68	12.29	69.55
12.79	69.46	13.98	69.4	14.59	69	16.5	68.57	19.41	68
22.08	67.42	22.74	67.25	23.38	67	23.97	66.73	24.26	66.59
25.85	66	27.12	65.71	27.96	65.1	28.39	65	29.1	64.81
29.94	64.67	32.76	64.06	32.47	64.05	33.53	64.04	32.69	64
35.02	63.56	37.75	63	37.79	62.99	41.55	62	42.45	61.8
45.82	61	49.94	61	50.73	61	51.37	61	53.93	61
54.17	61	54.41	61	54.69	61	54.92	61	55.79	61
56.1	61	56.61	61	58.92	61.03	57.1	61.06	58.99	61.22
59.5	61.31	60.18	61.43	60.59	61.55	62.94	61.82	63.05	61.85
63.47	61.94	63.52	61.94	64.26	62	65.24	62.13	65.94	62.21
66.54	62.25	67.41	62.34	70.56	62.44	70.54	62.45	70.73	62.5
72.42	62.52	75.27	63	75.34	63.26	76.61	63.5	77.44	63.32
78.29	64	79.58	64.4	80.05	64.53	81.1	64.81	81.79	65
82.5	65.19	83.05	65.2	83.9	65.25	84.31	65.66	84.58	65.73
85.53	66	87.12	66.42	89.23	67	91.53	67.57	93.04	68
93.31	68.05	98.95	68.66	101.42	68.93	101.57	68.95	101.65	68.96
102.16	69	103.23	69.06	104.23	69.11	104.36	69.12	104.48	69.12
105.41	69.18	105.68	69.19	105.87	69.21	106.12	69.23	106.53	69.26
104.77	69.27	113.26	69.69	113.79	69.71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	41.55	.045	63.47	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
41.55	63.47	.1	.3

Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	63.29	60	70.865	63.29	60	70.865	63.29	61.29
80.865	63.29	62.29	80.865	63.29	60	109.3	63.29	60

Downstream Bridge Cross Section Data

Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.69	4.14	73.19	5.67	73	5.99	72.96	8.68	72.85
12.6	72	16.1	71.47	20.22	71	25.11	70.34	26.39	70.22
28.04	70	28.42	70	28.75	70	28.39	70	29.29	69.81
32	69.52	33.04	69.37	35.41	69	36.69	68.81	41.71	68
44.59	67.48	46.26	67.34	46.41	67.11	46.49	67.08	48.73	67
48.89	66.94	48.91	66.92	49.14	66.85	49.45	66.88	49.42	66
51.21	65.25	52.24	65	53.52	64.9	53.69	64.85	53.93	64.48
54.85	64.29	54.93	64.21	55.1	64.14	55.2	64.13	55.28	64.1
55.67	64	56.35	63.82	59.7	63	62.78	62.26	63.6	62.1
63.77	62.06	64.19	62	67.61	61.5	68.29	61.4	68.71	61.33
70.53	61	74.05	60.54	74.47	60.45	75.01	60.36	75.09	60.33
76.61	60	77.01	60	77.59	60	78.22	60	79.13	60
79.85	60	79.88	60	80.49	60.12	80.87	60.18	83.7	60.75
84.47	60.89	84.72	60.92	84.73	60.85	84.78	60.96	84.85	61
86.85	61.59	88.13	62	88.29	62.05	89.61	62.47	91.21	62.97
91.25	63	91.42	63.02	91.36	63.01	91.5	63.07	94.92	64
96.14	64.61	97.41	65	97.84	65.08	100.82	65.39	101.17	65.41
101.75	65.44	102.13	65.46	102.71	65.48	103.92	65.56	104.17	65.57
104.67	65.61	105.28	65.64	105.79	65.67	105.99	65.68	108.9	65.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	63.6	.045	88.13	.055

Bank Sta: Left	Right	Coeff Contr.	Expan.
63.6	88.13	.1	.3

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
Downstream Embankment side slope = 2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 65
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Method: - Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations are critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE INPUT Profile #1??

			Element	Inside BR US	Inside BR DS
E.G. US. (m)	[illegible]		E.G. Elev (m)	61.97	61.29
W.S. US. (m)	[illegible]		W.S. Elev (m)	61.69	60.97
Q Total (m3/s)	[illegible]		Crit W.S. (m)	61.65	60.97
Q Bridge (m3/s)	[illegible]		Max Chl Dpth (m)	0.69	0.97
Q Weir (m3/s)			Vel Total (m/s)	2.35	2.51
Weir Sta Lft (m)			Flow Area (m2)	6.87	6.43
Weir Sta Rgt (m)			Froude # Chl	0.91	1.00
Weir Submerg			Specif Force (m3)	6.23	6.73
Weir Max Depth (m)			Hydr Depth (m)	0.69	0.64
Min El Weir Flow (m)	[illegible]		W.P. Total (m)	10.01	10.09
Min El Prs (m)	[illegible]		Conv. Total (m3/s)	118.7	105.9
Delta EG (m)	[illegible]		Top Width (m)	10.00	10.00
Delta WS (m)	[illegible]		Frctn Loss (m)	0.68	0.01
BR Open Area (m2)	[illegible]		C & E Loss (m)	0.00	0.02
BR Open Vel (m/s)	[illegible]		Shear Total (N/m2)	124.73	145.57
Coef of Q			Power Total (N/m s)	293.58	365.64
Br Sel Method	Energy only				

Note: Momentum answer is not valid if the water surface is above the low chord or if there is weir flow. The momentum answer has been disregarded.

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: 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.

CROSS SECTION

RIVER: [illegible]
REACH: 1 RS: [illegible]

INPUT
Description: section4
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
[illegible]	73.63	[illegible]	[illegible]	5.67	73	5.89	72.96	6.66	72.85
12.4	72	[illegible]	[illegible]	20.02	71	25.11	70.34	26.39	70.21
28.06	70	[illegible]	[illegible]	28.35	70	28.38	70	29.59	69.84
[illegible]	68.52	[illegible]	[illegible]	35.41	69	36.65	68.81	41.71	68
44.59	67.48	[illegible]	[illegible]	46.41	67.11	46.49	67.08	46.73	67
48.89	66.94	[illegible]	[illegible]	47.14	66.85	47.45	66.68	49.41	66
51.51	65.11	[illegible]	[illegible]	52.52	64.9	52.69	64.85	53.83	64.48
54.65	64.28	[illegible]	[illegible]	55.1	64.18	55.2	64.13	55.28	64.1
55.67	64	[illegible]	[illegible]	59.7	63	62.38	62.26	63.6	62.1
63.77	62.66	[illegible]	[illegible]	67.63	61.5	68.28	61.4	68.71	61.33
70.53	61	[illegible]	[illegible]	74.47	60.46	75.01	60.36	75.89	60.19
76.91	60	[illegible]	[illegible]	77.08	60	78.22	60	79.13	60
79.35	60	[illegible]	[illegible]	80.49	60.12	80.97	60.18	83.7	60.75
84.47	60.99	[illegible]	[illegible]	84.73	60.95	84.78	60.88	84.95	61
86.85	61.59	[illegible]	[illegible]	88.29	62.05	89.61	62.47	91.21	62.99
91.25	63	[illegible]	[illegible]	91.36	63.03	91.5	63.07	94.32	64
[illegible]	64.61	[illegible]	[illegible]	97.84	65.06	100.82	65.39	101.17	65.41
101.79	65.44	[illegible]	[illegible]	102.73	65.48	103.92	65.56	104.37	65.58
104.87	65.61	[illegible]	[illegible]	105.74	65.67	105.99	65.69	108.9	65.91

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
[illegible]	.055	[illegible]	.045	88.13	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
[illegible]	88.13	157.007	146.130	141.32	.1	.3

CROSS SECTION OUTPUT Profile #100T

			Element	Left OB	Channel	Right OB
E.G. Elev (m)	[illegible]		Wt. n-Val.		0.045	
Vel Head (m)	[illegible]		Reach Len. (m)	157.01	146.13	141.32
W.S. Elev (m)	[illegible]		Flow Area (m2)		5.09	
Crit W.S. (m)	[illegible]		Area (m2)		5.09	
E.G. Slope (m/m)	[illegible]		Flow (m3/s)		16.16	
Q Total (m3/s)	[illegible]		Top Width (m)		11.15	
Top Width (m)	[illegible]		Avg. Vel. (m/s)		3.17	
Vel Total (m/s)	[illegible]		Hydr. Depth (m)		0.46	
Max Chl Dpth (m)	[illegible]		Conv. (m3/s)		66.6	
Conv. Total (m3/s)	[illegible]		Wetted Per. (m)		11.28	
Length Wtd. (m)	[illegible]		Shear (N/m2)		260.59	
Min Ch El (m)	[illegible]		Stream Power (N/m s)		826.85	
Alpha	[illegible]		Cum Volume (1000 m3)		6.79	
Frctn Loss (m)	[illegible]		Cum EA (1000 m2)		12.47	
C & E Loss (m)	[illegible]					

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: The energy method has computed a Class B profile.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 13

INPUT
Description: section3
Station Elevation Data num= 119

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	67.71	.48	67.68	5.77	67	5.81	67	8.85	66.5
11.83	66	14.34	65.73	14.86	65.67	15.76	65.57	17.61	65.38
19.15	65.2	20.76	65	23.89	64.23	24.51	64.1	24.95	64
29.1	63.96	29.93	63	31.5	62.36	32.41	62.14	32.58	62.1
33.04	62	34.87	61.4	37.08	61.18	37.64	61.08	38	61
38.26	60.76	39.41	60.65	41.67	60	43.51	59.5	45.51	59
46.51	58.7	48.71	58	48.92	57.91	49.05	57.87	49.95	57.63
50.46	57.52	51.39	57	52.26	57	52.31	57	55.3	57
61.29	57	63.44	57	63.79	57	65.04	57	67.21	57
68.54	57	68.94	57	70.89	57	72.13	57	73.85	57
74.46	57	75.1	57	75.79	57	76.44	57	76.58	57
77.14	57	77.26	57	77.59	57	80.05	57	80.14	57
82.55	57	83.46	57	83.49	57	84.38	57	84.44	57
85.54	57.06	85.61	57.04	86.75	57.43	92.8	57.72	93.01	57.72
93.79	57.8	93.84	57.82	95.17	57.87	95.48	57.89	95.71	57.94
98.12	57.97	98.74	58	99.52	58	101.17	58.13	101.27	58.15
101.43	58.19	102.09	58.18	102.66	59	104.38	59.18	104.52	59.23
105.59	59.43	106.41	60	106.77	60.14	108.23	60.71	108.71	60.9
108.94	61	110.36	61.55	111.26	61.94	111.4	62	111.62	62.05
113.81	63	115.78	63.7	116.83	64	119.11	64.64	120.56	65
120.67	65	120.84	65	121.26	65	121.58	65	121.98	65
122.19	65	122.55	65	123.54	65.65	134.38	65.7	135.17	65.73
135.61	65.75	139.12	66	146.34	66.47	154.06	67	162.52	67.46
163.11	67.91	163.72	67.94	164.4	68	164.77	68.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	45.51	.045	102.66	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
45.51	102.66	162.002	156.007	152.860	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	67.[illegible]	Element	Left OB	Channel	Right OB
Vel Head (m)	[illegible]	Wt. n-Val.		[illegible]	
W.S. Elev (m)	67.[illegible]	Reach Len. (m)	162.00	[illegible]	152.8[illegible]
Crit W.S. (m)	67.[illegible]	Flow Area (m2)		[illegible]	
E.G. Slope (m/m)	[illegible]	Area (m2)		[illegible]	
Q Total (m3/s)	[illegible]	Flow (m3/s)		[illegible]	
Top Width (m)	40.[illegible]	Top Width (m)		[illegible]	
Vel Total (m/s)	[illegible]	Avg. Vel. (m/s)		0.[illegible]	
Max Chl Dpth (m)	[illegible]	Hydr. Depth (m)		[illegible]	
Conv. Total (m3/s)	[illegible]	Conv. (m3/s)		[illegible]	
Length Wtd. (m)	[illegible]	Wetted Per. (m)		[illegible]	
Min Ch El (m)	[illegible]	Shear (N/m2)		[illegible]	
Alpha	[illegible]	Stream Power (N/m s)		[illegible]	
Frctn Loss (m)	[illegible]	Cum Volume (1000 m3)		[illegible]	
C & E Loss (m)	[illegible]	Cum WA (1000 m2)		[illegible]	

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

CROSS SECTION

RIVER: 2
REACH: 1 RS: [illegible]

INPUT
Description: section2
Station Elevation Data num= 139

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.23	2.14	[illegible]	2.14	69.26	2.68	69.25	3.24	69.23
13	69.22	13.14	69.[illegible]	13.7	69.33	14.11	69.38	14.53	69.32
14.49	69.22	15.7[illegible]	[illegible]	16.3	69.32	16.65	69.32	17.03	69.32
18.18	69.37	18.8[illegible]	[illegible]	[illegible]	69.39	21.98	69.33	26.71	69.34
26.90	69.5	27.21	[illegible]	28.27	69.55	28.92	69.57	29.34	69.59
32.54	69.61	34.1	[illegible]	35.23	69.66	35.86	69.67	36.61	69.7
36.87	69.73	38.23	[illegible]	38.53	69.77	37.23	69.7	37.76	69.82
38.76	69.94	39.7[illegible]	[illegible]	[illegible]	69.89	41.7[illegible]	69.91	41.23	69.93

43.84	69.96	44.9	68.39	45.58	70	46.17	69.98	47.27	69.94
47.4	69.83	49.04	68.97	50.05	69.83	51.07	69.78	52.22	69.73
52.81	69.68	53.39	69.61	57.32	69.34	57.95	69.3	59.63	69.14
59.83	69.12	61.06	69	64.92	69	68.39	69	69.39	69.46
71.93	69.47	72.84	69	73.68	68.69	75.02	68	77.61	67.01
77.82	67	77.82	66.95	81.19	66	81.86	65.8	87.27	64.27
88.15	64	89.89	63.49	90.47	63.34	91.15	63.17	91.84	63
95.12	62	95.11	62	95.14	62	97.59	61	98.27	60.71
101.89	59.26	102.1	59	102.76	58.8	104.61	58	106.6	57.15
106.95	57	109.14	56.04	109.22	56	113.16	54.29	113.76	54.03
114.84	54	113.99	54	117.48	54	125.01	54.89	125.68	54.96
125.89	55	131.71	55.66	132.64	56	132.66	56	132.76	56.02
138.82	57	141.12	57.41	144.2	57.39	144.62	57.37	144.82	57.38
147.36	58	149.5	58.27	153.26	59	156.65	59.51	157.27	59.61
158.12	59.76	158.41	59.8	159.44	60	160.55	60.11	162.94	60.35
164.46	60.51	165.24	60.6	169.01	61	178.87	61.96	179.26	62
179.75	62.06	179.88	62.07	180.1	62.08	183.45	62.4	185.02	62.54
192.38	63	193.25	63.04	193.39	63.05	193.48	63.06	193.55	63.06
201.1	63.48	202.06	63.52	202.38	63.52	202.72	63.54	209.43	63.55
211.35	63.4	212.34	63.39	213.16	63.33				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	106.6	.045	138.82	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
106.6	138.82	167.767	168.659	174.248	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	55.57	Element	Left OB	Channel	Right OB
Vel Head (m)	0.32	Wt. n-Val.		0.045	
W.S. Elev (m)	55.25	Reach Len. (m)	167.77	168.66	174.25
Crit W.S. (m)	55.19	Flow Area (m2)		12.96	
E.G. Slope (m/m)	0.010195	Area (m2)		12.96	
Q Total (m3/s)	32.34	Flow (m3/s)		32.34	
Top Width (m)	16.72	Top Width (m)		16.72	
Vel Total (m/s)	2.50	Avg. Vel. (m/s)		2.50	
Max Chl Dpth (m)	1.25	Hydr. Depth (m)		0.78	
Conv. Total (m3/s)	239.8	Conv. (m3/s)		239.8	
Length Wtd. (m)	168.66	Wetted Per. (m)		17.05	
Min Ch El (m)	54.00	Shear (N/m2)		135.58	
Alpha	1.00	Stream Power (N/m s)		338.40	
Frctn Loss (m)	1.95	Cum Volume (1000 m3)		2.93	
C & E Loss (m)	0.10	Cum SA (1000 m2)		4.26	

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: 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.

CROSS SECTION

RIVER: 2
REACH: 1 RS: 21

INPUT
Description: section1
Station Elevation Data num= 150

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	59.33	5.6	59.66	7.23	59.76	9.44	59.9	11.03	60
12.48	60.15	14.25	60.4	15.25	60.45	20.42	61	23.17	61.36
27.31	62	33.86	62.4	34.22	63	38.33	63.27	38.75	63.29
46.36	63	51.06	63	51.14	62.99	52.77	62.79	53.39	62.71
57.21	62.21	58.8	62	62.7	61.5	66.68	61	69.96	60.69
70.68	60.63	71.8	60.55	72.86	60.45	75	60.27	77.53	60.06
78.27	60	78.43	59.94	89.37	59	92.64	58.73	93.61	58.65
97.1	58.27	99.06	58.07	99.77	58	100.38	57.85	109.24	57
110.37	56.73	113.37	56	114.06	55.69	115.19	55.57	116.81	55.18
117.52	55	119.82	54.89	120.32	54.31	120.57	54.29	122.03	54.11
122.13	54.12	123.62	54.07	123.71	54.08	123.78	54.08	123.86	54.09
123.93	54.09	124.35	54	131.18	53.6	131.8	53.54	132.3	53.51
136.12	53	136.1	53	136.32	53	136.34	53	136.38	53
139.05	53	140.06	53	149.48	52.36	150.02	52.35	150.33	52.34
150.91	52.33	154.19	52.42	154.43	52.43	156.21	52.52	160.99	53
161.39	53	161.71	53	162.22	53	162.61	53	163.76	53
164.27	53.07	164.39	53.09	164.64	53.13	167.66	53.59	169.62	54
169.67	54	169.71	54	170.73	54.36	172.49	55	173.16	55.18
174.69	55.54	175.17	55.68	175.84	55.78	176.08	55.83	176.23	55.86
176.35	55.87	176.47	55.88	176.55	55.89	177.79	56	180.19	56
180.5	56	180.75	56	181.05	56	181.45	56.23	184.22	56.35
189.08	56.94	189.69	57	189.84	57	189.51	57	204.68	57.4
205.8	57.47	207.92	57.56	212.58	57.8	212.98	57.81	215.44	58
226.18	58	230.64	58	234.28	58	235.62	58	237.13	58
239.2	58	239.24	58	240.18	58	246.5	58	246.91	58

248.1	57.64	248.91	57.60	249.56	57.43	250.69	57.22	251.5	57.01
251.95	57	252.25	57	253.28	57	253.49	57	254.76	57
256.40	57	257.31	57	259.09	57	261.51	56.74	265.61	56.29
265.79	56.24	266.29	56.16	267.31	56.02	267.42	56	268.11	55.88
268.78	55.8	268.94	55.79	269.5	55.77	269.64	55.77	269.77	55.77

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.055	131.18	.045	187.66	.055

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
131.18	187.66	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #100Y

E.G. Elev (m)	53.55	Element	Left OB	Channel	Right OB
Vel Head (m)	.15	Wt. n-Val.		0.045	
W.S. Elev (m)	53.44	Reach Len. (m)			
Crit W.S. (m)	53.22	Flow Area (m2)		21.83	
E.G. Slope (m/m)	0.009011	Area (m2)		21.83	
Q Total (m3/s)	32.34	Flow (m3/s)		32.34	
Top Width (m)	33.00	Top Width (m)		33.00	
Vel Total (m/s)	1.48	Avg. Vel. (m/s)		1.48	
Max Chl Dpth (m)	1.11	Hydr. Depth (m)		0.66	
Conv. Total (m3/s)	361.3	Conv. (m3/s)		361.3	
Length Wtd. (m)		Wetted Per. (m)		33.97	
Min Ch El (m)	52.33	Shear (N/m2)		50.49	
Alpha	1.05	Stream Power (N/m s)		74.75	
Frctn Loss (m)		Cum Volume (1000 m3)			
C & E Loss (m)		Cum SA (1000 m2)			

SUMMARY OF MANNING'S N VALUES

River:2

Reach	River Sta.	n1	n2	n3
1	30	.055	.045	.055
1	29	.055	.045	.055
1	28.5	Culvert		
1	28	.055	.045	.055
1	27	.055	.045	.055
1	26	.055	.045	.055
1	25	.055	.045	.055
1	24.5	Bridge		
1	24	.055	.045	.055
1	23	.055	.045	.055
1	22	.055	.045	.055
1	21	.055	.045	.055

SUMMARY OF REACH LENGTHS

River: 2

Reach	River Sta.	Left	Channel	Right
1	30	92.125	55.547	26.773
1	29	22.665	30.343	49.822
1	28.5	Culvert		
1	28	39.489	74.442	45.693
1	27	147.047	121.901	102.594
1	26	124.435	109.475	99.215
1	25	32.142	23.838	15.535
1	24.5	Bridge		
1	24	157.003	146.128	141.32
1	23	162.042	156.027	152.866
1	22	187.767	168.455	174.268
1	21	0	0	0

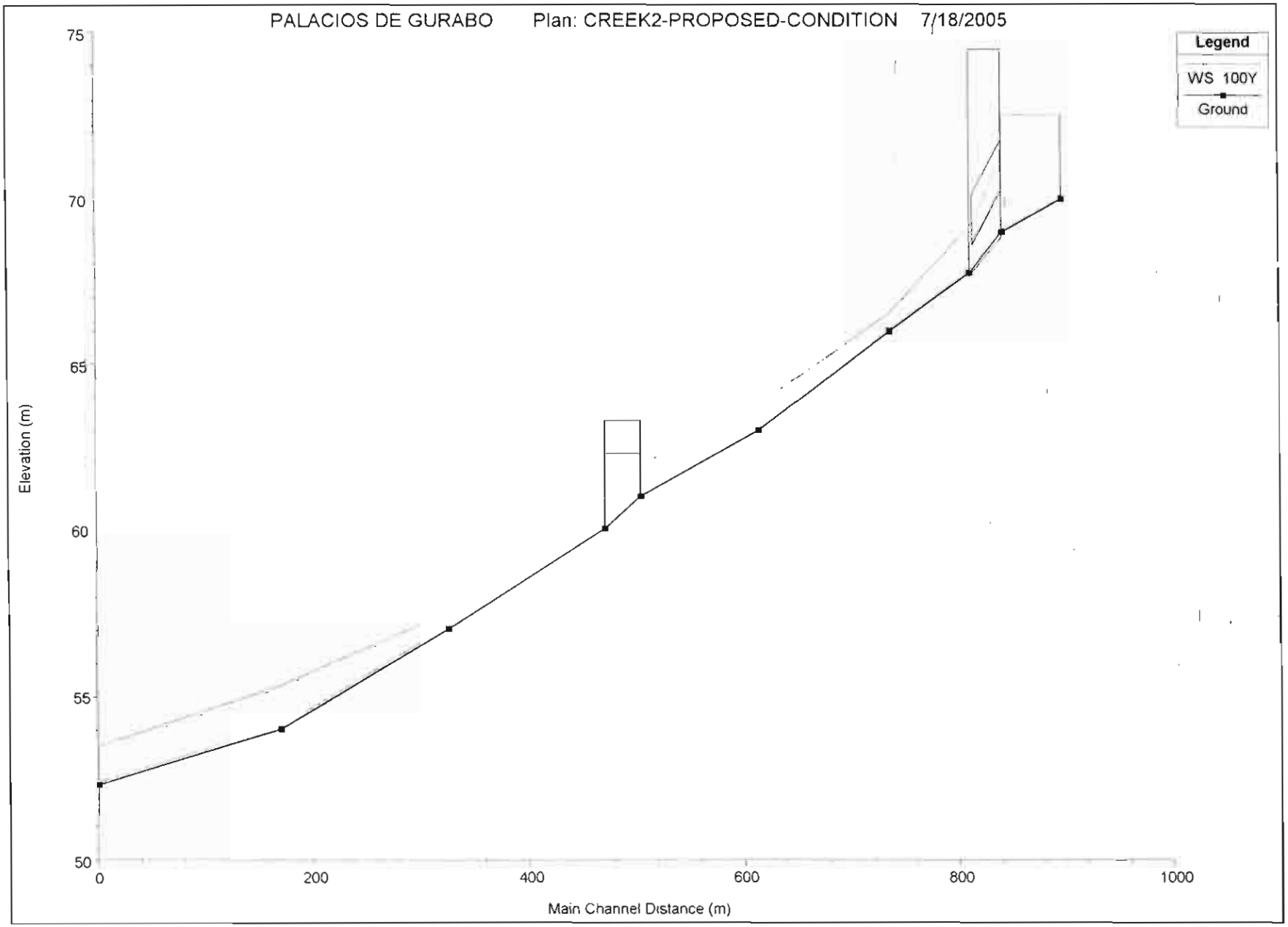
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2

Reach	River Sta.	Contr.	Expan.
1	30	.1	.3
1	29	.1	.3
1	28.5	Culvert	
1	28	.1	.3
1	27	.1	.3

1	30		.1	.3
1	29		.1	.3
1	28.5	Bridge		
1	28		.1	.3
1	27		.1	.3
1	26		.1	.3
1	25		.1	.3

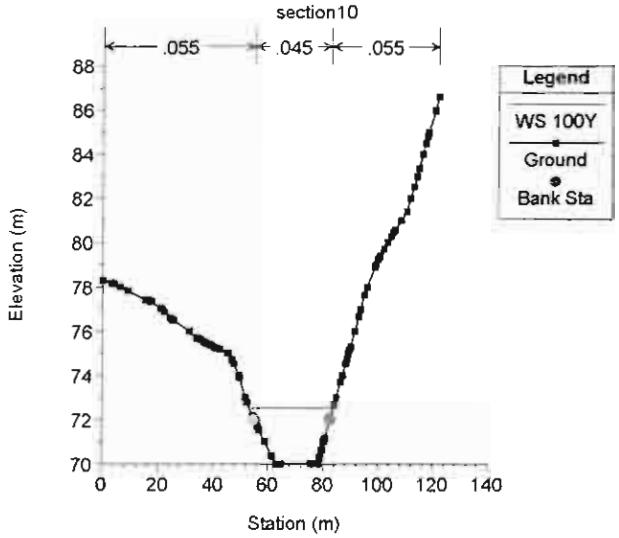
Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	30	100Y	10.49	70.00	72.53	70.35	72.53	0.000026	0.18	58.27	30.44	0.04
1	29	100Y	16.16	69.00	72.52	70.09	72.53	0.000034	0.25	95.51	76.10	0.05
1	28.5		Culvert									
1	28	100Y	16.16	67.76	69.15	69.15	69.53	0.025315	2.93	6.38	8.38	0.95
1	27	100Y	16.16	66.00	66.53	66.62	66.85	0.057188	2.68	6.69	19.26	1.42
1	26	100Y	16.16	63.00	63.81	63.81	64.11	0.024684	2.43	6.65	11.21	1.01
1	25	100Y	16.16	61.00	61.54	61.54	62.00	0.003374	1.03	15.64	21.76	0.39
1	24.5		Bridge									
1	24	100Y	16.16	60.00	60.74	60.90	61.25	0.058847	3.17	5.09	11.15	1.50
1	23	100Y	16.16	57.00	57.45	57.28	57.50	0.006543	0.99	16.40	40.27	0.49
1	22	100Y	32.34	54.00	55.25	55.19	55.57	0.018195	2.50	12.96	16.72	0.90
1	21	100Y	32.34	52.33	53.44	53.22	53.55	0.008011	1.48	21.83	33.86	0.59


PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005
Legend
WS 100Y
Ground
Elevation (m)
75
70
65
60
55
50
0
200
400
600
800
1000
Main Channel Distance (m)

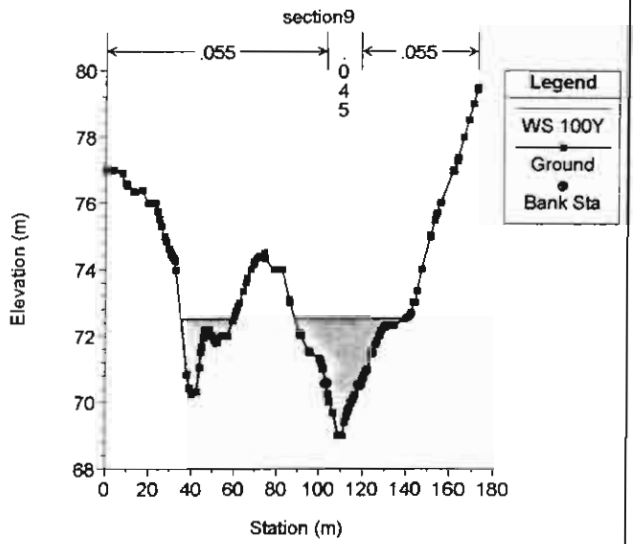
PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section10



PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section9



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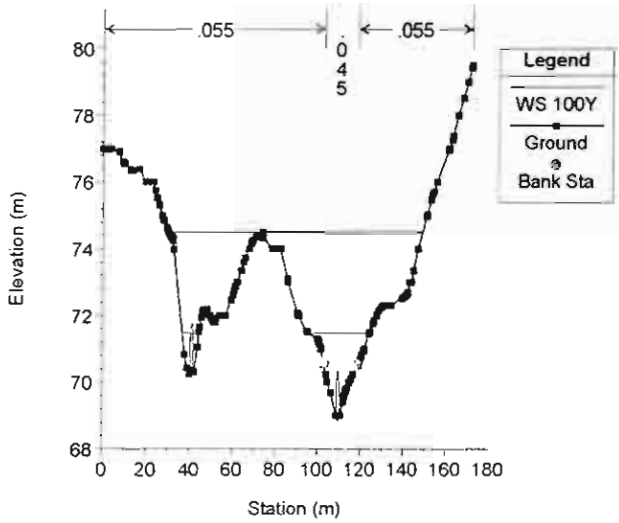

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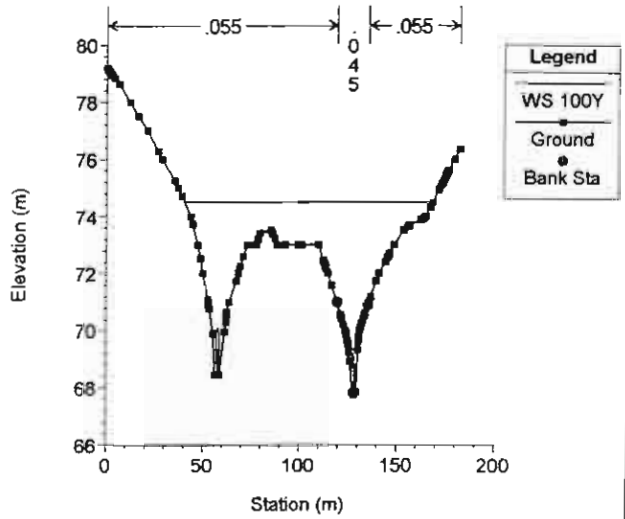
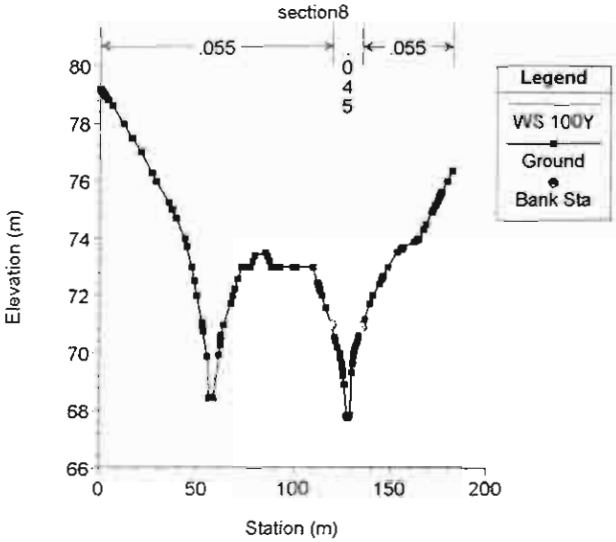


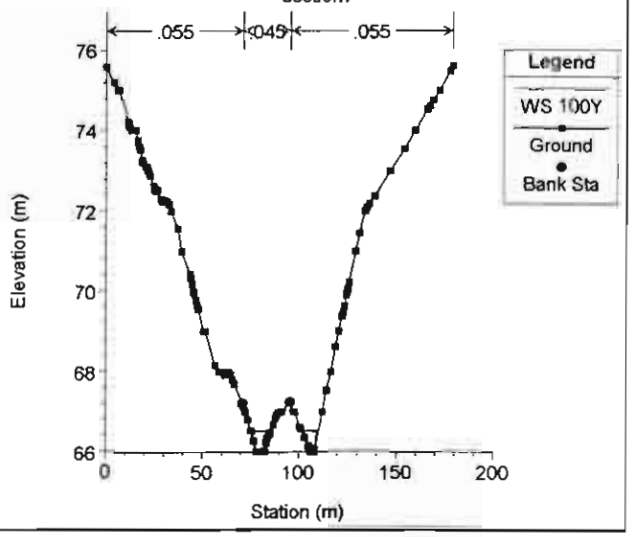
PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section8



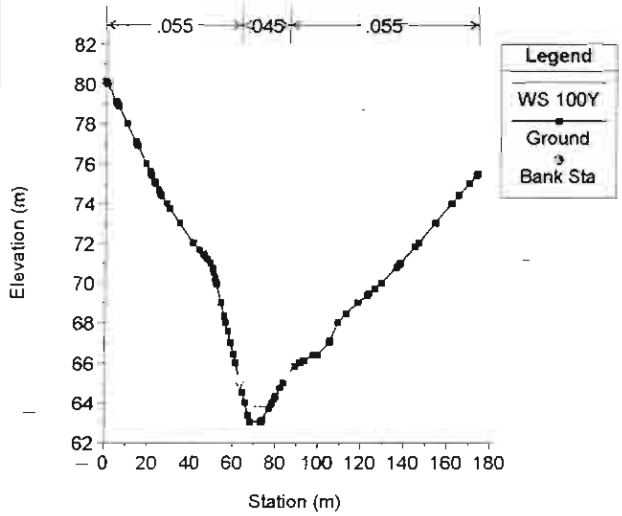
PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section7



PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section6



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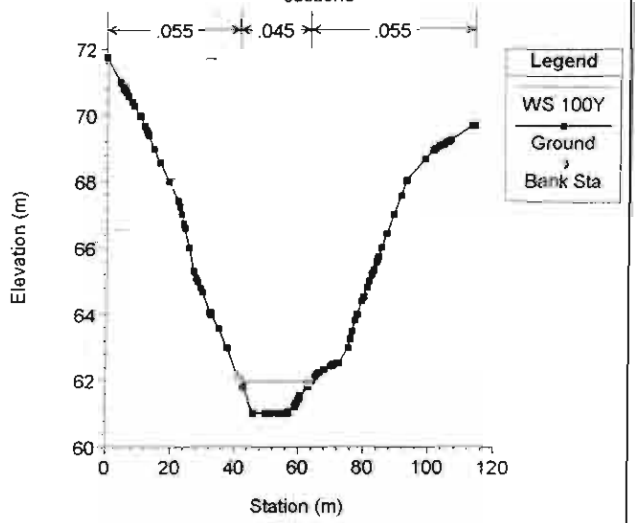
section5



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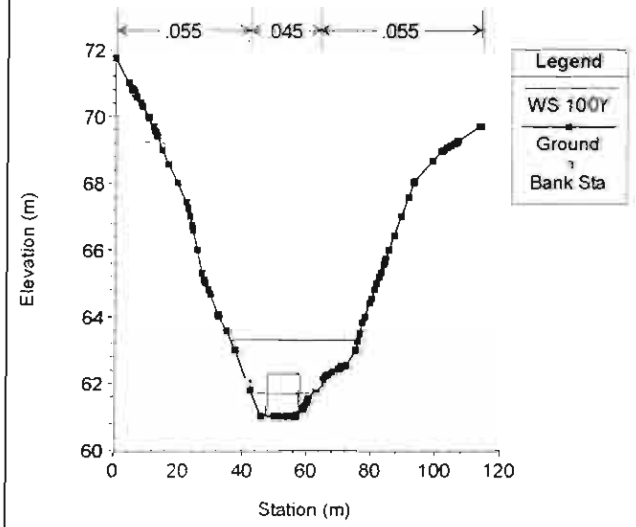

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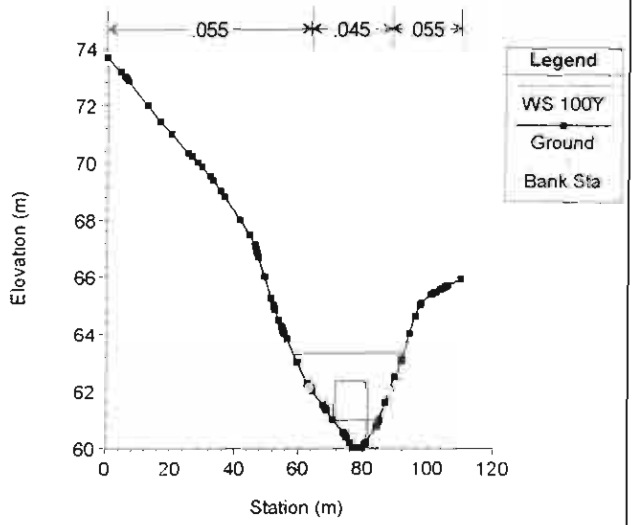
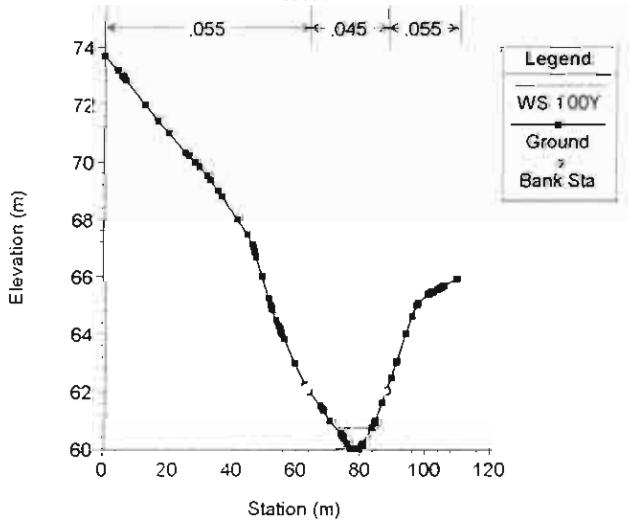


PALACIOS DE GURABO Plan: CREEK2-PROPOSED-CONDITION 7/18/2005

section4



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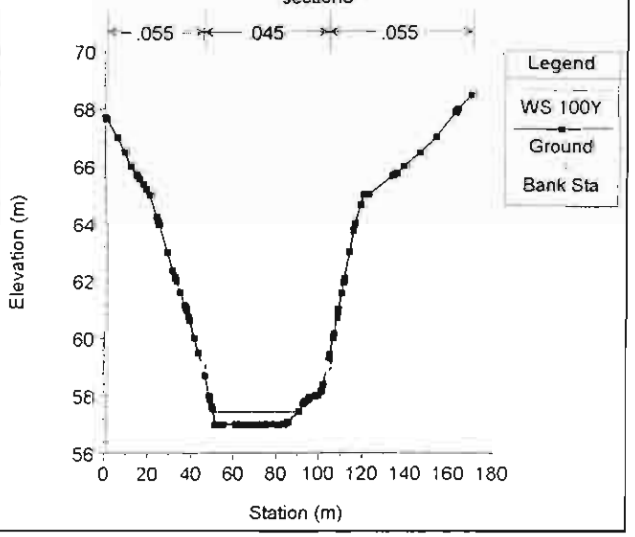
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