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Maricopa County

GILA BEND CANAL FLOODPLAIN DELINEATION STUDY

Gillespie Dam to Gila Bend

FCD 90-06

HYDRAULIC ANALYSIS AND FLOODPLAIN DELINEATIONN REPORT

NOVEMBER, 1991

Donohue ENGINEERS ARCHITECTS SCIENTISTS

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Gillespie Dam to Gila Bend

PREPARED FOR

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

November, 1991

Donohue & Associates, Inc.
Phoenix, Arizona
Donohue Project No. 18099

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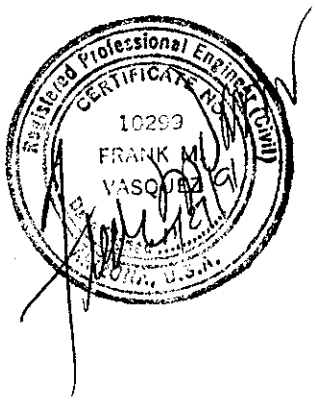

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LIST OF ATTACHMENTS
(submitted separately)

1 Basin Map Showing Structure and Ponding Storage Locations

2 Canal Berm and Channel Profile Showing the Location of Basin Divides and Hydraulic Structures (2 Sheets)

3 Floodplain Delineation Maps (14 Sheets)

4 Floodplain Delineation Maps Showing the Previous Floodplain Delineated by Approximate Methods (14 Sheets)

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises existing flood hazard information and provides floodplain elevations in areas adjacent to the east berm of the Gila Bend Canal between Gillespie Dam and the Gila Bend town limits. The study area lies entirely in an unincorporated area of Maricopa County, Arizona. This study consists of the topographic mapping, hydrologic analysis, and hydraulic analysis necessary to determine 100-year flood elevations and to map regulatory floodplain boundaries for the area. Floodplain mapping will allow regulation of future development in the area.

1.2 Authority for the Study

The Flood Control District of Maricopa County (FCDMC) is obligated under Federal Law and Arizona Revised Statutes to perform floodplain management and oversight of floodplain uses, such as land development, gravel mining, and others, in order to maintain requirements for flood insurance provided by the Federal Emergency Management Agency (FEMA) in Maricopa County and other entities falling within its jurisdiction. It is by this authority that projects such as the Gila Bend Canal Floodplain Delineation Study are conducted to define floodplains and to insure that activities within flood hazard areas are regulated in accordance with FEMA requirements.

The overall authority for this study is in the provisions of the National Flood Insurance Act of 1968 (PL 90-448) and the Flood Disaster Protection Act of 1983 (PL 93-234). This study was funded by the Flood Control District of Maricopa County.

1.3 Coordination

The FCDMC specified the limits of this delineation study and assisted in the selection of the detailed hydrologic and hydraulic methods used to determine

flood flows and elevations. The FCDMC was responsible for the previous flood insurance study of the area and provided available information on previous studies. The previous delineation was by approximate methods and the basis of that delineation is not known.

This study was also coordinated with the Arizona Department of Water Resources (ADWR), the Woolsey Peak Flood Protection District, and the La Paloma Ranch which owns the Gila Bend Canal. Public notice of the study was published at the commencement of the study to invite relevant public comments. The Buckeye Office of the Soil Conservation Service provided soils maps and descriptions for use in the hydrologic analysis.

2.0 AREA STUDIED

2.1 Scope of the Study

The study consisted of the following tasks:

1. Topographic mapping
2. Hydrologic analysis
3. Hydraulic analysis
4. Delineation of floodplains
5. Study report and documentation

The topographic mapping and hydrologic analysis tasks are described in a companion report titled "Gila Bend Canal Floodplain Delineation Study Hydrology Report", (Donohue, 1991). The present report focuses on the hydraulic analysis and floodplain delineation tasks. Study documentation is provided in appendices to each report and is repeated in a technical documentation notebook which has been prepared in the format required by the Arizona Department of Water Resources (ADWR, 1991). The study methods and report format are consistent with the FEMA floodplain study requirements.

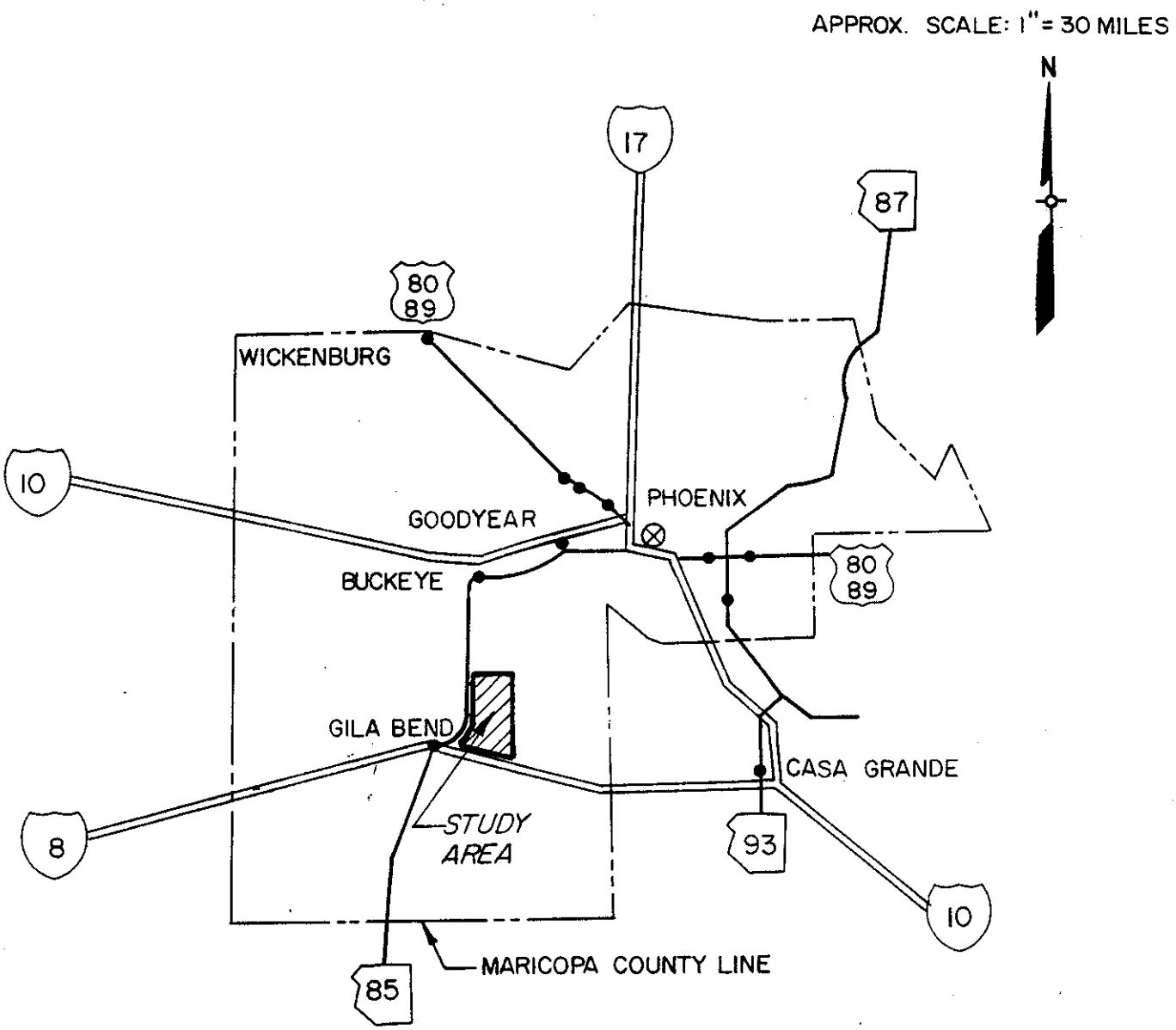
Floodplains along the entire study reach were determined by methods of detailed hydraulic analysis. The hydraulic analysis was conducted using the U.S. Army Corps of Engineers (COE) HEC-1 and HEC-2 computer models. Along most of the study reach, flooding is due to ponding against the east berm of the Gila Bend Canal. Flood elevations in these ponding areas were determined using HEC-1. In a reach of about 1.25 miles along the canal, flow is confined in a well-defined channel. The floodplain elevations for this reach were determined using the HEC-2 computer model.

The flood flows arriving at the flood hazard areas along the canal were determined using HEC-1. The hydrologic analysis and model development which lead to determining these flows is described in the accompanying "Gila Bend Canal Floodplain Delineation Study Hydrology Report" (Donohue, 1991). The Hydrology Report also provides an in-depth description of the geography and history of the study area.

2.2 Description of the Study Area

The study area is the eastern side of a 23-mile long reach of the Gila Bend Canal beginning at Gillespie Dam on the north, in Section 28 of Township 2 South, Range 5 West, Gila and Salt River Baseline and Meridian, Maricopa County, Arizona. The south end of the study reach is the Town Limits of Gila Bend in Section 32, Township 5 South, Range 4 West. This study area also includes portions of the following: T2S,R4W; T3S,R4W; and, T4S,R4W. The location of the study watershed within Maricopa County is indicated in Figure 1.

The Gila Bend Canal lies east of the Gila River between Old United States Highway 80 (US 80) and State Route 85 (SR 85) with both roads approximately parallel to the canal along most of the study reach. The distance from Old US 80 to the canal varies from approximately 75 feet to approximately 1/2 mile. The distance to SR 85 varies from 2,400 feet along the south half of the study area to over six miles at the north end of the study area.



NOVEMBER, 1991

FIGURE 1
STUDY LOCATION MAP

GILA BEND CANAL FLOODPLAIN DELINEATION STUDY

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The Gila Bend Canal begins at Gillespie Dam on the Gila River at Gila River Mile 166.58. The canal parallels the river and lies one to two miles to the east. The Gila Bend Canal is a trapezoidal channel with a typical bottom width of eight feet and typical side slopes of 1.5:1 and the average bottom slope is 0.002 ft/ft (1.06 ft/mile). The canal has a concrete lining up to a depth of eight to ten feet. At a depth of one foot below the top of the lining, the canal has a flow capacity of 350 cfs. The canal is excavated in most areas with built-up berms providing any required additional depth. The berms are as low as three to four feet in areas where the canal invert is deeply excavated and up to 15 feet tall in areas where the canal invert is high. The Gila Bend Canal begins at a supply spillway at Gillespie Dam. Eleven miles downstream of the dam, the Paloma Lift Station raises the flow approximately ten feet. The tallest berms in the study area are present in the reach downstream of the pump station. Cross-drainage structures along the canal convey runoff from the Gila River watershed east of the canal to the river. In large storms, flow ponds along the east berm of the canal create potential flood hazard areas.

The study area lies along the east berm of the Gila Bend Canal from Gillespie Dam (Mile 166.58) to the SR 85 bridge (Mile 142.66). A map of the region in the vicinity of the study area is provided in Figure 2. Several important physical features in the study area affect the hydraulic analysis. The northern five mile portion of the study area is dominated by both abandoned and active agricultural lands adjacent to the canal. Little Rainbow Valley Wash crosses the canal in the agricultural area. The wash is over 300 feet wide and is excluded from the detailed hydraulic analysis presented here because it is the subject of a separate study funded by the FCDMC.

South of the agricultural areas, near Mile 156.0, is the private Ski Lake recreational development. Ski Lake was constructed in 1989 adjacent to the canal berm. It consists of an impoundment created by construction of berms seven to ten feet higher than the surrounding land.

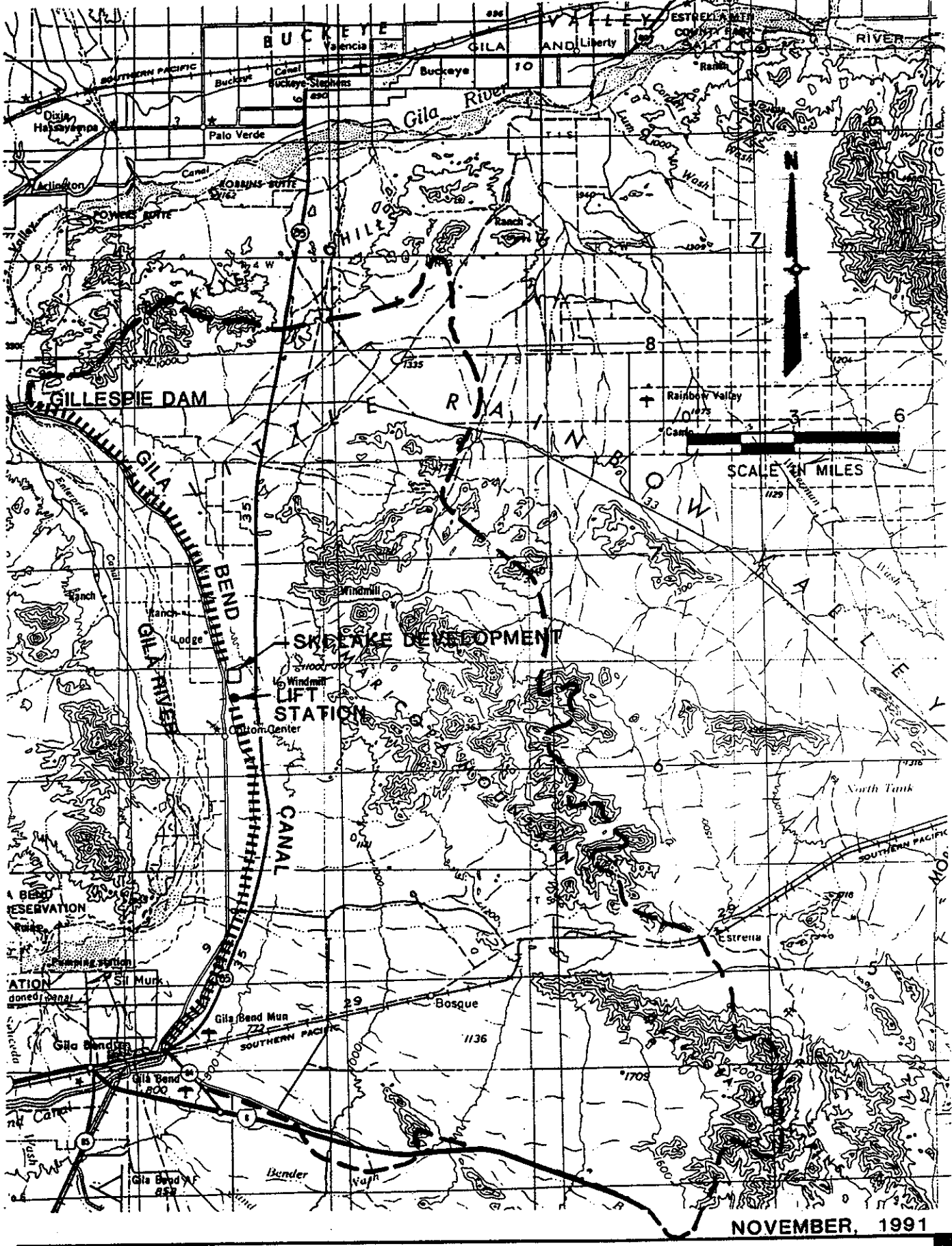

FIGURE 2
STUDY AREA
GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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A short distance south of Ski Lake is the Paloma Lift Station, which raises the canal flow approximately ten feet. Downstream from the lift station, the canal berms are as much as 15 feet high. In this area, a well-defined open channel exists along the east berm for a distance of 1.25 miles south from the lift station. The channel was constructed by La Paloma Ranch in the early 1980's to improve storm drainage. The south end of the channel empties into a series of broad areas where flow ponds during heavy storms. In all, ten major ponding basins have been identified along the southern 11.5 miles of the canal berm. Throughout this reach, the canal berm ranges from 4 to 14 feet in height above the adjacent ponding areas.

A watershed of 297 square miles is tributary to the study area adjacent to the canal berm. The runoff from this watershed drains to the Gila River west of the canal. The westward flow arrives at the berm in numerous braided channels. Drainage across the canal is provided at twelve spillways and approximately eight culverts under the canal. There are also at least thirteen "spill-to" pipes through the east berm which permit ponded flow to enter the canal. These cross-drainage spillways and culverts form the basis of much of the hydraulic analysis for this study because these structures are the hydraulic controls for ponding of flow along the east berm of the canal.

2.3 Principal Flood Problems

There are virtually no developments or inhabitants in the potential flood hazard area along the canal. The single exception is the Ski Lake development which is part of the motivation for delineating floodplains in the study area. Identification of the flood hazard area will assure that future development is neither at risk nor a cause of increased flooding.

Due to the very sparse population density, there are few eyewitness accounts of flooding in the area. Phone calls and visits to area residents and the published public notice did not produce specific recent information or photographs. The Woosley Peak Flood Protection District and Robert Stiel of La Paloma Ranch provided older (1976-1984) records and photographs that

indicated floods in the area are characterized by flows which rise and recede quickly with extensive ponding along the canal berm (Stiel, 1989). The photographs provided were generally taken after flows had receded and usually showed canal damage, erosion downstream, and damaged cropland. No photographs of high water east of the berm were available.

Major floods often result in some erosion or overtopping damage to the canal berms. Damage is usually limited to sections less than 100 feet wide. From time to time, large flows also damage Old US Highway 80 downstream of spillway outlets.

Donohue personnel visited the area shortly after a major storm in August, 1990. The storm produced large flows from spillway 5 on north to Rainbow Wash. Highwater marks indicated that extensive ponding had occurred against the east berm. There was evidence of berm overtopping at ten locations with damage to the canal berm at some of the overtopping sites.

2.4 Flood Protection Measures

The only measures in place which serve to reduce flood heights in the study area are the cross-drainage structures in the canal. These structures are owned and maintained by the canal owner, La Paloma Ranch. Maintenance of the canal structures is on an as needed basis, usually in reaction to damage. Several of the cross-drainage culverts under the canal were observed to be partly or completely filled with sediment and not functional. This condition is not a severe problem because even if they were clean, the pipes would provide little capacity in comparison to the spillway capacities or the cross-drainage flows.

3.0 ENGINEERING METHODS

3.1 Hydrologic Analysis

A hydrologic analysis was conducted on the study watershed using the COE HEC-1 hydrologic model. The 6-hour and 24-hour, 100-year precipitation events were analyzed. Precipitation was distributed through time using the FCDMC 6-hour distribution and the SCS type II 24-hour distribution. For the analysis, the watershed was delineated into 18 basins which were subdelineated into a total of 100 subbasins. Subbasin runoff was computed by the Green-Ampt method with the outflow hydrograph shape defined using the Phoenix Valley S-graph.

Subbasin outflows were combined as required and routed through downstream channels. Eighty-six routings and five interbasin diversions were represented in the hydrologic models. The diversions were employed to represent locations where channels could overflow and discharge across subbasin divides. Four HEC-1 models were formulated to compute basin outflows at nineteen flow concentration points. These basin outflows represent the flows arriving at the ponding areas adjacent to the Gila Bend Canal. The four HEC-1 models are identified by the names Rainbow (basins 1-6), Paloma (basins 7-10), Butterfield (basins 11-15), and Getzweiller (basins 16-18). A basin map is provided in Attachment 1. A detailed description of the HEC-1 model formulation, parameter estimation, and calibration of the HEC-1 models are provided in the previously referenced Hydrology Report.

The results of the hydrologic analysis are presented in Table 1. The table lists the nineteen flow concentration points which are identified by the corresponding HEC-1 model hydrograph name. The contributing watershed area at each flow concentration point is provided in the table. The flow results for the 6-hour and 24-hour storm analysis are given along with the computed flow per unit area and runoff volume. The computed runoff volume for point 7C5 is distorted by an inflow diversion which is large in comparison to the watershed runoff. The last column of Table 1, titled Critical Duration, is the storm duration yielding the larger peak flow. For the purpose of conducting the

TABLE 1

PEAK FLOWS AND RUNOFF VOLUMES
6-, AND 24-HOUR EVENTS

CONCENTRATION POINT	DRAINAGE AREA (sq.mi.)	6-HR EVENT Q100 (cfs)	6-HR EVENT q (csm)	6-HR EVENT Vol. (in.)	24-HR EVENT Q100 (cfs)	24-HR EVENT q (csm)	24-HR EVENT Vol. (in.)	CRITICAL DURATION (hr.)
1C1	7.31	2876	393	0.97	2454	336	0.86	6
300	3.78	2403	636	1.43	2187	579	1.30	6
4C6	50.49	8403	166	0.65	11565	229	0.90	24
500	3.17	1510	476	0.73	1599	504	0.77	24
6C3	13.74	4712	343	0.84	5297	386	0.86	24
7C4	22.51	2833	126	0.64	2854	127	0.66	24
7C5	0.64	1717	2683	13.07 (*)	1199	1873	9.35 (*)	6
8C6	18.39	3421	186	0.56	5417	295	1.07	24
9C2	3.51	1607	458	1.21	1459	416	0.97	6
10C2	9.41	4391	467	1.03	4885	519	1.59	24
11C2	11.43	2623	229	0.70	2676	234	0.63	24
12C3	18.22	2369	130	0.45	2757	151	0.48	24
13C3	36.41	2805	77	0.52	3330	91	0.63	24
14C2	10.20	1791	176	0.94	1882	185	0.85	24
15C14	65.15	2960	45	0.38	4971	76	0.59	24
15C15	1.36	843	620	1.64	641	471	1.26	6
16C4	11.54	2630	228	0.87	2609	226	0.85	6
17C2	7.59	2396	316	1.13	2333	307	1.05	6
18C1	1.85	1298	702	1.51	1060	573	1.19	6

NOTE:

(*) – Runoff volume at concentration point 7C5 is exaggerated by inter-basin diversion of flow in upstream areas.

hydraulic analysis, the 24-hour storm was selected because most of the basins where the 6-hour flow is critical must be combined with other 24-hour flows.

3.2 Hydraulic Analysis

Detailed hydraulic analyses were applied to determine 100-year base flood elevations throughout the study area. In ponding areas, which cover most of the study area, the COE HEC-1 model was used to compute flood elevations. In a 1.25 mile reach of defined channel flow, the COE HEC-1 and HEC-2 models were used to compute flood elevations.

In all areas, the HEC-1 models developed for the hydrologic analysis were extended by adding model elements for storage and flow through cross-drainage structures at the canal. Basin outfalls across the canal can occur through one of the twelve spillways, through cross-drainage culverts, through spill-to culverts, or by overtopping of the canal berm. Each outflow rating curve typically represents a combination of these outlets.

Initially, flow storage ponding areas were identified for each flow arriving at the canal berm. Frequently, subsequent analyses showed that adjacent ponding areas would merge into a single storage site during floods. In these cases, the inflows, storage volumes, and outflow rating curves were combined into a single routing operation.

The study area was divided into three reaches for hydraulic analysis as follows:

1. Ponding areas between Gillespie Dam and Ski Lake.
2. Ponding areas and the channel reach between Ski Lake and the south boundary of Basin 10, approximately three miles south of Ski Lake.
3. Ponding areas south of Basin 10 to SR 85.

Reach 1 covers basins 1 through 6 and part of basin 7. No delineation was performed for basin 4, the watershed of Little Rainbow Valley Wash. Floodplains for Little Rainbow Valley Wash are being determined in a separate study funded by FCDMC.

Reach 2 is basins 7 through 10. The HEC-1 models constructed for each of the first two reaches are overlapping combinations of the Rainbow and Paloma HEC-1 models developed in the hydrologic analysis. The models must overlap because there are shared subbasins whose flow is split by diversions between ponding areas north and south of Ski Lake.

Reach 3 covers basins 11 through 18 and uses extended versions of the Butterfield and Getzweiller HEC-1 models from the hydrologic analysis. Representative photographs of the study area are provided in Figures 3, 4, 5, and 6. Figures 3 and 4 are from Reach 1, Figure 5 is in Reach 2, and Figure 6 is also from Reach 2 but is typical of conditions in Reach 3 as well.

The following sections of this report present details of how the hydraulic analysis was conducted. First, general methods are presented for computing discharge rating curves and ponding storage volumes. Then, a discussion of the specific modeling approaches and results is provided for each of the three reaches of the study area as defined above.

General Methods

Drainage across the Gila Bend Canal is provided by twelve spillways and seven functioning corrugated metal culverts under the canal. The peak 100-year flows arriving at the canal generally exceed the capacities of the cross drainage structures and excess flows are stored in ponding areas adjacent to the east berm of the canal. In some areas, the ponding elevations rise above the canal berm crest and flow leaves the ponding area due to berm overtopping. In several locations, corrugated metal spill pipes have been installed just below the crest of the berm which also allow flow to enter the canal from the east.

FIGURE 3: SHALLOW PONDING AREA IN BASIN 2

FIGURE 4: SHALLOW PONDING AREA ADJACENT TO CROP LAND IN BASIN 5

FIGURE 5: WELL DEFINED CHANNEL IN BASIN 9
APPROXIMATE BOTTOM WIDTH IS 25 FEET
AND DEPTH FROM BERM CREST IS 15 FEET

FIGURE 6: PONDING AREA 9 IN BASIN 10
WITH EAST BERM IN FOREGROUND

This section presents the methods used to develop rating curves for the spillway flow, culvert flow, and berm overtopping, which control the basin outflows. Methods used to compute the quantity of available ponding storage is also presented. The locations of the hydraulic structures and ponding areas are shown in Attachment 1.

Spillways

The primary cross-drainage features in the Gila Bend Canal are eleven siphon spillways and the spillway at the Paloma lift station. The siphon spillways are typically trapezoidal in shape with concrete bottoms. The canal flow is conveyed under each spillway through inverted siphons built from one or two 96-inch pipes. The bottom widths of the spillways range from 7 to 120 feet and the top widths are between 40 and 300 feet. The spillways are typically 8 to 12 feet deep and are numbered from one to eleven beginning from the north. The Paloma lift station is located between spillways 4 and 5. A spillway is also located between the intake and discharge sides of the pump station. The pump station spillway is much narrower than the siphon spillways with a bottom width of 7 feet and a top width of 44 feet. This spillway has an earth bottom rather than concrete. Cross-section sketches based on field surveys of each spillway are provided in Appendix A.

Stage discharge rating curves for the spillways were computed using the spillway formula: $Q=C_sWH^{3/2}$ where Q is the spillway flow, C_s is the spillway coefficient, W is the spillway width, and H is the upstream head measured from the spillway invert. According to Brater and King (1976), the spillway coefficient typically varies between 3.9 and 4.6, depending on a variety of factors. One important factor is downstream support of the flow which is quite good in this case as compared to ogee shaped spillways (where $C_s=3.9$). The Gila Bend Canal spillways are flatter than an ogee spillway yet they are steep enough to assure critical flow will occur in the spillway. The value $C_s=4.0$ was selected for the analysis, recognizing these spillways should be more efficient than an ogee spillway while providing a reasonably conservative estimate of flow capacity. The coefficient was reduced to $C_s=3.2$ for the pump

station spillway to account for much greater influence of the sidewalls in this very narrow spillway.

The spillway width, W, was taken to be the average width of the flow in the spillway which depends on the depth of flow in the spillway throat. The depth was assumed to be two-thirds of the upstream head which is a well-known approximation of critical depth (Streeter, 1985). The parameter values and resulting rating curves for the spillways are provided in Appendix A.

Culverts

In some locations, additional cross-drainage is provided by culverts under the canal. In basin 18, there are three culverts 36, 48, and 60 inches in diameter and in basin 15 there are three culverts consisting of two 36-inch culverts and one 48-inch diameter culvert. Additional culverts in basins 5, 7, and 17 were not considered in the analysis because they were either non-functional due to sediment or they had negligible flow capacity due to their small size.

Discharge rating curves, for the culverts which were considered in the hydraulic analysis, were computed using the CULVERT routine of the FEQUTL computer program (Franz, 1991). A description of FEQUTL and the computed stage-discharge curves are provided in Appendix A. The required data for computing these rating curves are the culvert invert elevations, diameters, length, and inlet conditions. The culvert lengths were estimated from the 1"=400' scale work maps. The remaining data were determined from field surveys.

Spill-to Culverts

At thirteen locations in basins 5, 6, and 7, corrugated metal culverts, 24 or 30 inches in diameter, have been installed in the east berm of the canal above the canal lining. These pipes (called spill-tos in this report) allow ponded

flow east of the canal to pass into the canal. Discharge relations for the spill-tos were computed using the Federal Highway Administration HY8 computer program Version 3.2 (University of Florida, 1989). It was assumed that there would be no tailwater effect on flow through the spill-to pipes because the west berm of the canal is generally lower than the spill-to inverts. Therefore, the canal will overflow to the west rather than exerting backwater effects on the spill-tos.

Berm Overtopping

In many basins, particularly in basins 3, 5, 6, and 7, it is possible that ponding elevations could exceed the crest elevation of the east berm and flow would enter the canal. Berm overtopping has been observed in the past often resulting in damage to the canal berm due to erosion breach formation. Field observations after a storm in August, 1990 indicated that significant berm overtopping can occur without breaching the berm. Throughout the hydraulic analysis, it was assumed that berm overtopping could occur without causing a breach. This assumption provides a conservative floodplain elevation and is consistent with a directive given by the Arizona Department of Water Resources (ADWR, April 24, 1991).

Basins where, potentially, overtopping could occur were identified using the east berm profile shown in Attachment 2. Discharge rating curves for the flow over the berm were computed using the EMBANKQ routine from the FEQUTL computer program. EMBANKQ computes rating curves for flow over embankments according to the procedures specified in "Measurement of Peak Discharge at Dams by Indirect Methods", (USGS, 1967). The required data for the computations are the embankment profile, embankment width, and the height above the approach section. The computer input and output used in the hydraulic analysis are provided in Appendix A.

Ponding Area Storage

Storage of flows in ponding areas is the primary source of flooding in the Gila Bend Canal study area. Initially, 20 distinct ponding areas were identified. In general, there is one ponding area in each basin; however, no ponding areas were identified in basins 4 or 8 while two ponding areas were identified in basins 5 and 9 and three in basin 7. In completing the hydraulic analysis, it was determined that, in some cases, two or more of the ponding areas would merge during large floods to form a single ponding area. In such cases, the corresponding stage-storage relations were combined into a single storage relation. Ponding areas were numbered from south to north to minimize confusion with the basin numbering.

The stage-storage relations were obtained from the 1"=400' scale topographic maps. Storage relations for ponding areas 1 to 14 were obtained digitally from CAD drawing (DGN) files of the maps using the RoadCalc computer program (Engineering Data Systems, 1989). The remaining ponding area storage relations were computed by planimetering ponding surface areas and calculating increments of storage. Several spot checks of the RoadCalc computations were performed by planimeter. The computed stage-storage curves for each ponding area are provided in Appendix B.

Hydraulic Analysis of the Area North of Ski Lake

The area north of Ski Lake, previously identified as Reach 1 of the study area, consists of basins 1 through 6 and part of basin 7. Detailed hydraulic analysis for this area was conducted using the COE HEC-1 model which was used to determine 100-year ponding elevations ajacent to the east berm of the Gila Bend Canal. No in-depth hydraulic analysis was conducted for basin 4, the watershed of Little Rainbow Valley Wash, but it was retained in the model for future reference. The HEC-1 models developed in the hydrologic analysis portion of the study were extended through the addition of modified Puls routing operations to represent storage in ponding areas and outflow through

hydraulic structures or over the canal berm. The ponding areas and outflow structures incorporated in these routings for each basin are shown in Table 2. As indicated in Table 2, the flows from basins 1 and 2 and the flows from basins 6 and 7 were combined because it was determined the ponding areas in these basins will merge into single ponding areas. The corresponding stage-storage and stage-discharge relations were also combined.

The schematic of the HEC-1 model extensions employed in the analysis is shown in Figure 7. The hydrograph symbols along the right side of the schematic (1C2, 300, 4C6, 500, 6C3, and 7C4) are repeated from hydrologic analysis models. Operations shown to the left of these are the HEC-1 model extensions added for the hydraulic analysis. A listing of the HEC-1 model input and output is provided in Appendix C and the resulting 100-year flows and elevations are also provided in Table 2. The 100-year water surface elevations are the basis of the floodplain delineated for the basins indicated in the table.

Hydraulic Analysis of the Area South of Ski Lake and North of the Basin 10/Basin 11 Divide

The area south of Ski Lake to basin 10, previously identified as Reach 2 of the study area, consists of part of basin 7 and basins 8, 9, and 10. A detailed hydraulic analysis of this area was conducted primarily with the COE HEC-1 computer model. Floodplain elevations in a 1.25 mile channel reach in basin 9 were computed with the COE HEC-2 computer model using flows computed with HEC-1. As in Reach 1, the HEC-1 models developed in the hydrologic analysis were extended for the hydraulic analysis of Reach 2.

HEC-1 Analysis

Modified Puls routing operations were added to the hydrologic analysis models to represent ponding storage. In addition, two diversion operations were needed to represent splitting of basin 8 flow to the north and south at the canal berm.

Table 2

PONDING AREAS AND HYDRAULIC STRUCTURES MODELED IN THE HYDRAULIC ANALYSIS OF BASINS 1 THROUGH 7 NORTH OF SKI LAKE

Basins	Ponding Areas	Outflow Structures	Invert Elevations (feet)	Computed 100-Year Flow (cfs)	Computed 100-Year Water Surface Elevation (feet)
1,2	17,18	Spillway 1 Berm Overtopping	740.6 750.5	1930	750.6 → 750.4
3	16	Spillway 2	744.8	1570	750.6
4 *	--	Spillway 3	737.6	11570	--
5	14,15	Berm Overtopping (at Steel Bridge)	749.5	35	749.8
6,7	12A,12B,13	Spillway 4 4 Spill-tos Berm Overtopping (immediately north of Ski Lake)	742.4 745.0 748.6	5280	749.5

* Basin 4, Rainbow Wash, was not studied in detail

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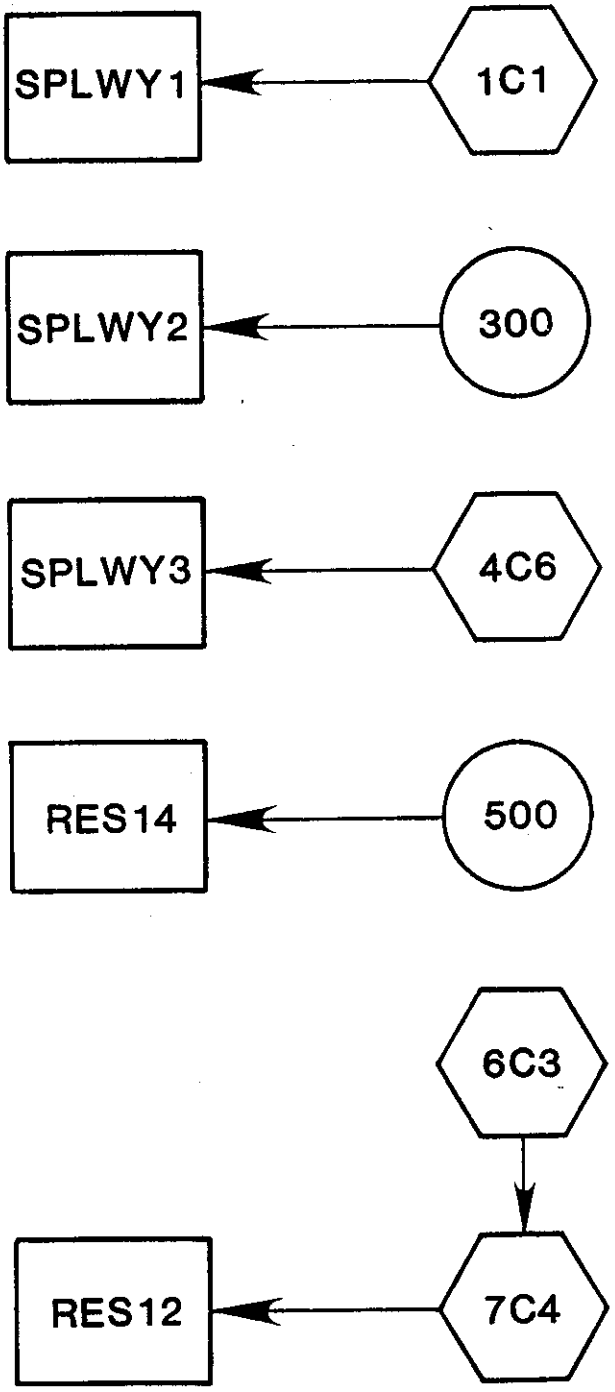

NOVEMBER, 1991

FIGURE 7
SCHEMATIC OF HEC-1 MODEL EXTENSIONS
FOR HYDRAULIC ANALYSIS OF BASINS 1 TO 7
GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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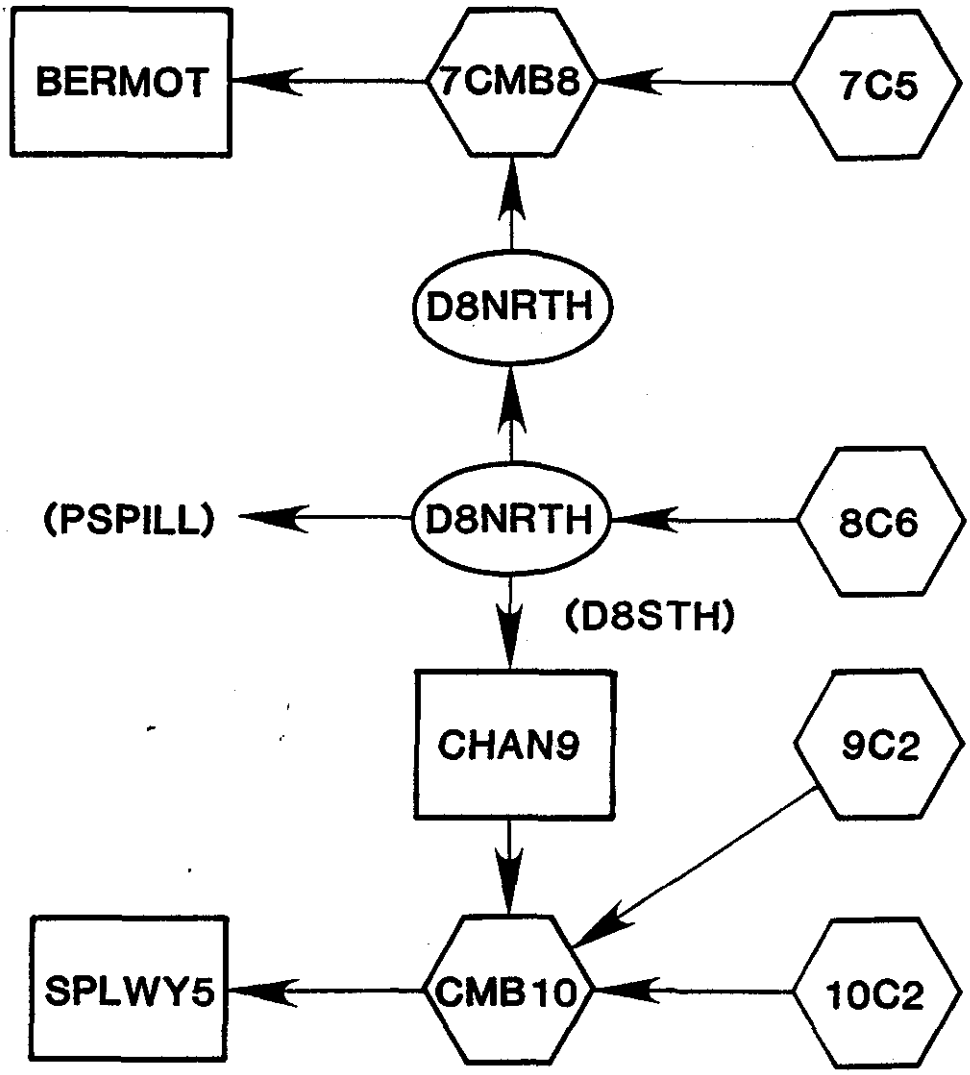
The schematic of the HEC-1 model extensions employed in the analysis is shown in Figure 8. The hydrographs 7C5, 8C6, 9C2, and 10C2 are repeated from the hydrologic analysis model. The flow from basin 8 (8C6) arrives at the canal berm just south of the Paloma lift station near a high point in the ground profile. Most of the flow is directed to the north but a substantial flow is diverted to the south and enters the deep channel in basin 9. A portion of the northward flow leaves the system through the pump station spillway while the remainder continues north to a ponding area in basin 7 immediately south of Ski Lake. Here, the flow is combined with basin 7 flow (7C5) and peak flows overtop the canal berm. The southward component of the basin 8 flow is routed through the deep channel in basin 9 which discharges to ponding storage areas 10 and 11 in the south end of basin 9. In the course of the hydraulic analysis, it was determined that the ponding areas in basin 9 would merge with the ponding area in basin 10 to form a single level pool with outflow through spillway 5. A summary of the storage areas and outflow structures represented in the hydraulic analysis is provided in Table 3.

Flow from basin 8 arriving at the canal berm splits into three components: southward flow into basin 9, discharge through the pump station spillway, and northward flow into basin 7. At the location where the flow arrives, the ground slope is downhill to the north; however, when the flow depth exceeds approximately one foot, flow can discharge to the south. The rate of flow from basin 8 into basins 7 or 9 is regulated by control sections at the respective basin divides. The flow from basin 8 into basin 9 is regulated by control section H3 and the flow from basin 8 into basin 7 is regulated by control section K. The rating curve for control section H3 was determined using the HEC-2 model of the deep channel because control section H3 coincides with cross section I in the HEC-2 model. The rating curve for control section K was determined using the FEQUTL routine CHANRAT which computes rating curves for channel sections of specified length and energy slope. These rating curves were used in conjunction with the rating curve of the pump station spillway to develop the diversion relations for the HEC-1 model. A diversion was developed to divide the basin 8 flow into a southward component over control section H3



NOVEMBER, 1991

FIGURE 8
SCHEMATIC OF HEC-1 MODEL EXTENSIONS
FOR HYDRAULIC ANALYSIS OF BASINS 7 TO 10
GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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Table 3

PONDING AREAS AND HYDRAULIC STRUCTURES MODELED IN THE HYDRAULIC ANALYSIS OF BASINS 1 THROUGH 10

Basins	Ponding Areas	Outflow Structures	Invert Elevations (feet)	Computed 100-Year Flow (cfs)	Computed 100-Year Water Surface Elevation (feet)
7	12C	Berm Overtopping 4 Spill-tos	748.4 742.5 745.4	3070	750.2
8	(Partly diverted to 11 and 12C)	Pump Station Spillway	742.5	2090	752.8 ?? How set this ??
9,10	9,10,11	Spillway 5	738.5	4710	744.3

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and a northward component. The northward component was then split between the pump station spillway and control section K. Computer analysis for the derivation of control section rating curves and a table illustrating the development of the diversion relations are provided in Appendix A.

HEC-2 Analysis

Flood elevations for the 1.25 mile reach of channel between Mile 153.84 and Mile 155.09 were computed using the COE HEC-2 model. Key elements of the model are the channel cross sections, Manning n-values, channel flows, and effective flow areas. Representative channel cross sections at intervals 400 to 1,200 feet were obtained electronically from the three-dimensional CAD drawings. Cross-section locations were selected according to changes in channel shape. The channel has several very narrow and fairly wide sections which are well represented by the nine cross sections selected for the model. Manning 'n' values were determined through application of Cowan's method as described in Chow (1959). The base 'n' value selected for the channel is 0.020 because the channel material is sand. This base value was increased according to the method to account for the frequent changes in cross-section width, uneven bottom profile, and a small amount of scrubby vegetation in the channel to arrive at the final computed value of n=0.045. The 'n' value in the overbank areas was found to be about the same except slightly more vegetation is present increasing the value to n=0.050. A summary of the 'n' value calculations is provided in Appendix D.

Effective flow areas were defined on X3 cards in HEC-2 to hydraulically limit expansions and contractions in the channel. The channel was restricted to a maximum expansion rate of one foot of width to four feet of length and a maximum contraction rate of one foot of width per one foot of length. The expansion and contraction coefficients used in the model were 0.5 and 0.3, respectively.

The cross-section flows assigned in the model were based on the HEC-1 results for the reach. A computed peak flow was available at the upstream and downstream ends of the reach. There is no appreciable inflow along the reach.

The difference in flow from the upstream to downstream end of the reach was prorated according to the distance between cross sections. Table 4 provides cross-section identification, discharges, effective flow width, and the computed 100-year water surface elevation at each cross section.

The HEC-2 model input and output and additional model documentation including cross-section plots are provided in Appendix D. A plot of the computed water surface profile is provided in Figure 9.

Hydraulic Analysis of the Area South of Basin 10

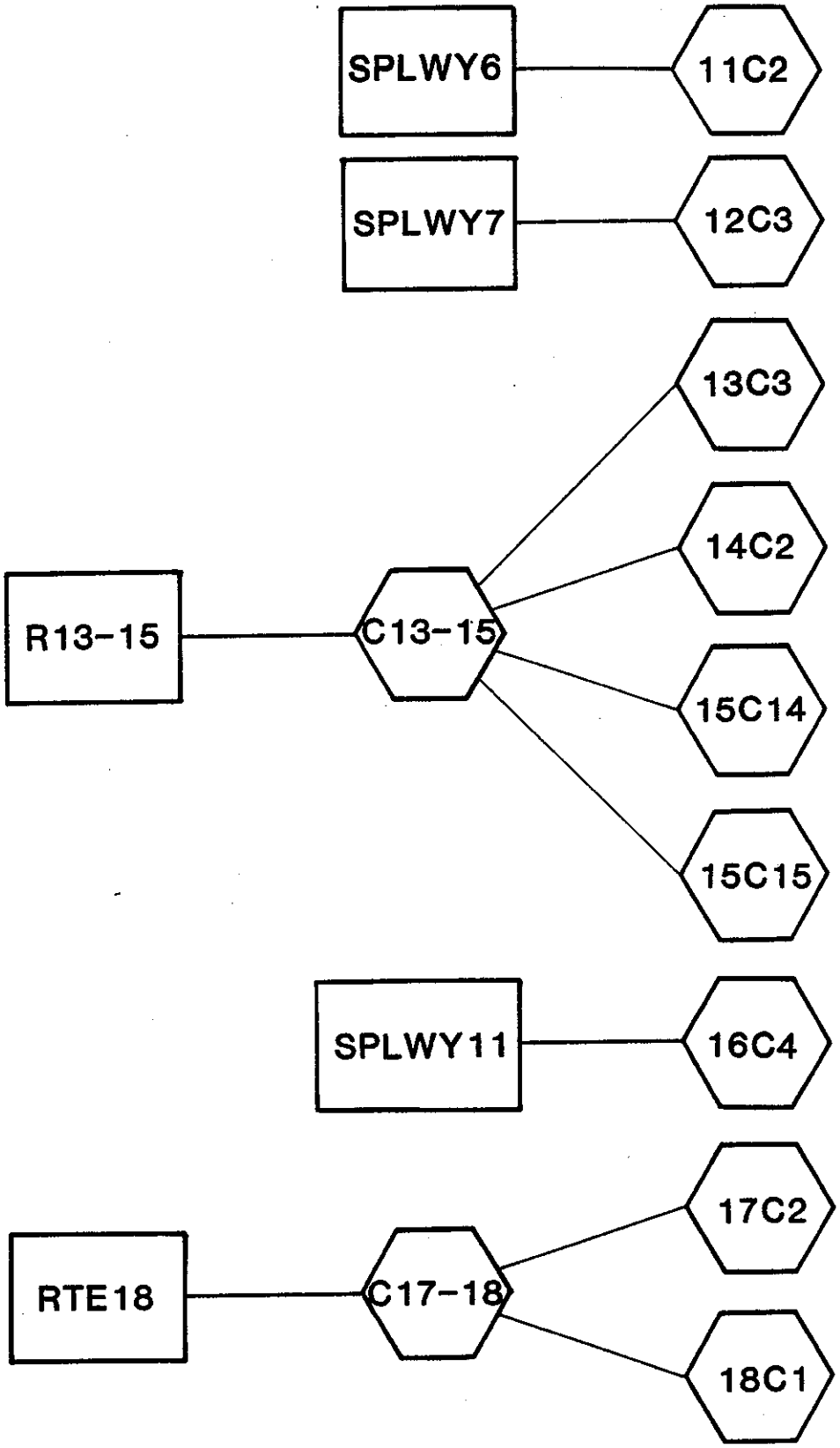
The area south of basin 10, previously identified as Reach 3 of the study area, consists of basins 11 through 18. Detailed hydraulic analysis for this area was conducted using the COE HEC-1 computer model which was used to compute 100-year water surface elevations in ponding storage areas along the canal berm. As in the other areas, the analysis was performed by extending the hydrologic analysis HEC-1 models by adding modified Puls routing operations. The ponding areas and outflow structures incorporated in the models of basins 11 through 18 are listed in Table 5. As shown, the ponding areas in basins 13, 14, and 15 and the ponding areas in basins 17 and 18 behave as single storage areas during large floods.

The schematic of the HEC-1 model extensions employed in the analysis is shown in Figure 10. Nine flows, shown on the right side of the figure, are repeated from the hydrologic analysis. A listing of the HEC-1 model input and output is provided in Appendix C and the computed 100-year flows and water surface elevations are also provided in Table 5.

Table 4

HEC-2 MODEL SUMMARY OF DISCHARGES AND CROSS-SECTION DATA FOR THE CHANNEL REACH IN BASIN 9

FIS Cross Section	Mile Station	Survey Identifier	Effective Flow Width from Berm (feet)	100-Year Flow (cfs)	100-Year Water Surface Elevation (ft NGVD)
A	153.84	67310	80	1005	744.60
B	153.99	66510	70	1040	749.92
C	154.22	65310	140	1092	751.39
D	154.37	64510	90	1127	751.93
E	154.60	63310	120	1179	752.54
F	154.83	62110	150	1231	752.65
G	154.92	61635	130	1252	752.60
H	154.98	61310	190	1266	752.81
I	155.09	60705	200	1290	752.82



NOVEMBER, 1991

FIGURE 10
SCHEMATIC OF HEC-1 MODEL EXTENSIONS
FOR HYDRAULIC ANALYSIS OF BASINS 11 TO 18
GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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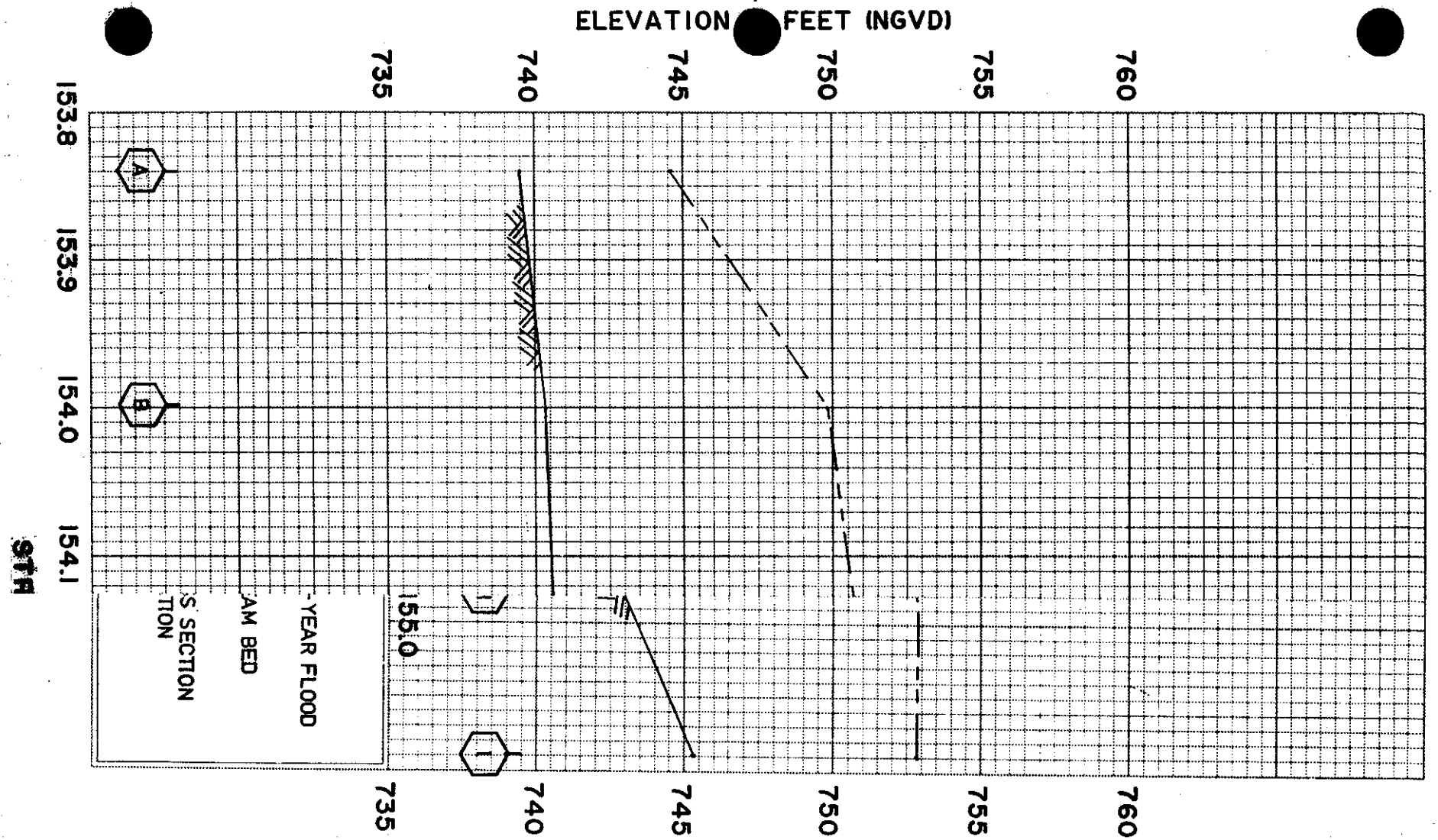

NOVEMBER, 1991

FIGURE 9

FLOOD PROFILE MILE 153.84 TO 155.09

GILA BEND CANAL FLOODPLAIN DELINEATION STUDY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

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Table 5

PONDING AREAS AND HYDRAULIC STRUCTURES MODELED IN THE HYDRAULIC ANALYSIS OF BASINS 11 THROUGH 18

Basins	Ponding Areas	Outflow Structures	Invert Elevations (feet)	Computed 100-Year Flow (cfs)	Computed 100-Year Water Surface Elevation (feet)
11	8	Spillway 6	734.6	2520	740.8
12	7	Spillway 7	735.6	2640	743.7
13,14,15	4,5,6	Spillway 8	737.5	7550	743.5
		Spillway 9	736.0		
		Spillway 10	737.5		
		3 Culverts	730.3		
16	3	Spillway 11	736.7 737.1	2440	742.8
17,18	1,2	3 Culverts	730.7	560	744.5 744.6

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4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The State of Arizona and Maricopa County have floodplain management programs and ordinances which are intended to promote sound land use planning. These activities include regulated development in flood hazard areas and promoting appropriate uses of floodplains. These management objectives will be enhanced by the publication of revised floodplain maps based on the analyses conducted in the Gila Bend Canal Study.

4.1 Flood Boundaries

The one percent annual risk, or 100-year, flood event has been adopted by FEMA as the national standard for floodplain management. The 100-year water surface elevation for each ponding area was determined in the detailed hydraulic analysis. A 100-year floodplain has been delineated on 1"=400' scale topographic maps by interpolating between the appropriate two-foot contours on the maps. The interpolation was performed digitally where possible and then checked and corrected in areas where the digital photogrammetric information was insufficient in the three-dimensional CAD drawings. In the channel reach, the floodplain extent was identified at each cross section and then manually interpolated between cross sections. The resulting floodplain maps are provided as Attachment 3. A comparison to the previous approximate method floodplain delineation is shown in Attachment 4. The previous delineation was performed using 1:24000 and 1:60000 scale maps rather than the 1:4800 scale topographic maps prepared for in the present study.

4.2 Floodways

The floodway concept is used to define the amount of floodplain encroachment that is considered acceptable when a small loss of floodplain storage is balanced against economic development needs. The principle is that limited encroachment is unlikely to have a significant, if any, effect on all but the severest flood events. A floodway consists of the main channel of a stream plus sufficient overbank area to convey the 100-year flood without increasing

flood heights by more than a specified depth. Federal standards limit the increase to one foot; however, many jurisdictions have much stricter standards. Normally, the floodway is determined by encroaching on the floodplain to reduce the conveyance by equal amounts on each side. The encroachment is increased gradually until the maximum allowable increase in depth is achieved.

The floodway concept does not apply to ponding areas because there is no conveyance. Therefore, floodways can only be defined in the Gila Bend Canal floodplain for the channel reach in basin 9. In this channel, the west edge of the main channel coincides with the top of canal berm. Under FEMA rules, no encroachment can be made on the west side of the channel because it would constrict the main channel. Thus, any encroachment must be on only the east side of the channel. However, all flow in this reach is contained within the main channel or is restricted by ineffective flow area. Additional encroachment beyond the effective flow area limit would violate the assumptions of the HEC-2 model. Encroachment up to the effective flow area limit could change stages slightly due to loss of storage. Conveyance capacity is maintained because the loss of ineffective flow area does not affect the channel conveyance. Therefore, the floodway boundaries for the channel reach were delineated to coincide with the effective flow area limits. Analysis of this floodway with HEC-2 showed no increase in water surface elevtion when all flow is confined to the floodway.

5.0 INSURANCE APPLICATION

Flood insurance studies are distributed to agents of the insurance, banking, and finance industry for their use in assessing rates to be imposed for providing flood insurance. For flood insurance rating purposes, flood insurance zone designations are assigned within the study area based on the methods and results of the hydraulic analysis. The zones assigned in the Gila Bend Canal study are Zone AO and Zone AE, which are defined in the following:

Zone AO:

Zone AO is the flood insurance rate zone for areas of 100-year shallow flooding where the average depth is one to three feet. Flood elevations are determined by detailed hydraulic analysis but the flood insurance maps show only the average depth of flooding to the nearest whole foot.

Zone AE:

Zone AE is the flood insurance rate zone for 100-year floodplains that are determined by detailed hydraulic analysis methods. Whole-foot base flood elevations derived from the analysis are shown at selected intervals within this zone.

Elevation reference marks (ERM) have been located and documented at approximately one-half mile intervals along the study area. The ERM's will aid in field determination of whether a site is in the flood hazard area. ERM locations are shown on the floodplain maps (Attachment 3) and a listing of the ERM's is provided in Appendix E.

6.0 OTHER STUDIES

Flood insurance studies of adjacent areas were examined and taken into account in conducting this flood insurance study. These studies include the following: Gila River, Gillespie Dam to Gila Bend (Cella Barr, 1989), and Maricopa County, Unincorporated Areas (FEMA, 1991).

7.0 LOCATION OF DATA

Information and pertinent data used in the preparation of this study is on file at the Flood Control District of Maricopa County, Engineering Department, at 2801 West Durango Street, Phoenix, Arizona 85009.

8.0 REFERENCES

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APPENDIX A

HYDRAULIC STRUCTURE RATING CURVE COMPUTATIONS

- Spillway Rating Curves
- Spillway Cross Sections
- Spill-to Rating Curves
- Spill-to HY8 Runs
- Culvert Rating Curves
- Culvert FEQUTL Runs
- Berm Overtopping Rating Curves
- Berm FEQUTL Runs
- Description of FEQUTL
- Diversion Flow Curve Computations
- Combined Flow Computations

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 1

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
741.0	0.4	0.2	6.7	5.8	6.4	740.6	2.86
742.0	1.4	0.9	7.7	49			
743.0	2.4	1.6	8.6	125			
744.0	3.4	2.2	9.6	237			
745.0	4.4	2.9	10.6	384			
746.0	5.4	3.6	11.5	571			
747.0	6.4	4.2	12.5	800			
748.0	7.4	4.9	13.4	1,072			
749.0	8.4	5.6	14.4	1,389			
750.0	9.4	6.2	15.3	1,755			
751.0	10.4	6.9	16.3	2,171			
752.0	11.4	7.6	17.2	2,639			

$\overline{W}$= 1/2(Wflow + Wbot)

Wflow= Wbot + d * r

$\overline{W}$= 1/2 (2*Wbot + d * r)

$\overline{W}$= Wbot + (d * r)/2

Q= Cs * $\overline{W}$ * H^2/3

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 2

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
744.8	0.0	0.0	23.0	0.0	23.0	744.8	2.22
745.0	0.2	0.1	23.1	8.3			
746.0	1.2	0.8	23.9	126			
747.0	2.2	1.5	24.6	321			
748.0	3.2	2.1	25.4	581			
749.0	4.2	2.8	26.1	899			
750.0	5.2	3.5	26.9	1,274			
751.0	6.2	4.1	27.6	1,704			
752.0	7.2	4.8	28.3	2,190			
753.0	8.2	5.5	29.1	2,731			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 3

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
738.0	0.1	0.1	120.1	10.9	120.0	737.9	4.27
739.0	1.1	0.7	121.5	546			
739.5	1.6	1.1	122.3	971			
740.0	2.1	1.4	123.0	1,475			
740.5	2.6	1.7	123.7	2,050			
741.0	3.1	2.1	124.4	2,689			
742.0	4.1	2.7	125.8	4,147			
743.0	5.1	3.4	127.2	5,827			
744.0	6.1	4.1	128.7	7,715			
745.0	7.1	4.7	130.1	9,803			
746.0	8.1	5.4	131.5	12,082			
747.0	9.1	6.1	132.9	14,549			
748.0	10.1	6.7	134.4	17,200			
749.0	11.1	7.4	135.8	20,032			
749.5	11.6	7.7	136.5	21,515			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 4

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
743.0	0.6	0.4	28.1	57.5	27.0	742.4	4.94
744.0	1.6	1.1	29.7	249			
745.0	2.6	1.8	31.3	538			
746.0	3.6	2.4	33.0	916			
747.0	4.6	3.1	34.6	1,385			
748.0	5.6	3.8	36.3	1,944			
749.0	6.6	4.4	37.9	2,595			
750.0	7.6	5.1	39.6	3,342			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 5

21–Nov–91

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T–B)/D=r
738.5	0.0	0.0	77.3	0.0	77.3	738.5	4.01
739.0	0.5	0.3	78.0	110			
739.5	1.0	0.7	78.6	315			
740.0	1.5	1.0	79.3	583			
741.0	2.5	1.7	80.6	1,275			
742.0	3.5	2.3	82.0	2,147			
743.0	4.5	3.0	83.3	3,181			
744.0	5.5	3.7	84.7	4,368			
745.0	6.5	4.3	86.0	5,700			
746.0	7.5	5.0	87.3	7,175			
747.0	8.5	5.7	88.7	8,790			
748.0	9.5	6.3	90.0	10,542			
749.0	10.5	7.0	91.3	12,432			
750.0	11.5	7.7	92.7	14,458			
751.0	12.5	8.3	94.0	16,621			
752.0	13.5	9.0	95.4	18,921			

$\overline{W}$= 1/2(Wflow + Wbot)

Wflow= Wbot + d * r

$\overline{W}$= 1/2 (2*Wbot + d * r)

$\overline{W}$= Wbot + (d * r)/2

Q= Cs * $\overline{W}$ * H^2/3

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 6

21–Nov–91

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T–B)/D=r
735.0	0.4	0.3	34.4	31.6	34.0	734.6	3.47
736.0	1.4	0.9	35.6	230			
737.0	2.4	1.6	36.7	538			
738.0	3.4	2.3	37.9	940			
739.0	4.4	2.9	39.1	1,430			
740.0	5.4	3.6	40.2	2,005			
741.0	6.4	4.3	41.4	2,664			
742.0	7.4	4.9	42.5	3,407			
744.0	9.4	6.3	44.8	5,149			
746.0	11.4	7.6	47.2	7,237			
748.0	13.4	8.9	49.5	9,680			
750.0	15.4	10.3	51.8	12,488			
752.0	17.4	11.6	54.1	15,673			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 7

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
737.0	0.5	0.4	26.6	42.2	26.0	736.5	3.38
738.0	1.5	1.0	27.7	212			
739.0	2.5	1.7	28.9	467			
740.0	3.5	2.4	30.0	799			
741.0	4.5	3.0	31.1	1,204			
742.0	5.5	3.7	32.3	1,682			
743.0	6.5	4.4	33.4	2,233			
744.0	7.5	5.0	34.5	2,858			
745.0	8.5	5.7	35.6	3,557			
746.0	9.5	6.4	36.8	4,333			
747.0	10.5	7.0	37.9	5,186			
748.0	11.5	7.7	39.0	6,119			
749.0	12.5	8.4	40.1	7,131			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 8

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
738.0	0.4	0.3	27.5	27.8	27.0	737.6	3.64
739.0	1.4	0.9	28.7	190			
740.0	2.4	1.6	29.9	445			
741.0	3.4	2.3	31.1	780			
742.0	4.4	2.9	32.3	1,194			
743.0	5.4	3.6	33.5	1,684			
744.0	6.4	4.3	34.8	2,251			
745.0	7.4	4.9	36.0	2,896			
746.0	8.4	5.6	37.2	3,621			
747.0	9.4	6.3	38.4	4,426			
748.0	10.4	6.9	39.6	5,313			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 9

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
737.0	0.6	0.4	44.6	89.3	44.0	736.4	3.08
738.0	1.6	1.1	45.7	380			
739.0	2.6	1.8	46.7	797			
740.0	3.6	2.4	47.7	1,320			
741.0	4.6	3.1	48.7	1,943			
742.0	5.6	3.8	49.8	2,660			
743.0	6.6	4.4	50.8	3,469			
744.0	7.6	5.1	51.8	4,369			
745.0	8.6	5.8	52.9	5,360			
746.0	9.6	6.4	53.9	6,440			
747.0	10.6	7.1	54.9	7,611			
748.0	11.6	7.8	55.9	8,873			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 10

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	21-Nov-91 Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T-B)/D=r
740.0	0.1	0.1	48.2	10.1	48.0	739.9	3.58
741.0	1.1	0.8	49.4	240			
742.0	2.1	1.4	50.6	633			
743.0	3.1	2.1	51.8	1,152			
744.0	4.1	2.8	52.9	1,784			
745.0	5.1	3.4	54.1	2,524			
746.0	6.1	4.1	55.3	3,368			
747.0	7.1	4.8	56.5	4,314			
748.0	8.1	5.4	57.7	5,363			
749.0	9.1	6.1	58.9	6,513			
750.0	10.1	6.8	60.1	7,765			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – SPILLWAY 11

21–Nov–91

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T–B)/D=r
737.5	0.4	0.2	40.6	35.0	40.0	737.1	4.63
738.0	0.9	0.6	41.3	132			
739.0	1.9	1.2	42.9	435			
740.0	2.9	1.9	44.4	859			
741.0	3.9	2.6	46.0	1,394			
742.0	4.9	3.2	47.5	2,035			
743.0	5.9	3.9	49.0	2,782			
744.0	6.9	4.6	50.6	3,635			
745.0	7.9	5.2	52.1	4,594			

GILA BEND CANAL
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FLOW CURVES – PUMP STATION SPILLWAY (BETWEEN 4 & 5)

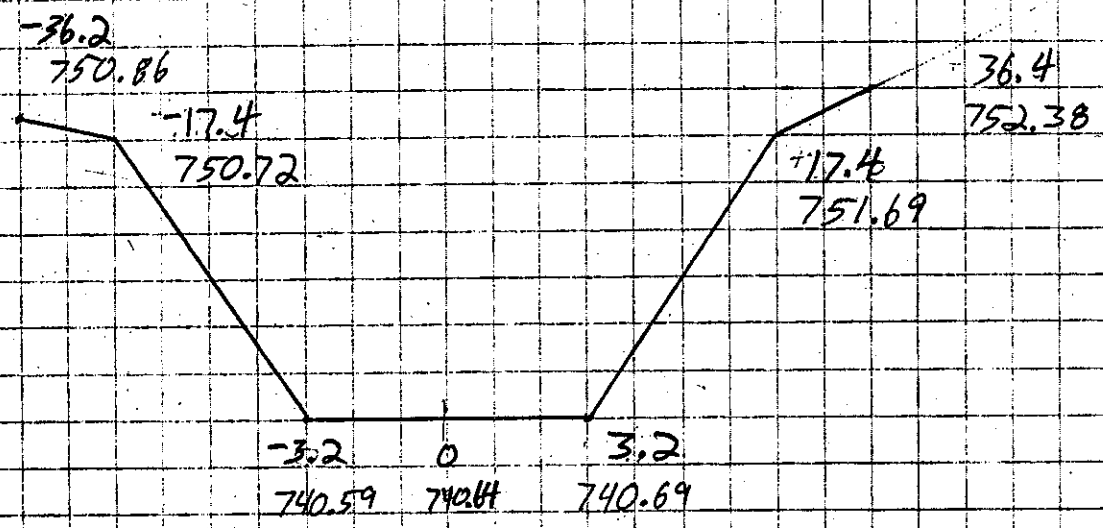
21–Nov–91

ELEVATION (ft)	H (ft)	d (2/3*H)	Ave $\overline{W}$	Q (cfs)	ACTUAL BOTTOM WIDTH	SPILLWAY ELEV	RATE OF CHANGE (T–B)/D=r
743.0	0.5	0.4	7.5	10	6.8	742.5	3.68
744.0	1.5	1.0	8.7	54			
745.0	2.5	1.7	9.9	129			
746.0	3.5	2.4	11.2	239			
747.0	4.5	3.0	12.4	385			
748.0	5.5	3.7	13.6	570			
749.0	6.5	4.4	14.8	796			
750.0	7.5	5.0	16.1	1,067			
751.0	8.5	5.7	17.3	1,384			
752.0	9.5	6.4	18.5	1,749			
753.0	10.5	7.0	19.8	2,166			
754.0	11.5	7.7	21.0	2,635			
755.0	12.5	8.4	22.2	3,159			

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT _____ DATE 3-28-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____

Cross-Sections



Siphon 1

Donohue
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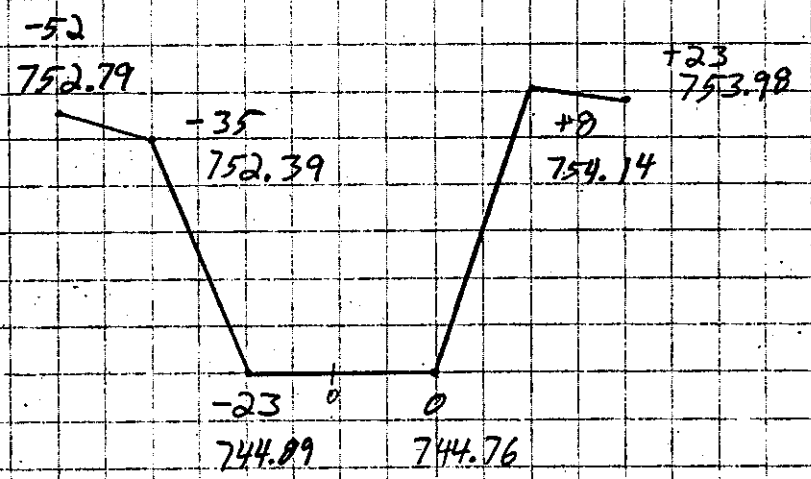
PHOENIX, ARIZONA

CLIENT _____ DATE 3-28-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 2

.06

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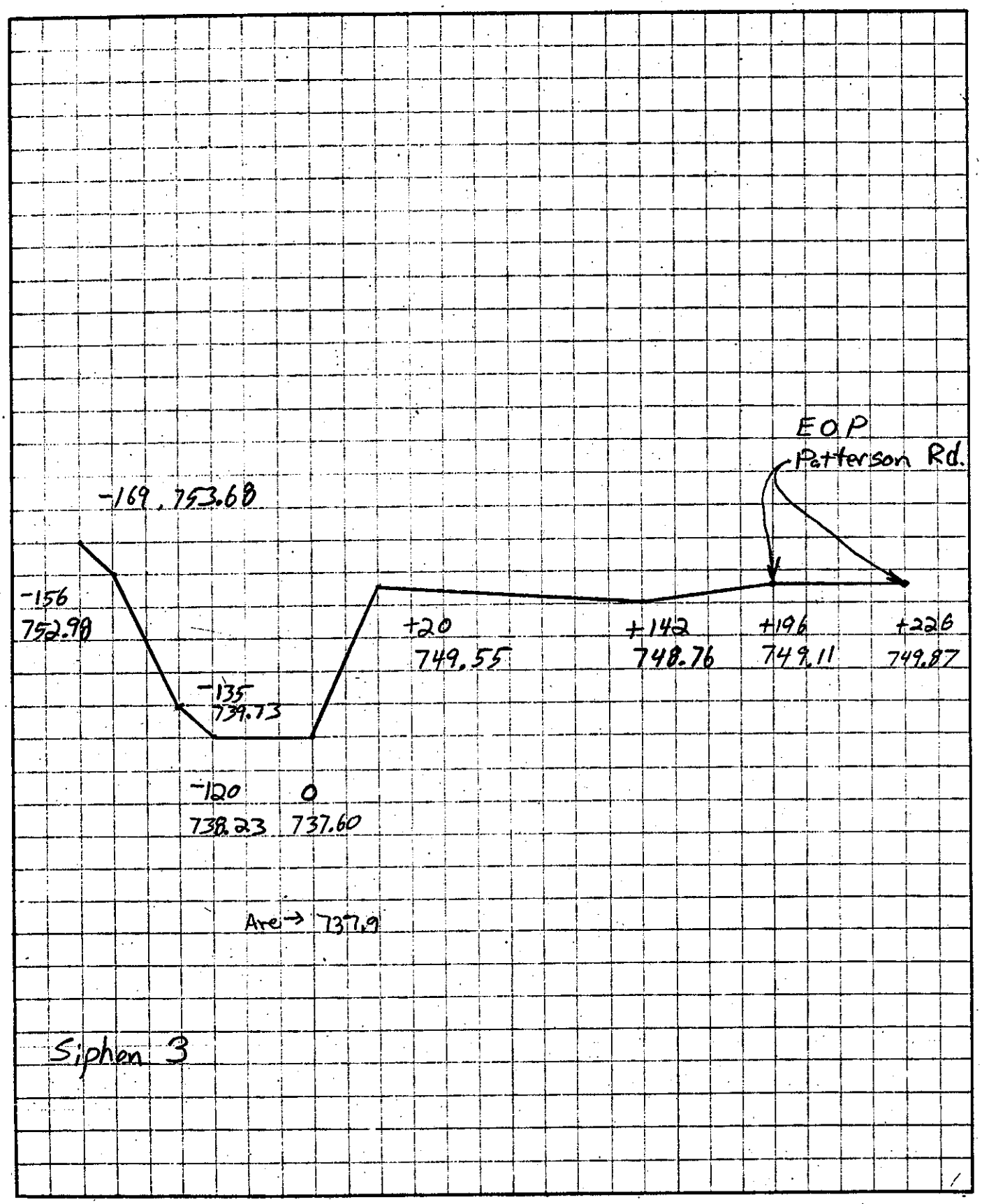
PHOENIX, ARIZONA

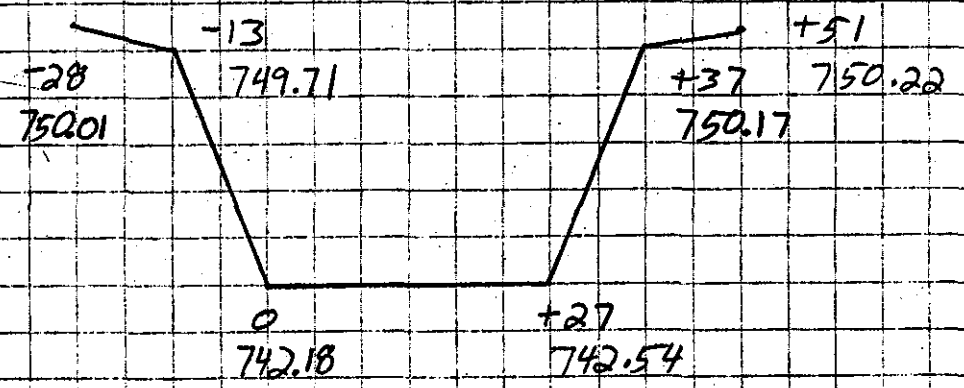
CLIENT _____ DATE 3-28-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 3

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT _____ DATE 3-28-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____

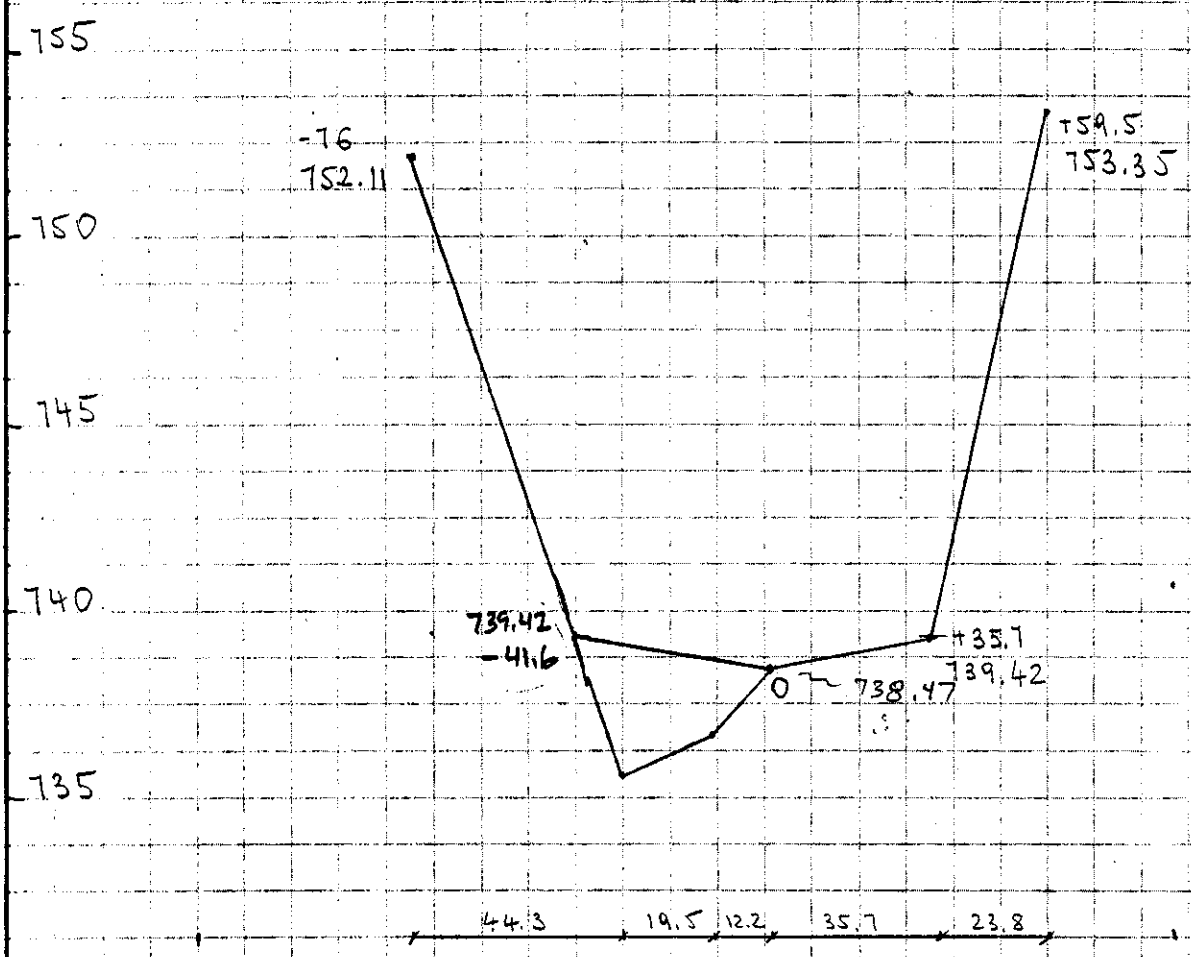


Siphon 4

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT Maricopa DATE 7/19/91
PROJECT Gila Bend BY HZP
PROJECT NO. _____ PAGE NO. ____

Looking Downstream
SPILLWAY #5

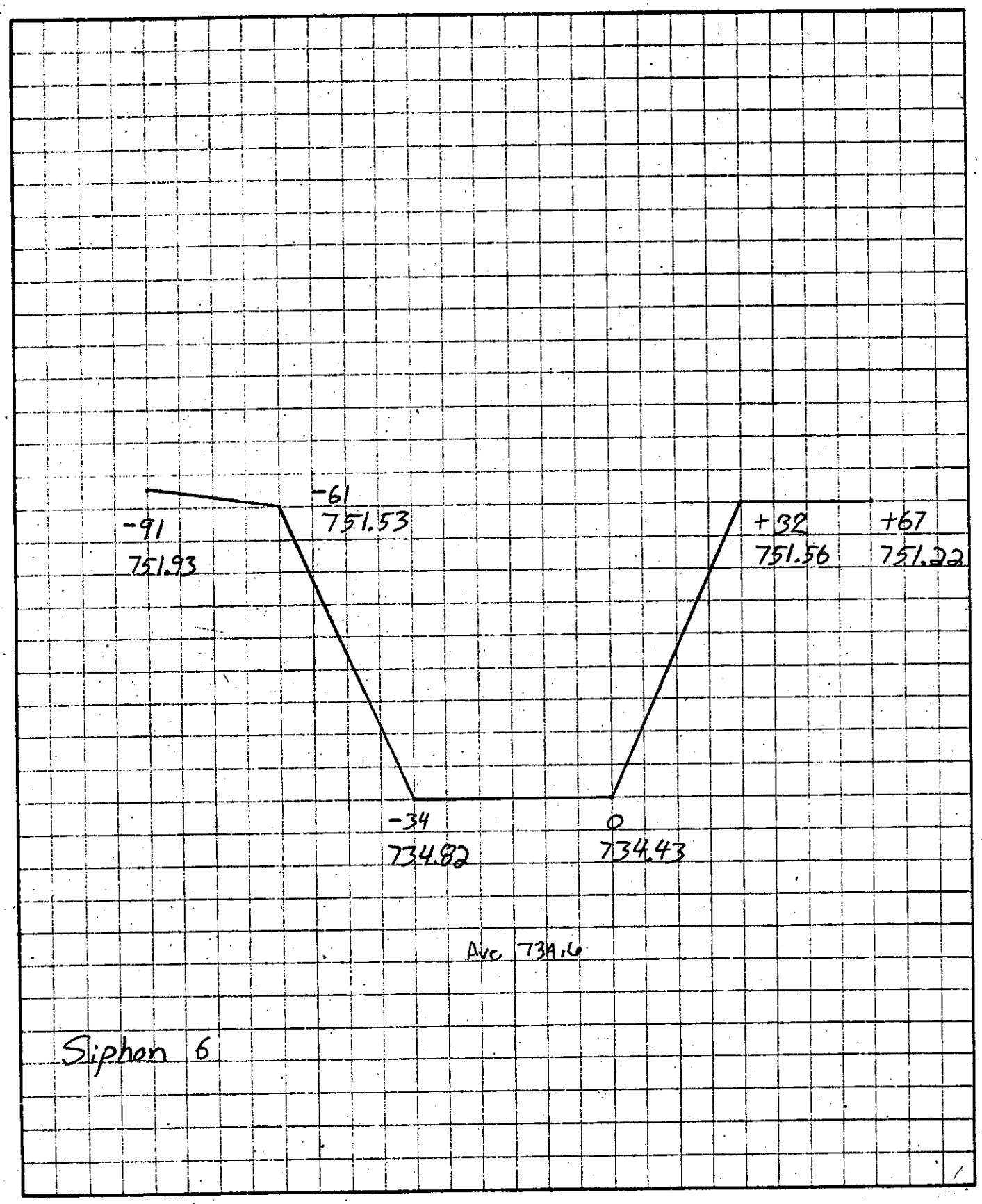


SCALE: HORIZ 1" = 40'
VERT 1" = 5'

Siphon 5

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

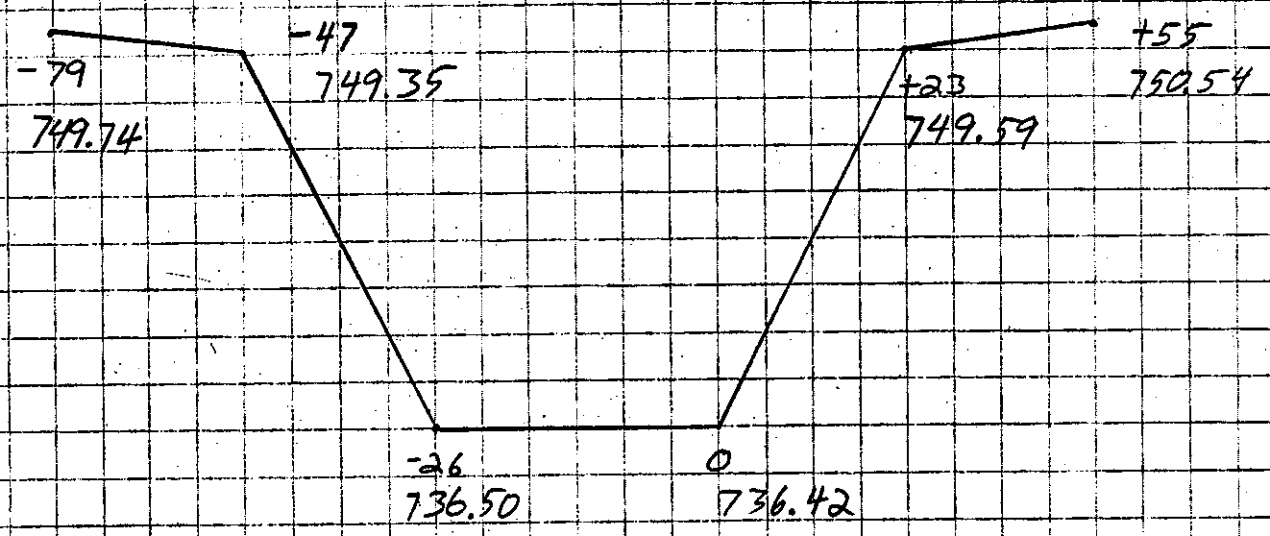
CLIENT _____ DATE 3-27-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 6

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

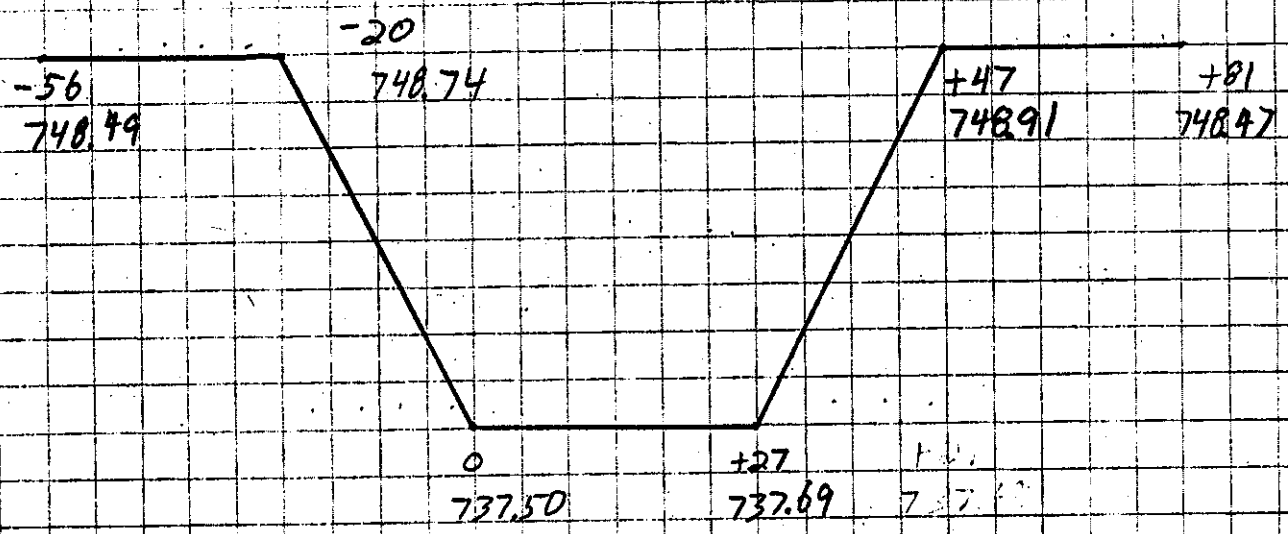
CLIENT _____ DATE 3-27-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 7

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

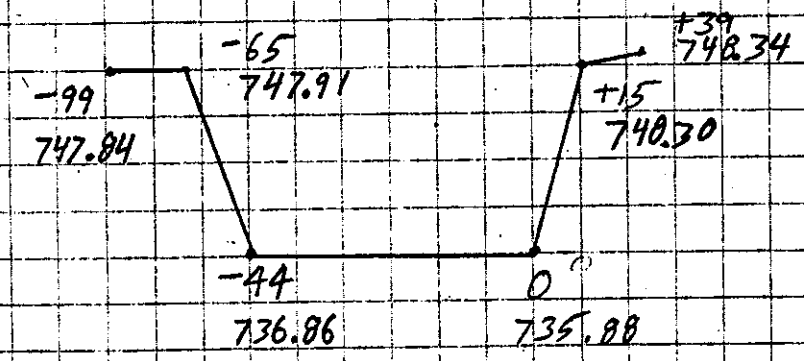
CLIENT _____ DATE 3-27-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 8

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT _____ DATE 3-27-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 9

Donohue
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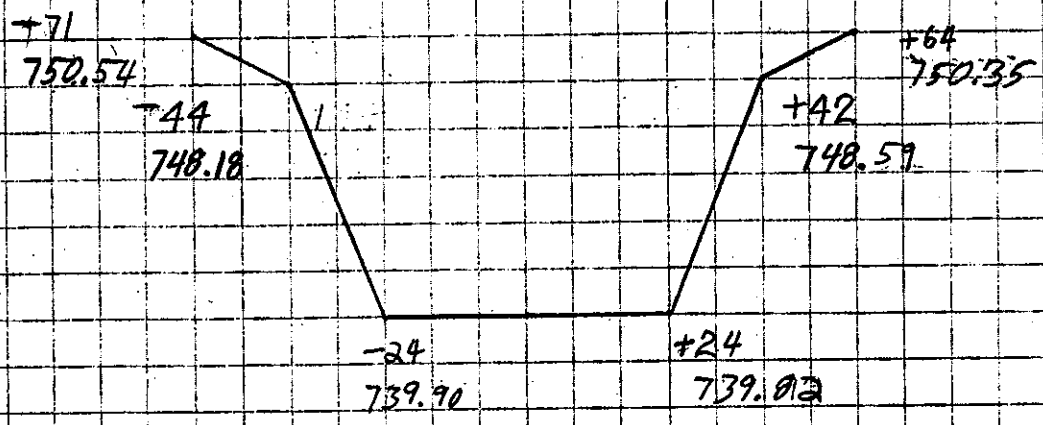
PHOENIX, ARIZONA

CLIENT _____ DATE 3-27-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 10

Donohue
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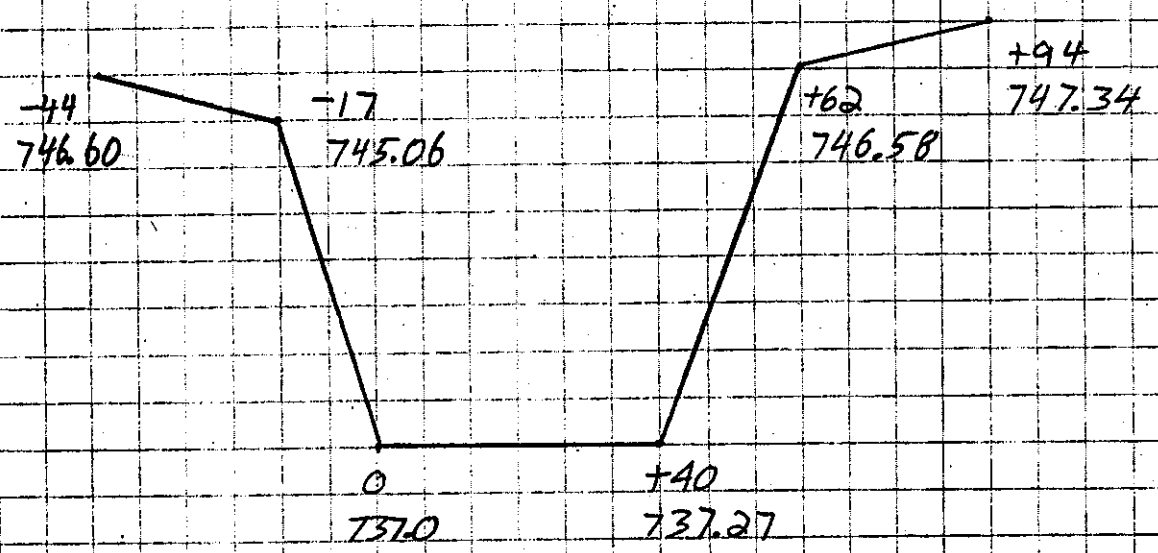
PHOENIX, ARIZONA

CLIENT _____ DATE 3-28-91
PROJECT _____ BY Jay
PROJECT NO. _____ PAGE NO. ____



Siphon 11

Donohue
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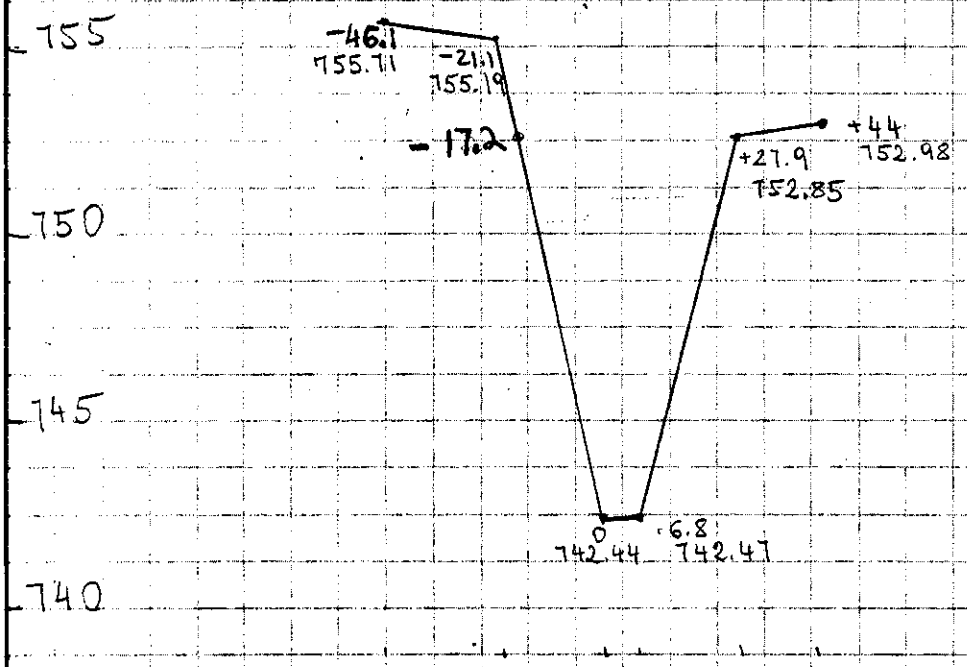
PHOENIX, ARIZONA

CLIENT MARICOPA **DATE** 7/22/91
PROJECT GILA BEND **BY** HZP
PROJECT NO. 18099 **PAGE NO.** ___

Pump Station Spillway



SCALE:
HORIZ 1" = 40'
VERT 1" = 5'

SPILL-TO FLOWS

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT FCDMC DATE 11-20/11-23
PROJECT Gila Bend BY EDL
PROJECT NO. _____ PAGE NO. ____

Spill-to Flows estimated
From HY8 Plotted Output

4 spill-to's in Basin 6		4 spill-to's in Basin 7 N of Ski Lake		4 spill-to's in Basin 7 S. of Ski Lake	
Elev	Flow	Elev	Flow	Elev	Flow
745.04	0	744.34	0	745.0	0
746.0	9	745.0	13	746.0	4
747.0	35	746.0	46	747.0	29
748.0	62	747.0	85	748.0	69
749.0	95	748.0	119	748.5	84
750.0	113	749.0	140	749.0	100
751.0	129	750.0	165	750.0	125
752.0	143			751.0	145

CURRENT DATE: 11-24-1991
CURRENT TIME: 05:10:41

FILE DATE: 11-23-1991
FILE NAME: BASIN6

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	745.04	744.50	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
2	745.46	745.00	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
3	745.66	744.41	60.01	1 CSP	2.00	2.00	.024	CONVENTIONAL
4	745.76	745.45	60.00	1 CSP	2.00	2.00	.024	CONVENTIONAL
5								
6								

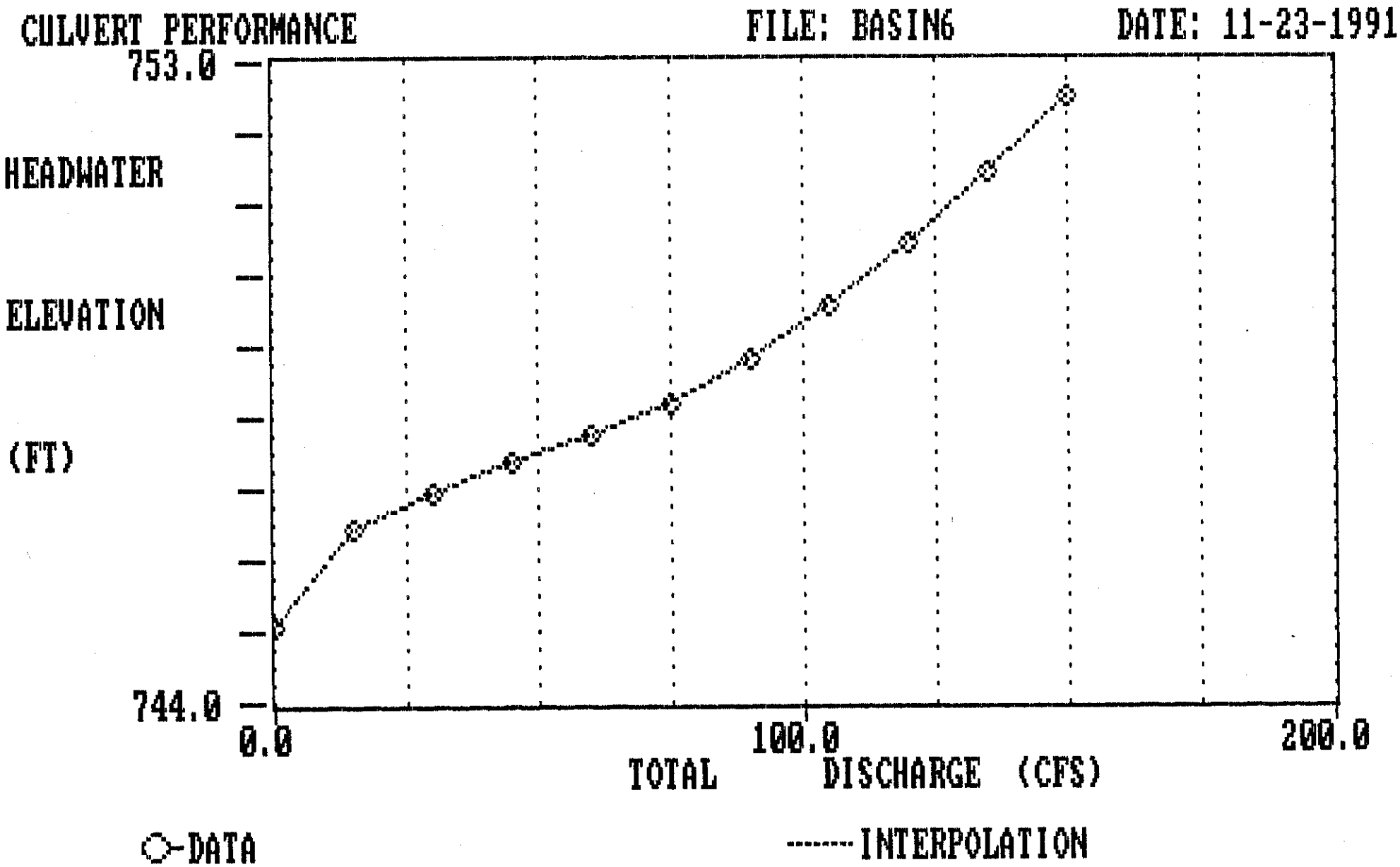
SUMMARY OF CULVERT FLOWS (CFS) FILE: BASIN6 DATE: 11-23-1991

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
745.04	0	0	0	0	0	0	0	0	0
746.47	15	7	4	3	2	0	0	0	5
746.96	30	12	8	6	4	0	0	0	3
747.37	45	16	12	9	7	0	0	0	2
747.78	60	21	16	12	10	0	0	0	3
748.21	75	26	21	15	13	0	0	0	4
748.79	90	30	27	19	15	0	0	0	3
749.55	105	34	31	22	18	0	0	0	3
750.44	120	38	36	24	21	0	0	0	2
751.41	135	43	41	27	24	0	0	0	2
752.48	150	48	46	30	27	0	0	0	3
799.00	465	146	145	87	86	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: BASIN6 DATE: 11-23-1991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
745.04	0.00	0	0	0.00
746.47	-0.00	15	0	0.50
746.96	-0.00	30	0	0.43
747.37	-0.01	45	0	0.75
747.78	0.00	60	-0	-0.11
748.21	-0.00	75	0	0.16
748.79	0.01	90	-0	-0.25
749.55	-0.00	105	0	0.00
750.44	0.00	120	-0	-0.05
751.41	0.00	135	-0	-0.01
752.48	0.01	150	-0	-0.06

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000


CULVERT PERFORMANCE
FILE: BASIN6
DATE: 11-23-1991
753.0
HEADWATER
ELEVATION
(FT)
744.0
0.0
100.0
200.0
TOTAL DISCHARGE (CFS)
DATA
INTERPOLATION

CURRENT DATE: 11-23-1991
CURRENT TIME: 20:44:35

FILE DATE: 11-23-1991
FILE NAME: GILA7UP

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	744.34	743.79	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
2	743.74	742.40	60.01	1 CSP	2.50	2.50	.024	CONVENTIONAL
3	744.48	744.18	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
4	744.33	744.02	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
5								
6								

SUMMARY OF CULVERT FLOWS (CFS) FILE: GILA7UP DATE: 11-23-1991

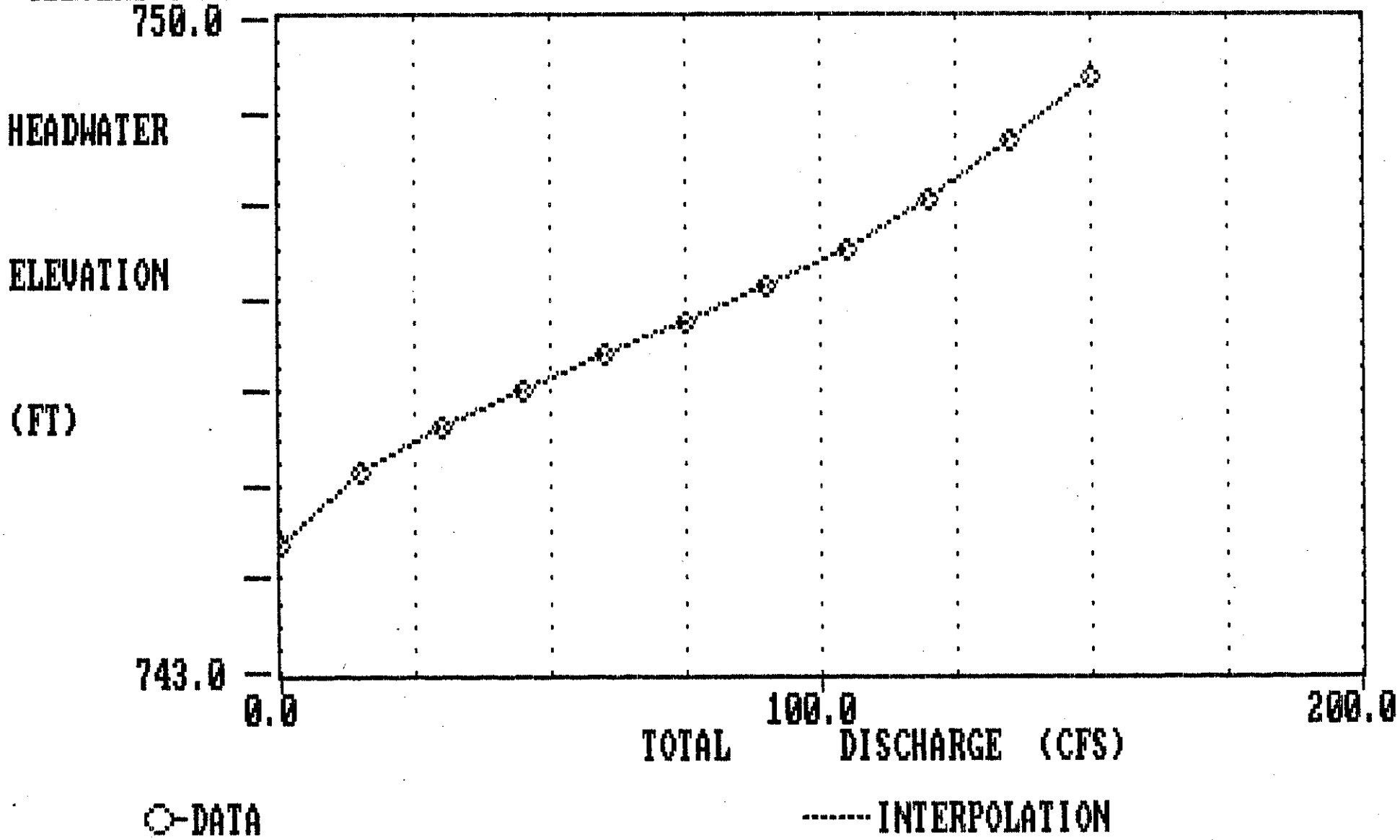
ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
744.34	0	0	0	0	0	0	0	0	0
745.15	15	2	8	2	3	0	0	0	3
745.63	30	6	13	5	6	0	0	0	3
746.03	45	9	18	8	10	0	0	0	3
746.39	60	13	21	12	13	0	0	0	2
746.76	75	17	25	16	17	0	0	0	2
747.11	90	22	28	19	21	0	0	0	3
747.51	105	26	31	23	25	0	0	0	4
748.07	120	30	35	27	28	0	0	0	3
748.71	135	33	39	31	32	0	0	0	3
749.39	150	37	43	35	36	0	0	0	3
799.00	590	147	149	147	147	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: GILA7UP DATE: 11-23-1991

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
744.34	0.00	0	0	0.00
745.15	-0.00	15	0	0.54
745.63	-0.00	30	0	0.53
746.03	-0.00	45	0	0.11
746.39	-0.01	60	0	0.41
746.76	0.01	75	-0	-0.39
747.11	0.00	90	-0	-0.03
747.51	-0.00	105	0	0.11
748.07	0.00	120	-0	-0.01
748.71	0.00	135	-0	-0.01
749.39	0.00	150	-0	-0.01

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

CULVERT PERFORMANCE FILE: GILA7UP DATE: 11-23-1991



CURRENT DATE: 10-16-1991
CURRENT TIME: 16:16:32

FILE DATE: 10-16-1991
FILE NAME: SPTO

Spillto's in Basin 7 S. of Ski Lake

FHWA CULVERT ANALYSIS
HY-8, VERSION 3.2

CULV	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (FT)	OUTLET ELEV. (FT)	CULVERT LENGTH (FT)	BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	745.67	745.66	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
2	745.35	745.34	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
3	745.41	745.40	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
4	745.48	745.47	60.00	1 CSP	2.50	2.50	.024	CONVENTIONAL
5								
6								

SUMMARY OF CULVERT FLOWS (CFS) FILE: SPTO DATE: 10-16-1991

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
745.67	0	0	0	0	0	0	0	0	0
746.16	6	1	2	2	2	0	0	0	7
747.06	30	6	9	8	7	0	0	0	3
747.47	45	9	13	12	11	0	0	0	3
747.84	60	13	16	16	15	0	0	0	3
748.20	75	17	20	19	18	0	0	0	3
748.70	90	21	23	23	22	0	0	0	3
749.24	105	25	27	27	26	0	0	0	3
749.84	120	29	31	30	30	0	0	0	3
750.51	135	33	35	34	34	0	0	0	2
751.21	150	37	38	38	38	0	0	0	3
800.00	585	146	146	146	146	0	0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SPTO DATE: 10-16-1991

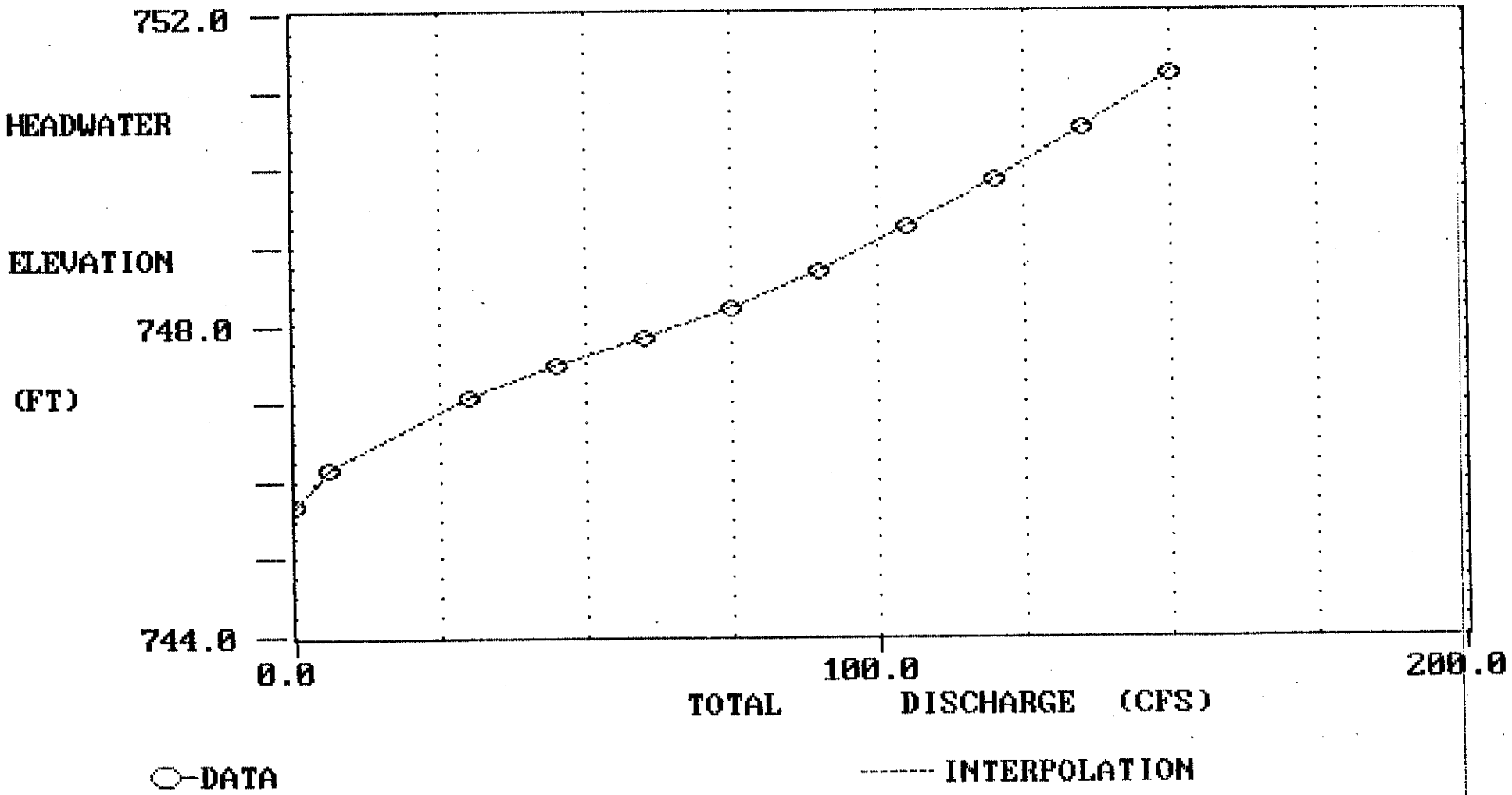
HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
745.67	0.00	0	0	0.00
746.16	0.00	6	-0	-0.83
747.06	-0.00	30	0	0.52
747.47	-0.00	45	0	0.15
747.84	-0.00	60	0	0.20
748.20	-0.01	75	0	0.40
748.70	0.00	90	-0	-0.05
749.24	0.00	105	-0	-0.04
749.84	0.00	120	-0	-0.03
750.51	0.01	135	-0	-0.16
751.21	0.00	150	-0	-0.01

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

4@ 30" Spillto's in Basin 7

CULVERT PERFORMANCE

FILE: SPTO D/s Ski Lake DATE: 10-16-1991



CULVERTS

3 in Basin 15

3 in Basin 18

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FCDMC DATE 10-27-91

PROJECT GILA BEND BY EDL CHKD

PROJECT NO. PAGE NO.

Basin 15 - 3 - spillunder pipes
Compute total flow

Elev.	36" Low Pipe Invert = 730.3 (cfs)	36"+48" High Pipe Invert 736.6 (cfs)	Total Flow (cfs)
730.3	0	0	0
731.0	3.8	0	4
732.0	15.8	0	15
733.0	28	0	28
734.0	39	0	39
735.0	47	0	47
736.0	55	0	55
736.6	59	0	59
737.0	61	2.3	63
738.0	67	22	89
739.0	72	54	126
~~740.0~~	~~84~~	—	
741.0	81	115	196
743.0	90	160	250
745.0	97	197	284

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FDMC DATE 7/24/91

PROJECT GILA BEND BY COJ CHKD EDL

PROJECT NO. _____ PAGE NO. _____

BASIN 1B - SPILLUNDER PIPES (3)

3 SPILLUNDERS COMBINED IN FEQ, LOWEST INVERT = 730.70
(3', 4', + 5' IN DIAMETER)

RATING CURVE

ELEV	DISCHARGE
730.70	0
731.70	7.7
732.70	14.2
734.7	164
736.7	273
738.7	365
740.7	441
742.7	507
745.	571
745.2	580
745.7	872
746.7	2595

FEQ UTL
CULVERT INPUT
BASIN 18 1/2

```
STDIN=       5
STDOUT=      6
STDTAB=      7
UNITS=  ENGLISH
NCMD=       16
FEQX         1
FLOODWAY     2
BRIDGE       3
CULVERT      4
FINISH       5
SAME         6
FEQXLST      8
ROADWAY      9
SEWER       10
MULPIPES    11
FTABIN      12
EMBANKQ     13
JUMP        14
CRITQ       15
GRITTER     16
MULCON      18
DZLIM= 1.0
NRZERO= 0.08
USGSBETA=NO
EPSARG= 0.0005
EPSF=  0.001
EXTEND=YES


FTABIN
TABLE#=  -15WEIRTABS
TABLE#= -1

* ANALYSIS OF BASIN 18 SPILL PIPES

MULCON
TABLE#=  300  SAVE12 NOOUT
WSLOT= 0.01
HSLOT= 25.0
NPIPES=   3
TYPE=       CIRC       CIRC       CIRC
SPAN=        3.0        4.0        5.0
RISE=        0.0        0.0        0.0
BOTT=        1.2        0.5        0.0
ROUG=      0.024      0.024      0.024

FEQX
TABLE#=-10  SAVE12 NOOUT NEWBETA
STATION=0
NAVM=0    SCALE=1.0         SHIFT=0.0
NSUB  1    0.025
OFFSET    ELEVATION   SUB  APPROACH SECTION
-70.0     800.0         1
-40.0     740.0         1
 40.0     740.0         1
 70.0     800.0        -1

CULVERT
TABLE#=218
TYPE=13
LABEL=SPILL UNDER IN SUBBASIN 18
APPROACH SECTION DATA
APPTAB#=10
APPELV=730.7
APPLEN=10
APPLOS=0.0
APPEXP=0.5
CULVERT DESCRIPTION
NODEID=YES
SFAC=1.0
NODE  NODEID    XNUM STATION    ELEVATION
100   UPSTRM     300  160       730.7


      DWNSTRM   300    0       729.7
-1
CULCLS=PIPE
DEPARTURE SECTION DATA
DEPTAB#=10
```

BASIN 18 2/2

```
DEPELV=729.0
LOSOPT=MOMENTUM
DISCHARGE COEFFICIENT DATA
KRB= 1.0
KWING=1.0
KPROJ=1.0
C46=0.84
ROADWAY DESCRIPTION
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
  OFFSET   CREST ELEV  WIDTH    APPROACH  SURFACE
-206.      799.0       15.00    731.00    GRAVEL
-205.      745.5
 205.      745.1
 206.      799.0       15.00    731.00    END
HEAD SEQUENCE DEFINITION
NFRAC=11
POWER=2.5
0.20
0.40
0.6
0.8
1.0
1.25
1.5
1.75
2.0
2.5
3.0
4.0
5.0
6.0
7.0
8.0
10.
12.
14.3
14.4
14.5
14.75
15.0
16.0
-1
```

FEQUTL
INPUT TO
CULVERT
BASIN 15 1/2

```
* ANALYSIS OF BASIN 15 SPILL PIPES
*  SINGLE LOW PIPE AND TWO HIGHER PIPES ANALYZED SEPARATELY

MULCON
TABLE#=  301  SAVE12 NOOUT
WSLOT= 0.01
HSLOT= 25.0
NPIPES=   1
TYPE=      CIRC
SPAN=       3.0
RISE=       0.0
BOTT=       0.0
ROUG=     0.024

CULVERT
TABLE#=215
TYPE=13
LABEL=SPILLUNDER IN BASIN 15 (LOW PIPE) DATUM:730.3
APPROACH SECTION DATA
APPTAB#=10
APPELV=730.5
APPLEN=10
APPLOS=0.0
APPEXP=0.5
CULVERT DESCRIPTION
NODEID=YES
SFAC=1.0
NODE  NODEID    XNUM STATION    ELEVATION
100   UPSTRM     301  160       730.3


      DWNSTRM   301    0       729.3
-1
CULCLS=PIPE
DEPARTURE SECTION DATA
DEPTAB#=10
DEPELV=729.0
LOSOPT=MOMENTUM
DISCHARGE COEFFICIENT DATA
KRB= 1.0
KWING=1.0
KPROJ=1.0
C46=0.84
ROADWAY DESCRIPTION
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
  OFFSET  CREST ELEV  WIDTH    APPROACH  SURFACE
-205.     746.5      15.00    731.00     PAVED
 205.     747.4      15.00    731.00     END
HEAD SEQUENCE DEFINITION
NFRAC=11
POWER=2.5
0.20
0.7
1.7
2.7
3.7
4.7
5.7
6.3
6.7
7.7
8.7
10.7
12.7
14.7
-1

MULCON
TABLE#=  302  SAVE12 NOOUT
WSLOT= 0.01
HSLOT= 25.0
NPIPES=   2
TYPE=      CIRC       CIRC
SPAN=       3.0        4.0
```

BASIN 18 2/2

```
RISE=        0.0        0.0
BOTT=        0.3        0.0
ROUG=      0.024      0.024

CULVERT
TABLE#=216
TYPE=13
LABEL=SPILLUNDER BASIN 15 (HIGH PIPES) DATUM:736.6
APPROACH SECTION DATA
APPTAB#=10
APPELV=736.8
APPLEN=10
APPLOS=0.0
APPEXP=0.5
CULVERT DESCRIPTION
NODEID=YES
SFAC=1.0
NODE   NODEID    XNUM STATION    ELEVATION
100    UPSTRM     302  160        736.6


       DWNSTRM    302    0        735.6
-1
CULCLS=PIPE
DEPARTURE SECTION DATA
DEPTAB#=10
DEPELV=735.0
LOSOPT=MOMENTUM
DISCHARGE COEFFICIENT DATA
KRB= 1.0
KWING=1.0
KPROJ=1.0
C46=0.84
ROADWAY DESCRIPTION
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
  OFFSET   CREST ELEV  WIDTH    APPROACH  SURFACE
-205.      999.9      15.00    731.00     PAVED
 205.      999.9      15.00    731.00     END
HEAD SEQUENCE DEFINITION
NFRAC=11
POWER=2.5
0.40
1.4
2.4
3.4
4.4
5.4
6.4
7.4
8.4
9.4
-1

FINISH
```

```
TABLE#=  218
TYPE=  -13
LABEL=SPILL UNDER IN SUBBASIN 18
NHUP=    24
NPFD=    10
HUP      2000-4 4000-4 6000-4 8000-4 1000-3 1250-3 1500-3 1750-3 2000-3 2500-3
FDROP    1064-3 1125-3 1183-3 1193-3 1241-3 1309-3 1376-3 1403-3 1460-3 1598-3
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 7909-5 2469-4 5146-4 8050-4 1328-3 2153-3 3115-3 4170-3 5676-3 8028-3
 1789-5 1722-4 5568-4 1169-3 2044-3 3148-3 5000-3 7260-3 9780-3 1259-2 1883-2
 4930-5 2378-4 8274-4 1773-3 3162-3 5002-3 7893-3 1148-2 1562-2 2026-2 3054-2
 1012-4 2378-4 9979-4 2183-3 4022-3 6491-3 1039-2 1535-2 2098-2 2749-2 4197-2
 1768-4 2380-4 1016-3 2335-3 4499-3 7448-3 1216-2 1815-2 2531-2 3350-2 5208-2
 2789-4 2378-4 1016-3 2335-3 4579-3 7846-3 1305-2 1974-2 2798-2 3762-2 5986-2
 4100-4 2378-4 1016-3 2335-3 4579-3 7848-3 1327-2 2018-2 2908-2 3967-2 6468-2
 5724-4 2378-4 1016-3 2335-3 4579-3 7848-3 1327-2 2020-2 2926-2 4022-2 6671-2
 7684-4 2378-4 1016-3 2336-3 4580-3 7850-3 1327-2 2020-2 2927-2 4028-2 6718-2
 1000-3 2301-4 9832-4 2268-3 4465-3 7655-3 1293-2 1969-2 2859-2 3936-2 6559-2
HUP      3000-3 4000-3 5000-3 6000-3 7000-3 8000-3 1000-2 1200-2 1430-2 1440-2
FDROP    1758-3 2159-3 2698-3 3399-3 3551-3 4627-3 6753-3 8877-3 1126-2 1136-2
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 1064-2 1429-2 1594-2 1748-2 1780-2 2026-2 2444-2 2801-2 3150-2 3164-2
 1789-5 2518-2 3390-2 3785-2 4148-2 4234-2 4826-2 5819-2 6663-2 7496-2 7528-2
 4930-5 4107-2 5613-2 6283-2 6890-2 7029-2 8014-2 9661-2 1106-1 1245-1 1250-1
 1012-4 5708-2 7990-2 9001-2 9872-2 1007-1 1148-1 1384-1 1585-1 1783-1 1791-1
 1768-4 7193-2 1048-1 1190-1 1306-1 1332-1 1518-1 1831-1 2098-1 2359-1 2369-1
 2789-4 8427-2 1288-1 1495-1 1641-1 1674-1 1909-1 2301-1 2636-1 2965-1 2978-1
 4100-4 9290-2 1493-1 1812-1 1992-1 2032-1 2318-1 2794-1 3200-1 3600-1 3615-1
 5724-4 9743-2 1628-1 2118-1 2370-1 2405-1 2743-1 3308-1 3789-1 4262-1 4281-1
 7684-4 9889-2 1683-1 2303-1 2702-1 2793-1 3186-1 3846-1 4406-1 4958-1 4980-1
 1000-3 9640-2 1641-1 2270-1 2733-1 3196-1 3650-1 4414-1 5068-1 5714-1 5740-1
HUP      1450-2 1475-2 1500-2 1600-2
FDROP    1146-2 1171-2 1197-2 1373-2
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 3515-2 1064-1 2719-1 1128+0
 1789-5 7893-2 1544-1 3633-1 2022+0
 4930-5 1289-1 2047-1 4131-1 2137+0
 1012-4 1832-1 2595-1 4682-1 2192+0
 1768-4 2413-1 3181-1 5272-1 2252+0
 2789-4 3024-1 3799-1 5895-1 2317+0
 4100-4 3664-1 4446-1 6548-1 2386+0
 5724-4 4332-1 5121-1 7230-1 2457+0
 7684-4 5034-1 5830-1 7946-1 2531+0
 1000-3 5798-1 6601-1 8719-1 2595+0
```

HEADS are read from Rows labelled "HUP"
Flows are read from Rows labelled "1000-3"

```
TABLE#=  215
TYPE=  -13
LABEL=SPILLUNDER IN BASIN 15 (LOW PIPE) DATUM:730.3
NHUP=    14
NPFD=    10
HUP      2000-4 7000-4 1700-3 2700-3 3700-3 4700-3 5700-3 6300-3 6700-3 7700-3
FDROP    1129-3 1282-3 1634-3 2139-3 2251-3 3328-3 4413-3 5057-3 5485-3 6562-3
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 1736-4 5460-4 1680-3 2168-3 2173-3 2654-3 3066-3 3281-3 3416-3 3739-3
 1789-5 3978-4 1426-3 3949-3 5160-3 5198-3 6329-3 7286-3 7804-3 8126-3 8891-3
 4930-5 6065-4 2262-3 6461-3 8578-3 8643-3 1051-2 1210-2 1296-2 1349-2 1476-2
 1012-4 7427-4 3008-3 9015-3 1225-2 1238-2 1506-2 1734-2 1856-2 1933-2 2114-2
 1768-4 7731-4 3551-3 1141-2 1621-2 1636-2 1991-2 2292-2 2453-2 2555-2 2795-2
 2789-4 7731-4 3847-3 1338-2 2033-2 2056-2 2501-2 2879-2 3082-2 3210-2 3511-2
 4100-4 7726-4 3927-3 1474-2 2453-2 2494-2 3033-2 3492-2 3740-2 3894-2 4259-2
 5724-4 7731-4 3927-3 1545-2 2790-2 2949-2 3586-2 4129-2 4420-2 4603-2 5035-2
 7684-4 7731-4 3927-3 1566-2 2923-2 3419-2 4158-2 4788-2 5126-2 5338-2 5839-2
 1000-3 7459-4 3807-3 1518-2 2835-2 3904-2 4749-2 5471-2 5859-2 6102-2 6678-2
HUP      8700-3 1070-2 1270-2 1470-2
FDROP    7634-3 9728-3 1176-2 1378-2
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 4030-3 4550-3 5004-3 5422-3
 1789-5 9590-3 1083-2 1191-2 1290-2
 4930-5 1592-2 1798-2 1978-2 2141-2
 1012-4 2281-2 2575-2 2833-2 3067-2
 1768-4 3015-2 3405-2 3745-2 4055-2
 2789-4 3787-2 4277-2 4704-2 5093-2
 4100-4 4594-2 5187-2 5705-2 6177-2
 5724-4 5431-2 6132-2 6744-2 7301-2
 7684-4 6299-2 7112-2 7821-2 8467-2
 1000-3 7206-2 8141-2 8957-2 9700-2
TABLE#=  216
TYPE=  -13
LABEL=SPILLUNDER BASIN 15 (HIGH PIPES) DATUM:736.6
NHUP=    10
NPFD=    10
HUP      4000-4 1400-3 2400-3 3400-3 4400-3 5400-3 6400-3 7400-3 8400-3 9400-3
FDROP    1152-3 1446-3 1804-3 2297-3 2981-3 3072-3 4151-3 5231-3 6297-3 7371-3
   PFD            Flows for HUP and Proportion of FDROP
 3162-6 5162-4 2883-3 5493-3 7148-3 7567-3 7649-3 8916-3 9989-3 1094-2 1185-2
 1789-5 1183-3 6792-3 1306-2 1612-2 1799-2 1823-2 2118-2 2376-2 2607-2 2819-2
 4930-5 1808-3 1097-2 2146-2 2675-2 2986-2 3027-2 3517-2 3946-2 4328-2 4681-2
 1012-4 2267-3 1487-2 3020-2 3828-2 4277-2 4337-2 5038-2 5652-2 6200-2 6706-2
 1768-4 2466-3 1818-2 3866-2 5054-2 5656-2 5734-2 6661-2 7474-2 8197-2 8866-2
 2789-4 2466-3 2049-2 4605-2 6318-2 7107-2 7205-2 8370-2 9391-2 1030-1 1114-1
 4100-4 2466-3 2173-2 5153-2 7527-2 8624-2 8741-2 1016-1 1140-1 1250-1 1352-1
 5724-4 2466-3 2211-2 5468-2 8610-2 1026-1 1034-1 1201-1 1348-1 1479-1 1599-1
 7684-4 2466-3 2216-2 5579-2 9097-2 1148-1 1200-1 1394-1 1565-1 1717-1 1857-1
 1000-3 2393-3 2154-2 5419-2 8893-2 1147-1 1371-1 1595-1 1791-1 1966-1 2128-1
```

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT _____ DATE _____

PROJECT _____ BY _____ CHKD _____

PROJECT NO. _____ PAGE NO. _____

CANAL BERM

OVERTOPPING ANALYSIS

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FDMC DATE 6/26/91

PROJECT GILA BEND BY CDJ CHKD

PROJECT NO. PAGE NO.

LOW BERM ELEVATION SUMMARY TABLE

SUBBASIN NO.	LOWEST BERM ELEVATION
1	753.3
2	750.4 *
3	751.5
4	750.20 *
5N	750.90
5S	749.50
6	749.80
7	748.40 *
8	753.80
9	752.00 *
10	751.00
11	750.80
12	748.90
13	748.40
14	746.60
15	746.50
16	746.40 *
17	746.60
18	745.50

* INDICATES ELEVATION WHICH APPEARED LOWEST ON THE PROFILE MAP, BUT DID NOT CHECK WITH THE ELEVATIONS ON THE TOPO MAPS.

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT MARICOPA CO. DATE 7/1/91

PROJECT FOMC - GILA BEND BY CDJ CHKD

PROJECT NO. 18099 PAGE NO. 1/2

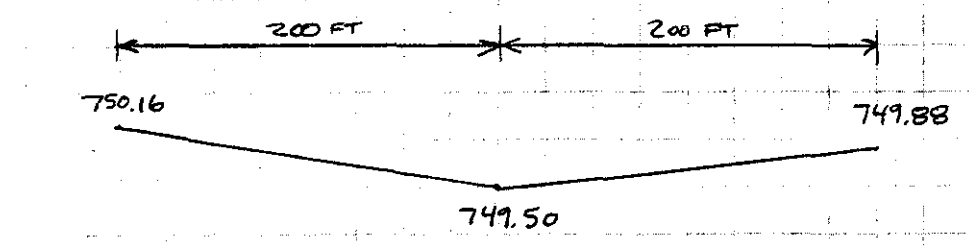
BERM X-SEC FOR OVERTOPPING LOCATION IN ~~S~~ BASIN 5

OVERTOPPING ELEVATION = 749.50 FT

SLOPES TAKEN OFF THE GILA BEND PROFILE OF TOP OF BERM

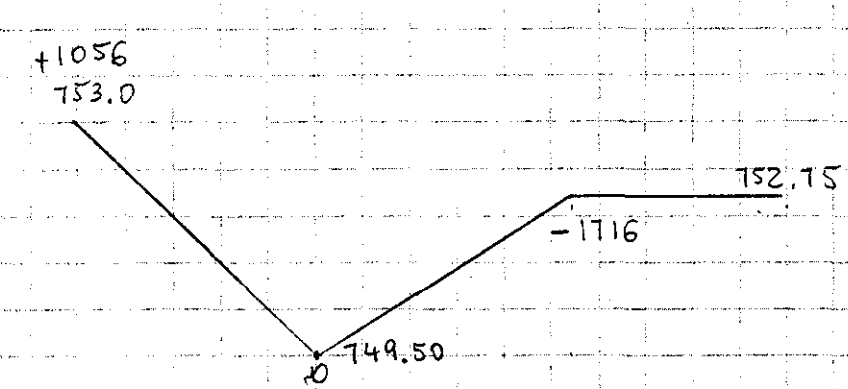
SLOPE GOING UPSTREAM THE LOW POINT = .0033

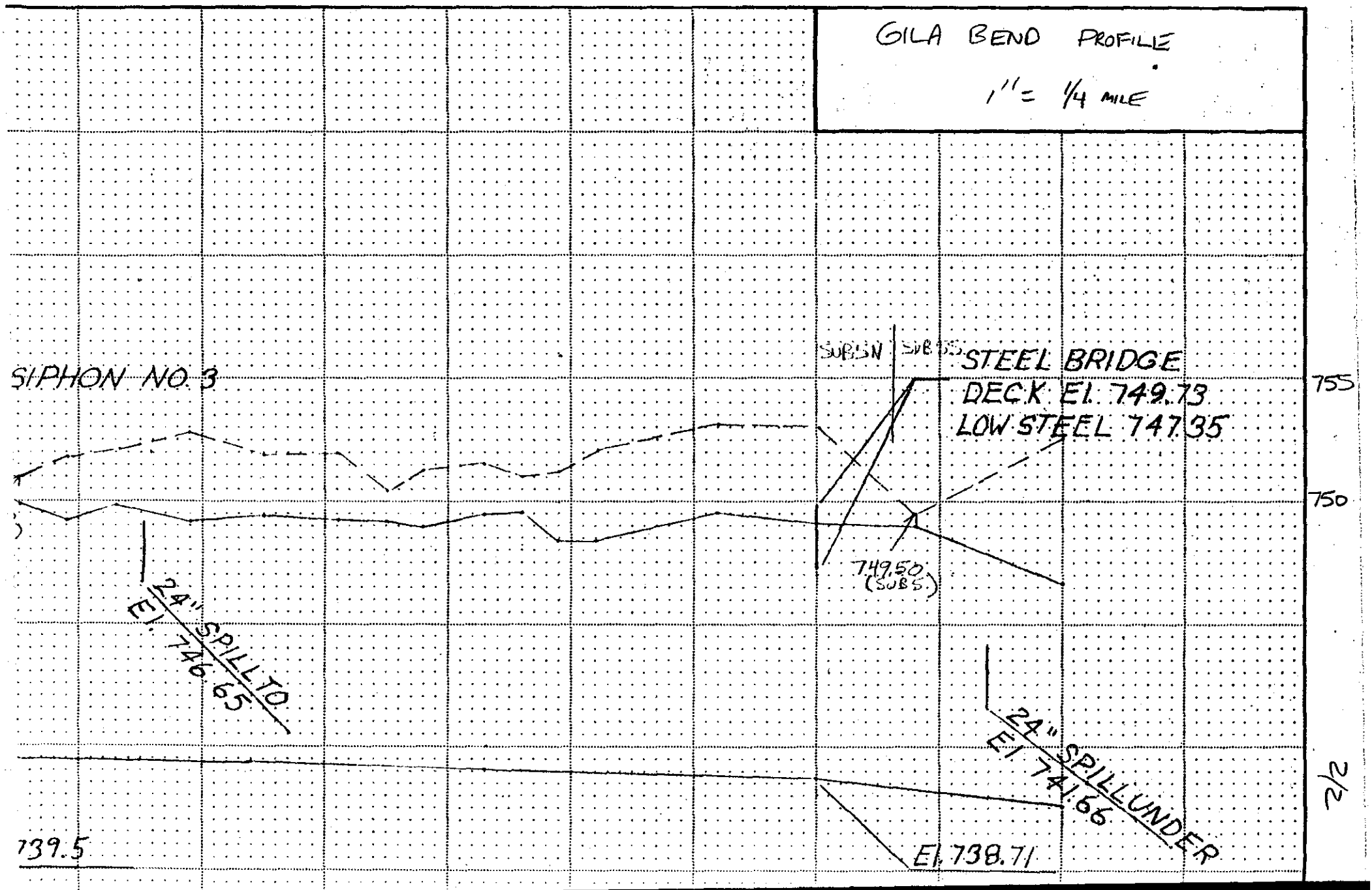
" " DOWNSTREAM " " " = .0019



← N

PROFILE FROM NORTH TO SOUTH




GILA BEND PROFILE
1" = 1/4 MILE
SIPHON NO. 3
SUBS N
SUBS S
STEEL BRIDGE
DECK El. 749.73
LOW STEEL 747.35
755
750
749.50
(SUBS.)
24" SPILL TO
El. 746.65
24" SPILL UNDER
El. 741.66
El. 738.71
739.5
2/2

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FCDMC DATE 9-26-91

PROJECT Gila Bend BY EDL CHKD

PROJECT NO. PAGE NO. 1/3

Basin 5 Total Flow

Start with Berm Overtopping only. Berm over tops at 749.5 near steel Bridge (Sheet 10).

Neglect Flow through Turner Draw and other 24" cross-drainage. due to small capacity

If Flood Elevation exceeds 751.5 then flow will go to Basin 6 also.

Use Attached Berm rating curve for initial outflow

EMBANQ INPUT


```
EMBANKQ
TABLE#= 5002 13
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
[illegible]TB=9997
[illegible]TB=9998
GSUBTB=9999
LABEL= BERM OVERTOPPING IN BASIN 5 JUST SOUTH OF STEEL BRIDGE
* USED TO CONSTRUCT HEC-1 STAGE DISCHARGE
  OFFSET  CREST ELEV  WIDTH    APPROACH  SURFACE
 -1716.     752.75     15.     748.00    PAVED
 -1584.     752.50     15.
     0.     749.5      15.
  1056.     753.0      15.     748.00    END
UPSTREAM HEADS TO USE IN COMPUTING THE TABLE
0.05
0.1
0.15
0.2
0.3
0.4
0.5
0.6
0.7
0.8
1.0
1.5
2.0
2.5
3.0
4.0
-1.0
```

9-26-91
P. 3/3

```
TABLE#= 5002
TYPE=  -13
LABEL= BERM OVERTOPPING IN BASIN 5 JUST SOUTH OF STEEL B
NHUP=   16
NFRD=   20
        5000-5 1000-4 1500-4 2000-4 3000-4 4000-4 5000-4 6000-4 7000-4 8000-4
HUP     1000-5 1998-5 2985-5 3969-5 5907-5 7795-5 9636-5 1142-4 1315-4 1484-4
  PFD          Flows for HUP and Proportion of FDROP
 2500-6 0000+0 9236-5 1712-4 5316-4 9833-4 2288-3 4282-3 7063-3 8929-3 1314-2
 1000-5 6460-5 2772-4 8569-4 1864-3 4935-3 9975-3 1727-2 2712-2 3982-2 5335-2
 2250-5 1292-4 6473-4 1888-3 4005-3 1092-2 2247-2 3940-2 6104-2 8884-2 1258-1
 4000-5 2215-4 1204-3 3419-3 6970-3 1949-2 4007-2 7037-2 1121-1 1651-1 2320-1
 6250-5 2732-4 1566-3 4443-3 9188-3 2540-2 5322-2 9429-2 1508-1 2263-1 3237-1
 9000-5 3372-4 1903-3 5333-3 1110-2 3082-2 6421-2 1133-1 1798-1 2664-1 3745-1
 1225-4 3727-4 2135-3 5946-3 1232-2 3427-2 7091-2 1248-1 1982-1 2936-1 4129-1
 1600-4 4060-4 2326-3 6477-3 1343-2 3736-2 7744-2 1364-1 2165-1 3211-1 4517-1
 2025-4 4377-4 2507-3 6980-3 1446-2 4019-2 8333-2 1465-1 2323-1 3435-1 4825-1
 2500-4 4610-4 2641-3 7338-3 1521-2 4227-2 8760-2 1541-1 2446-1 3620-1 5087-1
 3025-4 4822-4 2758-3 7670-3 1588-2 4414-2 9143-2 1607-1 2549-1 3770-1 5292-1
 3600-4 4964-4 2844-3 7909-3 1637-2 4552-2 9437-2 1659-1 2633-1 3894-1 5468-1
 4225-4 5086-4 2914-3 8107-3 1678-2 4663-2 9661-2 1697-1 2691-1 3979-1 5584-1
 4900-4 5172-4 2963-3 8246-3 1707-2 4744-2 9830-2 1727-1 2738-1 4049-1 5681-1
 5625-4 5223-4 2992-3 8324-3 1723-2 4789-2 9922-2 1744-1 2765-1 4089-1 5739-1
 6400-4 5265-4 3015-3 8388-3 1736-2 4825-2 9995-2 1756-1 2785-1 4116-1 5776-1
 7225-4 5295-4 3033-3 8438-3 1747-2 4853-2 1005-1 1766-1 2800-1 4138-1 5806-1
 8100-4 5319-4 3047-3 8474-3 1754-2 4874-2 1010-1 1773-1 2812-1 4156-1 5830-1
 9025-4 5338-4 3058-3 8507-3 1761-2 4892-2 1013-1 1780-1 2822-1 4170-1 5850-1
 1000-3 5345-4 3062-3 8517-3 1763-2 4898-2 1015-1 1782-1 2825-1 4175-1 5857-1
HUP     1000-3 1500-3 2000-3 2500-3 3000-3 4000-3
FDROP   1803-4 2516-4 3119-4 3611-4 4015-4 4611-4
  PFD          Flows for HUP and Proportion of FDROP
 2500-6 2150-2 5677-2 1141-1 1845-1 4490+0 1010+1
 1000-5 9411-2 2399-1 4645-1 3050+0 5298+0 1136+1
 2250-5 2148-1 5784-1 1134+0 3956+0 6802+0 1364+1
 4000-5 4101-1 1187+0 3031+0 5496+0 9122+0 1785+1
 6250-5 5831-1 1690+0 3594+0 6665+0 1094+1 2323+1
 9000-5 6619-1 1879+0 4013+0 7252+0 1194+1 2476+1
 1225-4 7305-1 2084+0 4389+0 7933+0 1286+1 2642+1
 1600-4 7995-1 2255+0 4741+0 8480+0 1366+1 2786+1
 2025-4 8515-1 2404+0 5030+0 8973+0 1440+1 2926+1
 2500-4 8985-1 2523+0 5278+0 9387+0 1501+1 3037+1
 3025-4 9331-1 2624+0 5465+0 9694+0 1548+1 3145+1
 3600-4 9628-1 2696+0 5616+0 9943+0 1586+1 3218+1
 4225-4 9836-1 2756+0 5730+0 1014+1 1618+1 3285+1
 4900-4 1001+0 2800+0 5823+0 1030+1 1643+1 3341+1
 5625-4 1011+0 2831+0 5890+0 1043+1 1663+1 3383+1
 6400-4 1017+0 2850+0 5929+0 1051+1 1677+1 3420+1
 7225-4 1022+0 2861+0 5952+0 1055+1 1686+1 3449+1
 8100-4 1026+0 2872+0 5974+0 1059+1 1691+1 3475+1
 9025-4 1030+0 2881+0 5990+0 1061+1 1694+1 3485+1
 1000-3 1031+0 2884+0 5996+0 1062+1 1696+1 3489+1
```

← Head above 749.5

← Flow

Basin 5
Steel Bridge Berm OT

Elev	H	Q
749.5	0	0
749.6	0.1	3.1
749.7	0.2	17.6
749.8	0.3	49
750.0	0.5	178
750.2	0.7	417
750.5	1.0	1031
751.0	1.5	2884
751.5	2.0	5996

COMBINED RATING CURVES FOR BASIN 6 & 7 ROUTINGS

The storage volume for the ponding areas adjacent to the canal in Basin 6, and Basin 7 (upstream of Ski lake — on either side of Woods Road) was combined to simulate a level pool routing through these reservoirs.

This approach was used because the initial HEC-1 run with individual routings for each of the three ponding areas above indicated significant interaction between the ponds.

The planimetered areas for the 3 ponds were added to obtain the cumulative ponding areas for the computation of storage volumes in these areas.

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT _____ DATE _____

PROJECT _____ BY _____ CHKD _____

PROJECT NO. _____ PAGE NO. 2/3

COMBINED STAGE - STORAGE CURVE

Elev	Area (Ac) Basin 6	Res. 12A	Res. 12B	Cum. Area	Δ Storage (Ac-ft)	Cum. Storage (Ac-ft)
742.2	0	0	0	0		0
					1.9	
744.0	1.0	1.1	0	2.1		1.9
					11.6	
746.0	1.6	3.7	4.2	9.5		13.5
					45.4	
748.0	9.2	12.6	14.1	35.9		58.9
					122.2	
750.0	30.7	22.0	33.6	86.3		181.1
					220.5	
752.0	49.4	30.6	54.2	134.2		401.6
					300.8	
754.0	70.7	40.0	55.9	166.6		702.4

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FCDMC DATE 3-9-92

PROJECT Gila Bend BY EDL CHKD

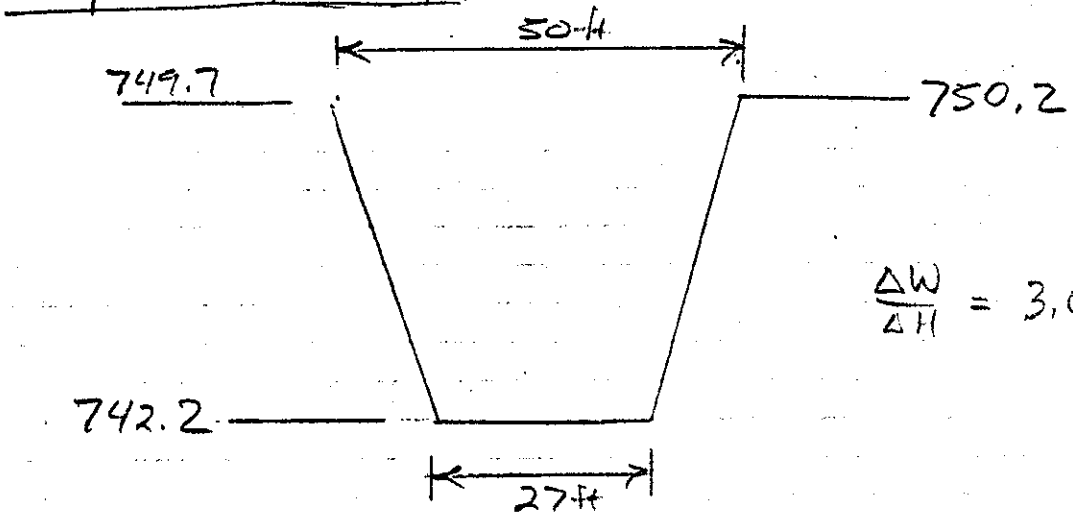
PROJECT NO. PAGE NO. 3/3

Revised

Combined Stage-Discharge Curve for basins 6/7 N. of Ski Lake

Elev	spillway #4	4 spillfos	(5003) Berm OT Basin 6	(5004) Berm OT at Woodsld	(5005) Berm OT at Ski Lk	Total Flow
742.2	0	0	0	0	0	0
743.0	80	0	0	0	0	80
744.0	278	0	0	0	0	278
745.0	560	0	0	0	0	560
746.2	995	8	0	0	0	1,003
747.3	1,483	38	0	0	0	1,521
748.0	1,844	57	0	0	0	1,901
749.0	2,411	70	0	8	149	2,638
750.0	3,058	86	771	206	5,021	9,142
750.5	3,414	90	2,104	444	9,741	15,793

Siphon Spillway #4



$\frac{\Delta W}{\Delta H} = 3.07$

Elev	H	d	Ave $\bar{W}$	$Q = 4\bar{W}H^{3/2}$
742.2	0	0	27.	0
743.0	0.8	0.53	27.8	79.6
744.0	1.8	1.2	28.8	278
745.0	2.8	1.9	29.9	560
746.2	4.0	2.7	31.1	995
747.3	5.1	3.4	32.2	1483
748.0	5.8	3.9	33.0	1844
748.55	6.35	4.2	33.4	2138
749.1	6.9	4.6	34.1	2472
749.8	7.6	5.1	34.8	2916
751.	8.8	5.9	36.1	3769

FEQUTL
INPUT FILE

```
STDIN=       5
STDOUT=      6
STDTAB=      7
UNITS=  ENGLISH
[illegible]D=       16
FEQX         1
FLOODWAY     2
BRIDGE       3
CULVERT      4
FINISH       5
SAME         6
FEQXLST      8
ROADWAY      9
SEWER       10
MULPIPES    11
FTABIN      12
EMBANKQ     13
JUMP        14
CRITQ       15
GRITTER     16
MULCON      18
DZLIM= 1.0
NRZERO= 0.08
USGSBETA=NO
EPSARG= .0005
EPSF=   .001
EXTEND=YES

FTABIN
[illegible]LE#=  -15WEIRTABS
TABLE#= -1


EMBANKQ
TABLE#= 5003 13
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
LABEL= BERM OVERTOPPING IN BASIN 6 JUST NORTH OF 6/7 DIVIDE
* USED TO CONSTRUCT HEC-1 STAGE DISCHARGE
  OFFSET  CREST ELEV  WIDTH    APPROACH  SURFACE
 -2112.     750.5      15.     748.00    PAVED
  -528.     750.0      15.
     0.     749.8      15.
   396.     750.2      15.
  1250.     750.4      15.     748.00    END
UPSTREAM HEADS TO USE IN COMPUTING THE TABLE
0.1
0.2
0.7
1.0
[illegible]0

EMBANKQ
TABLE#= 5004 13
PLCWTB=9994
GLCWTB=9995
```

FEQUTL
INPUT

```
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
LABEL= BERM OVERTOPPING IN BASIN 7 AT WOODS ROAD
* USED TO CONSTRUCT HEC-1 STAGE DISCHARGE
  OFFSET   CREST ELEV  WIDTH    APPROACH  SURFACE
   -70.      750.3      15.     748.00    PAVED
     0.      748.6      15.
    40.      750.1      15.     748.00    END
UPSTREAM HEADS TO USE IN COMPUTING THE TABLE
0.1
0.4
1.4
1.9
2.4
-1.0

EMBANKQ
TABLE#= 5005 13
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
LABEL= BERM OVERTOPPING IN BASIN 7 IMMEDIATELY N. OF SKI LAKE
* USED TO CONSTRUCT HEC-1 STAGE DISCHARGE
  OFFSET   CREST ELEV  WIDTH    APPROACH  SURFACE
  -900.      750.0      15.     742.00    PAVED
     0.      748.7      15.
  1100.      749.3      15.     742.00    END
UPSTREAM HEADS TO USE IN COMPUTING THE TABLE
0.3
0.8
1.0
1.3
1.8
-1.0

FINISH
```

OUTPUT

```
TABLE#= 5003
TYPE=  -13
LABEL= BERM OVERTOPPING IN BASIN 6 JUST NORTH OF 6/7 DIV
NUP=     4
NFD=    20
HUP      1000-4 2000-4 7000-4 1000-3 ← Head above 749.8
FDROP    1999-5 3977-5 1335-4 1846-4
   PFD            Flows for HUP and Proportion of FDROP
 2500-6 4041-4 2325-3 5100-2 1216-1
 1000-5 1212-3 8148-3 2265-1 4635-1
 2250-5 2831-3 1750-2 5083-1 1083+0
 4000-5 5261-3 3041-2 8417-1 1995+0
 6250-5 6846-3 4009-2 1179+0 2890+0
 9000-5 8320-3 4844-2 1371+0 3305+0
 1225-4 9338-3 5384-2 1510+0 3657+0
 1600-4 1017-2 5866-2 1640+0 4001+0
 2025-4 1097-2 6320-2 1747+0 4274+0
 2500-4 1155-2 6648-2 1839+0 4523+0
 3025-4 1206-2 6942-2 1911+0 4717+0
 3600-4 1244-2 7161-2 1968+0 4869+0
 4225-4 1274-2 7336-2 2008+0 4984+0
 4900-4 1296-2 7462-2 2039+0 5073+0
 5625-4 1309-2 7535-2 2062+0 5137+0
 6400-4 1319-2 7592-2 2081+0 5176+0
 7225-4 1327-2 7637-2 2093+0 5205+0
 8100-4 1333-2 7670-2 2100+0 5224+0
 9025-4 1338-2 7699-2 2103+0 5232+0
 1000-3 1339-2 7708-2 2104+0 5234+0 ← Flow
                750   750.5
```

OUTPU

TABLE#= 5004
TYPE= -13
LABEL= BERM OVERTOPPING IN BASIN 7 AT WOODS ROAD
NHUP= 5
NFD= 20

HUP	1000-4	4000-4	1400-3	1900-3	2400-3 ← Head above 748.6
FDROP	1980-5	7224-5	1778-4	2055-4	2189-4

PFD	Flows for HUP and Proportion of FDROP				
2500-6	7558-6	1880-4	6169-2	1431-1	2294-1
1000-5	2272-5	7670-4	7105-2	1584-1	2485-1
2250-5	5324-5	1791-3	8643-2	1857-1	2846-1
4000-5	9942-5	3315-3	1130-1	2347-1	4043-1
6250-5	1294-4	4747-3	1371-1	3017-1	5206-1
9000-5	1571-4	5406-3	1465-1	3182-1	5472-1
1225-4	1756-4	5958-3	1581-1	3381-1	5803-1
1600-4	1913-4	6519-3	1670-1	3562-1	6086-1
2025-4	2060-4	6950-3	1754-1	3721-1	6341-1
2500-4	2164-4	7332-3	1826-1	3865-1	6590-1
3025-4	2259-4	7614-3	1880-1	3995-1	6787-1
3600-4	2331-4	7859-3	1928-1	4088-1	6977-1
4225-4	2388-4	8029-3	1966-1	4175-1	7106-1
4900-4	2429-4	8169-3	1997-1	4242-1	7232-1
5625-4	2452-4	8254-3	2019-1	4297-1	7335-1
6400-4	2471-4	8305-3	2039-1	4345-1	7425-1
7225-4	2485-4	8346-3	2051-1	4382-1	7502-1
8100-4	2496-4	8381-3	2058-1	4417-1	7558-1
9025-4	2505-4	8409-3	2061-1	4431-1	7603-1
1000-3	2508-4	8419-3	2063-1	4436-1	7672-1 ← Flow
		749	750	750.5	

TABLE#= 5005
TYPE= -13
LABEL= BERM OVERTOPPING IN BASIN 7 IMMEDIATELY N. OF SKI
NUP= 5
NFD= 20

HUP	3000-4	8000-4	1000-3	1300-3	1800-3	← Head Above 748.7
FDROP	5995-5	1590-4	1981-4	2560-4	3506-4	

PFD	Flows for HUP and Proportion of FDROP					
2500-6	2990-3	4355-2	6262-2	1014-1	1866-1	
1000-5	1496-2	1620-1	2511-1	4276-1	7651-1	
2250-5	3292-2	3672-1	5751-1	9634-1	1753+0	
4000-5	5838-2	6357-1	1022+0	1739+0	3143+0	
6250-5	7662-2	8925-1	1450+0	2513+0	4825+0	
9000-5	9279-2	1057+0	1737+0	3037+0	5812+0	
1225-4	1036-1	1183+0	1936+0	3367+0	6431+0	
1600-4	1131-1	1287+0	2115+0	3693+0	7051+0	
2025-4	1218-1	1387+0	2283+0	3979+0	7599+0	
2500-4	1282-1	1467+0	2414+0	4221+0	8097+0	
3025-4	1338-1	1533+0	2532+0	4436+0	8500+0	
3600-4	1380-1	1584+0	2620+0	4593+0	8834+0	
4225-4	1415-1	1625+0	2692+0	4723+0	9102+0	
4900-4	1439-1	1656+0	2745+0	4824+0	9310+0	
5625-4	1452-1	1678+0	2781+0	4893+0	9467+0	
6400-4	1464-1	1692+0	2810+0	4945+0	9581+0	
7225-4	1473-1	1700+0	2826+0	4984+0	9659+0	
8100-4	1479-1	1706+0	2836+0	5003+0	9708+0	
9025-4	1485-1	1711+0	2844+0	5017+0	9734+0	
1000-3	1486-1	1713+0	2847+0	5021+0	9741+0	← Flow
	749			750	750.5	

EMBANKQ INPUT

```
STDIN=       5
STDOUT=      6
STDTAB=      7
UNITS=  ENGLISH
[illegible]D=      16
[illegible]QX        1
FLOODWAY     2
BRIDGE       3
CULVERT      4
FINISH       5
SAME         6
FEQXLST      8
ROADWAY      9
SEWER       10
MULPIPES    11
FTABIN      12
EMBANKQ     13
JUMP        14
CRITQ       15
GRITTER     16
MULCON      18
DZLIM= 1.0
NRZERO= 0.08
USGSBETA=NO
EPSARG= .0005
EPSF=   .001
EXTEND=YES

FTABIN
TABLE#=  -15WEIRTABS
[illegible]LE#= -1


EMBANKQ
TABLE#=  250
PLCWTB=9994
GLCWTB=9995
PHCWTB=9996
GHCWTB=9997
PSUBTB=9998
GSUBTB=9999
LABEL= BERM OVERTOPPING IN BASIN 7 SOUTH OF SKI LAKE
  OFFSET  CREST ELEV  WIDTH    APPROACH  SURFACE
     -136.     748.6       15.       744. PAVED
        0.     748.4       15.       744. PAVED
      238.     748.6       15.       744. PAVED
      264.     749.0       15.            END
UPSTREAM HEADS TO USE IN COMPUTING THE TABLE
0.1
0.6
1.1
1.6
2.1
2.6
3.6
-1.0

[illegible]NISH
```

OUTPUT

TABLE#= 250
TYPE= -13
LABEL= BERM OVERTOPPING IN BASIN 7 SOUTH OF SKI LAKE
NHUP= 7
NFD= 20

HUP	1000-4	6000-4	1100-3	1600-3	2100-3	2600-3	3600-3
FDROP	2001-5	1190-4	2149-4	3066-4	3937-4	4755-4	6251-4

PFD	Flows for HUP and Proportion of FDROP						
2500-6	2082-4	7907-3	2066-2	3680-2	5255-2	7042-2	1155-1
1000-5	6246-4	3171-2	8092-2	1435-1	2145-1	2972-1	4719-1
2250-5	1458-3	7004-2	1850-1	3323-1	5045-1	7022-1	1155+0
4000-5	2707-3	1242-1	3365-1	6137-1	9546-1	1373+0	2468+0
6250-5	3523-3	1926-1	5363-1	1012+0	1652+0	2478+0	4662+0
9000-5	4349-3	2388-1	6848-1	1281+0	2010+0	2891+0	5079+0
1225-4	4808-3	2641-1	7519-1	1402+0	2202+0	3168+0	5591+0
1600-4	5238-3	2906-1	8273-1	1543+0	2425+0	3494+0	6079+0
2025-4	5647-3	3139-1	8945-1	1664+0	2604+0	3730+0	6496+0
2500-4	5949-3	3358-1	9568-1	1781+0	2787+0	3993+0	6893+0
3025-4	6212-3	3535-1	1010+0	1878+0	2932+0	4185+0	7221+0
3600-4	6406-3	3684-1	1058+0	1968+0	3069+0	4371+0	7487+0
4225-4	6570-3	3805-1	1092+0	2030+0	3163+0	4503+0	7712+0
4900-4	6680-3	3899-1	1121+0	2084+0	3246+0	4615+0	7878+0
5625-4	6742-3	3970-1	1144+0	2129+0	3315+0	4711+0	8028+0
6400-4	6795-3	4024-1	1162+0	2163+0	3367+0	4784+0	8150+0
7225-4	6836-3	4065-1	1175+0	2187+0	3406+0	4837+0	8233+0
8100-4	6866-3	4089-1	1186+0	2208+0	3438+0	4884+0	8310+0
9025-4	6891-3	4099-1	1191+0	2220+0	3458+0	4914+0	8364+0
1000-3	6900-3	4101-1	1192+0	2222+0	3464+0	4923+0	8382+0

EXPLANATION OF THE FEQUTL PROGRAM

The FEQUTL computer program was used to compute rating curves for berm overtopping, culvert flow, and for control section K. FEQUTL is a Fortran program containing 15 commands (routines) for hydraulic analysis. It is designed to produce rating curves in the format required for the FEQ unsteady flow hydraulic model but the results are usable in any modeling strategy.

FEQ and FEQUTL are products of Dr. Delbert Franz of Linsley-Kraeger Associates, Ltd., Mountain View, California, who distribute the model at no cost but technical support is available only through contractors. FEQ was not used in the derivation of floodplains for the Gila Bend Canal FIS, only the utility program, FEQUTL.

The commands used in the Gila Bend hydraulic analysis were the following:

FEQX - Computes cross-section elements (area, top width, critical flow conveyance, etc.) as a function of depth.

MULCON - Computes cross-section elements for one or more closed conduits.

CULVERT - Computes rating curves for flow in closed conduits according to the USGS methods specified in "Measurement of Discharge in Culverts by Indirect Methods". The method accounts for entrance and exit conditions as well as the flow profile in the culvert barrel(s).

EMBANKQ - Computes rating curves for flow over embankments according to USGS methods specified in "Measurement of Discharge Over Small Dams by Indirect Methods".

CHANRAT - Computes the rating curve for a channel reach of specified length, cross-section, and slope.

The FEQX and MULCON commands were used to provide required inputs to CULVERT, EMBANKQ, AND CHANRAT. The rating curve commands produce two-dimensional tables; that is, flow is computed for many combinations of upstream and downstream water surface elevation. FEQUTL usually indicates the tailwater elevation at which backwater effects begin. The headwater to tailwater distance at this instant is called the free drop and the flow rate is called the free flow. The free flow condition rating curves were employed in the Gila Bend hydraulic analysis except when CHANRAT was used. For the CHANRAT analysis of control section K, a normal depth rating curve was selected for use in HEC-1.

51M/GI/AI3

DIVERSION FLOW CURVES
FLOW SPLIT IN
BASIN 8

Computation of Diversion Curves for Flow Splits in Basin 8

Gila Bend Canal Study
11-13-91

Elevation (feet)	(1) (2+3) Inflow from Basin 8 (cfs)	(2) (Col. 5) Diversion to to South (cfs)	(3) (4+6) Diversion to North (cfs)	(4) Computed Rating Curves Pump Stn Spillway (cfs)	(5) Capacity of Section H3 (cfs)	(6) Capacity of Section K (cfs)
743.0	11	0	11	10	0	1
744.0	73	0	73	54	0	19
745.0	210	0	210	129	0	81
746.0	425	7	418	239	7	179
747.0	899	200	699	385	200	314
748.0	1,392	336	1,056	570	336	486
749.0	1,951	484	1,467	796	484	671
750.0	2,665	645	2,020	1,067	645	953
751.0	3,367	807	2,560	1,384	807	1176
752.0	4,288	1,030	3,258	1,749	1030	1509
753.0	5,666	1,350	4,316	2,166	1350	2150
754.0	7,380	1,867	5,513	2,635	1867	2878

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	9.000	200.00	746.99	.00	.38	.00	60.37	605.00
*	9.000	400.00	748.47	1.48	-.02	.00	112.90	605.00
*	9.000	800.00	750.97	2.50	.00	.00	141.31	605.00
*	9.000	1200.00	752.76	1.78	.00	.00	158.33	605.00
*	9.000	1600.00	753.40	.65	.00	.00	164.51	605.00
*	9.000	2000.00	754.30	.90	-.01	.00	173.14	605.00
*	9.000	2400.00	755.24	.94	-.01	.00	182.09	605.00
*	9.000	2800.00	755.81	.57	-.01	.00	187.56	605.00

HEC-2 model analysis used to develop a HEC-1 rating curve at the upstream end of the routing reach (mile 155.58) CONTROL SECTION H3

CHANRAT INPUT
FOR CONTROL
SECTION K

```
STDIN=       5
STDOUT=      6
STDTAB=      7
UNITS=  ENGLISH
NCMD=       17
FEQX         1
FLOODWAY     2
BRIDGE       3
CULVERT      4
FINISH       5
SAME         6
FEQXLST      8
ROADWAY      9
SEWER       10
MULPIPES    11
FTABIN      12
EMBANKQ     13
JUMP        14
CRITQ       15
GRITTER     16
MULCON      18
CHANRAT     19
DZLIM= 1.0
NRZERO= 0.08
USGSBETA=NO
EPSARG= 0.0005
EPSF=  0.001
EXTEND=YES


FEQX
TABLE#= 9213   SAVE12 NEWBETA NOOUT
STATION=60705
NAVM=      SCALE=            SHIFT=
NSUB  2     0.04       0.001
CONTROL SECTION K
    -54.        752.0     1
    -20.        750.0     1
    -11.        744.0
      0.        742.6
     10.        744.0
     20.        748.0
     30.        749.4     2
    30.1        760.0    -1

CHANRAT
TABLE#=8213
TYPE=13
LABEL=FLOW THROUGH CONTROL SECTION K
XSTAB#= 9213
BOTSLP= 0.002
LENGTH= 500.0
HEAD SEQUENCE DEFINITION
NFRAC=11
POWER=2.5
0.40
1.4
2.4
3.4
4.4
5.4
6.4
7.4
8.4
9.4
10.4
11.4
-1

FINISH
```

Section K
11-12-91
CHANRAT OUTPUT
FOR NORMAL DEPTH
FLOW

0Upstream Head=	0.400	Free Drop=	1.150	Normal Flow=	0.891
0Upstream Head=	1.400	Free Drop=	1.545	Normal Flow=	19.192
0Upstream Head=	2.400	Free Drop=	1.861	Normal Flow=	80.922
0Upstream Head=	3.400	Free Drop=	2.255	Normal Flow=	179.103
0Upstream Head=	4.400	Free Drop=	2.600	Normal Flow=	313.713
0Upstream Head=	5.400	Free Drop=	2.903	Normal Flow=	486.197
0Upstream Head=	6.400	Free Drop=	3.220	Normal Flow=	670.995
0Upstream Head=	7.400	Free Drop=	3.453	Normal Flow=	953.160
0Upstream Head=	8.400	Free Drop=	3.706	Normal Flow=	1175.698
0Upstream Head=	9.400	Free Drop=	3.905	Normal Flow=	1508.905
0Upstream Head=	10.400	Free Drop=	3.885	Normal Flow=	2149.538
0Upstream Head=	11.400	Free Drop=	3.618	Normal Flow=	2878.294

APPENDIX B

PONDING AREA STAGE-STORAGE-AREA RELATIONS

STAGE – STORAGE RELATION
PONDING AREA # 1
BASIN 18

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
730.7	0	0.4
734	0.5	0.7
736	1.8	1.5
738	8.1	8.3
740	40.4	25.0
742	106.4	43.2
744	214.9	62.8
746	358.4	80.3
748	530.2	90.7
750	726.7	97.0

STAGE – STORAGE RELATION
PONDING AREA # 2
BASIN 17

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
738	0	0
740	0.8	3.2
742	15.6	18.8
744	78.1	44.6
746	186.2	64.9
748	329.4	73.6
750	488.5	85.5

STAGE – STORAGE RELATION
PONDING AREA # 3
BASIN 16

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
735	0	0.6
736	0.7	0.8
738	2.8	1.3
740	13.8	9.7
742	40.3	16.8
744	98.4	41.3
746	208.6	68.9
748	372.5	95.0
750	593.0	125.5

STAGE – STORAGE RELATION
PONDING AREA # 4
BASIN 15

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
738	0	2.1
739	2.3	2.5
740	5.0	3.0
742	30.8	22.8
744	87.1	33.5
746	210.4	89.8
748	424.7	124.5
750	702.4	153.1

STAGE – STORAGE RELATION
PONDING AREA # 5
BASIN 14

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
740	1.3	1.0
742	10.8	8.6
744	36.7	14.8
746	69.9	43.0
748	202.4	67.8
750	340.3	70.2

STAGE – STORAGE RELATION
PONDING AREA # 6
BASIN 13

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
739	0	0
740	0.1	0.1
742	0.4	0.2
744	6.0	5.4
746	26.3	14.9
748	64.8	23.6
750	125.5	37.0

STAGE – STORAGE RELATION
PONDING AREA # 7
BASIN 12

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
738	0	0.1
739	0.2	0.2
740	0.5	0.6
742	4.9	3.8
744	21.1	12.4
746	76.9	43.4
748	199.2	78.9
750	389.6	111.8

STAGE – STORAGE RELATION
PONDING AREA # 8
BASIN 11

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
734	0	0
735	0.1	0.2
736	0.3	0.4
738	2.4	2.1
740	9.8	5.3
742	32.5	17.6
744	81.0	30.9
746	167.5	55.6
748	300.8	77.7
750	495.5	117.0

STAGE – STORAGE RELATION
PONDING AREA # 9
BASIN 10

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
738	0	0.7
739	0.8	0.9
740	1.8	1.1
742	5.1	2.3
744	10.0	2.6
746	21.1	8.5
748	49.4	19.8
750	96.8	27.6
752	161.4	37.0

STAGE – STORAGE RELATION
PONDING AREA # 10
BASIN 9 (SOUTH)

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
738	0	3.0
739	3.4	3.8
740	7.6	4.6
742	28.1	15.9
744	64.6	20.6
746	128.3	43.2
748	220.0	48.6
750	326.5	58.0
752	458.4	73.9

STAGE – STORAGE RELATION
PONDING AREA # 11
BASIN 9 (NORTH)

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
740	0	0.7
742	16.6	15.7
744	55.5	23.1
746	107.5	28.9
748	166.9	30.4
750	232.3	34.9
752	305.3	38.0
754	385.3	42

STAGE – STORAGE RELATION
PONDING AREA # 12–A
BASIN 7

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
744	0	1.1
746	4.8	3.7
748	21.0	12.6
750	55.6	22.0
752	108.2	30.6
754	178.8	40.0

STAGE – STORAGE RELATION
PONDING AREA # 12–B
BASIN 7

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
746	0	4.2
748	18.3	14.1
750	66.0	33.6
752	153.8	54.2
754	263.8	55.9

STAGE – STORAGE RELATION
PONDING AREA # 12–C
BASIN 7 (SOUTH OF SKILAKE)

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
742	0	0
744	1.0	1.0
746	4.0	5.9
748	12.8	22.6
750	19.1	54.6
752	25.7	99.4

STAGE – STORAGE RELATION
PONDING AREA # 13
BASIN 6

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
742.18	0	0
746	3.0	1.6
748	13.8	9.2
750	53.7	30.7
752	133.8	49.4
754	253.9	70.7

STAGE – STORAGE RELATION
PONDING AREA # 14
BASIN 5 (SOUTH)

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
746	0	0.5
747	0.9	1.3
748	2.6	2.0
750	24.9	20.3
752	108.1	62.8
754	185.3	91.6

STAGE – STORAGE RELATION
PONDING AREA # 15
BASIN 5 (NORTH)

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
748	0.7	0
750	79.0	79.7
752	163.3	321.9

STAGE – STORAGE RELATION
PONDING AREA # 16
BASIN 3

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
744.80	0	0
746	0.5	0.3
747	1.3	1.2
748	2.0	2.9
750	20.4	25.2
752	62.8	108.4
753	91.6	185.6

STAGE – STORAGE RELATION
PONDING AREA # 17
BASIN 2

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
740.64	0	0
744	0.9	1.4
746	3.7	6.0
748	7.6	17.4
750	14.1	39.1
752	34.8	125.6
754	85.3	245.7

STAGE – STORAGE RELATION
PONDING AREA # 18
BASIN 1

ELEVATION (FT)	STORAGE (AC–FT)	AREA (ACRES)
740.64	0	0
744	0.04	0.02
746	0.3	0.2
748	0.9	0.3
750	8.7	7.5
752	60.0	43.7
754	198.1	94.3

APPENDIX C

HEC-1 MODEL INPUT AND OUTPUT

- RP.HC1 (Basins 1-7)
- SKILKS.HC1 (Basins 7-10)
- BFD.HC1 (Basins 11-15)
- GTZ.HC1 (Basins 16-18)

HEC1 S/N: HMVersion: 6.00 Data File: RPNEW.HC1

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  03/09/1992  TIME  09:22:28 *
*                                      *
****************************************
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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
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::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
:::                                  :::
:::  Full Microcomputer Implementation :::
:::                by                :::
:::       Haestad Methods, Inc.      :::
:::                                  :::
::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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            PROJECT: GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
  2           ID            CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  3           ID            DONOHUE PROJECT NO: 18099
  4           ID            DATE: 03/8/92
  5           ID            FILENAME: RPNEW.HC1        BASINS 1 - 10
  6           ID            RUN DESCRIPTION:
  7           ID                STORM EVENT: 100-YR
  8           ID                STORM DURATION: 24-HR
  9           ID                COMBINED RATING CURVES FOR FLOW OVER SPILLWAYS, CANAL BERM,
 10           ID                LOW LEVEL OUTLETS (SPILL-TOs, SPILL-UNDERS etc.), AND CONTROL-
 11           ID                SECTIONS (OVERFLOW TO NEXT DOWNSTREAM BASIN), WERE USED FOR THE
 12           ID                ROUTINGS THROUGH PONDING AREAS ADJACENT TO THE CANAL.
 13           ID                RAINBOW & PALOMA HEC-1 MODELS WERE COMBINED TO BETTER MODEL THE
 14           ID                PONDING AREAS IN BASINS 6 AND 7.
 15           IT      10                    145
 16           IO       5
              *DIAGRAM
 17           IN      30
 18           JD    4.20     .01
 19           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 20           PC    .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
 21           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 22           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 23           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 24           JD    3.99    10.0
 25           JD    3.86    20.0
 26           JD    3.78    30.0
 27           JD    3.70    50.0
 28           JD    3.57   100.0
              *  BASIN NO. 1

 29           KK     101
 30           KM            SUB-BASIN 101
 31           BA     .87
 32           LG     .20     .26    7.40     .15    7.00
 33           UI     81.    304.    459.    753.    702.    476.    300.    133.     82.     30.
 34           UI     22.     22.      0.      0.      0.      0.      0.      0.      0.      0.
 35           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 36           KK     1R1
 37           RS       3    FLOW      -1
 38           RL                      1     742
 39           RC    0.05    0.05    0.05    8000   .0011   760.0
 40           RX       0     600     630     640     670     680     690     700
 41           RY     760     750     746   742.1     742     746     750     750

 42           KK     102
 43           KM            SUB-BASIN 102
 44           BA     .92
 45           LG     .32     .34    4.70     .55     .00
 46           UI    196.    599.   1107.    881.    484.    173.     69.     33.      0.      0.
 47           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
              *  BASIN NO. 2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 48           KK     201
 49           KM            SUB-BASIN 201
 50           BA    2.90
 51           LG     .25     .23    8.40     .08   12.00
 52           UI    233.    932.   1397.   2170.   2469.   1666.   1134.    545.    319.    166.
 53           UI     70.     70.      0.      0.      0.      0.      0.      0.      0.      0.
 54           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 55           KK    2R1A
 56           RS       3    FLOW      -1
 57           RL                      5     100
 58           RC     .05     .05     .05   10060   .0144     105
 59           RX       0     100    2268    2851    3434    4017    6186    6285
 60           RY     106     104     102     100     100     102     104     106

 61           KK    2R1B
 62           RS       3    FLOW      -1
 63           RL                      5     742
 64           RC    0.05    0.05    0.05    3000   .0011   760.0
 65           RX       0     600     630     640     670     680     690     700
 66           RY     760     750     746   742.1     742     746     750     750

 67           KK     202
 68           KM            SUB-BASIN 202
 69           BA    2.62
 70           LG     .30     .33    4.20     .35     .00
 71           UI    108.    142.    396.    533.    635.    768.    971.   1350.   1146.    925.
 72           UI    772.    630.    513.    354.    199.    179.    125.    108.     42.     33.
 73           UI     33.     33.     33.     33.      0.      0.      0.      0.      0.      0.
 74           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 75           KK     1C1
 76           KM            SIPHON 1 - GILLESPIE
 77           HC       4

 78           KK   SPLWY1
 79           KM            ROUTE BASINS 1&2 TO COMB. RESERV.(17 & 18) AND THRU SPLWY @ SIPHON 1
 80           KO       3
              *    FLOW OVER CONTROL SECTION NOT INCLUDED IN THE RATING CURVE BECAUSE OF
              *    BACKWATER FROM BASIN 3
 81           RS       1    ELEV  740.64
 82           SV       0     1.5     6.3    18.2    30.3   130.6   388.6
 83           SE  740.64     744     746     748     750     752     754
 84           SQ       0      49     125     237     571    1062    1274    1496    1741    2619
 85           SE  740.64   742.0   743.0   744.0   746.0   748.0  748.67  749.33   750.0   752.0
              *  BASIN NO. 3

 86           KK     300
 87           KM            RUSSEL BADLEY
 88           BA    3.78
 89           LG     .28     .31    4.70     .33    6.00
 90           UI    179.    330.    740.    968.   1184.   1512.   2188.   1877.   1488.   1193.
 91           UI    948.    691.    382.    300.    207.    164.     55.     55.     55.     55.
 92           UI     55.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 93           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 94           KK  SPLWY2
 95           KM            ROUTE BASIN 3 TO RESERVOIR 16 AND THROUGH SPILLWAY @ SIPHON 2
 96           RS       1    ELEV   744.8
 97           SV       0    0.32    1.23    2.87   25.23  108.39  185.59
 98           SE   744.8     746     747     748     750     752     753
 99           SQ       0       8     126     322     579    1278    1966    2264    2555    6325
100           SE   744.8   745.0   746.0   747.0   748.0   750.0   751.5   751.7   751.8   752.5

101           KK     ADD
102           KM        ADD OUTFLOW FROM SPILLWAYS 1 & 2.
103           HC       2
              *  BASIN NO. 4

104           KK     401
105           KM            SUB-BASIN 401
106           BA    2.87
107           LG     .19     .32    4.50     .28    1.00
108           UI    122.    173.    459.    613.    733.    891.   1182.   1523.   1229.   1007.
109           UI    825.    671.    534.    323.    212.    189.    122.     94.     38.     38.
110           UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
111           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

112           KK     4R1
113           RS       3    FLOW      -1       0
114           RL                     10     990
115           RC     .05     .05     .05    8045   .0050    1010
116           RX       0    1000    1500    1501    1600    1601    2601    4101
117           RY    1010    1000     995     990     990     995    1000    1010

118           KK     402
119           KM            SUB-BASIN 402
120           BA    2.04
121           LG     .16     .30    4.10     .27    1.00
122           UI     88.    130.    334.    446.    533.    650.    877.   1092.    862.    710.
123           UI    577.    468.    362.    208.    151.    125.     88.     54.     27.     27.
124           UI     27.     27.     27.      0.      0.      0.      0.      0.      0.      0.
125           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

126           KK     403
127           KM            SUB-BASIN 403
128           BA    5.09
129           LG     .29     .33    4.60     .32    2.00
130           UI    206.    249.    738.   1005.   1193.   1428.   1767.   2497.   2318.   1842.
131           UI   1552.   1274.   1039.    780.    459.    352.    293.    206.    143.     63.
132           UI     63.     63.     63.     63.      0.      0.      0.      0.      0.      0.
133           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

134           KK     4C1
135           HC       3
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 136          KK     4R2
 137          RS       6    FLOW      -1       0
 138          RL                     10     960
 139          RC     .05     .05     .05   15840   .0051    1000
 140          RX       0     200     500     501     651     652    2452    4452
 141          RY     990     970     965     960     960     965     980     990

 142          KK     407
 143          KM            SUB-BASIN 407
 144          BA    6.93
 145          LG     .25     .33    4.90     .32    2.00
 146          UI    281.    340.   1005.   1369.   1624.   1945.   2405.   3400.   3156.   2508.
 147          UI   2113.   1734.   1414.   1062.    624.    479.    399.    281.    195.     86.
 148          UI    86.     86.     86.     86.      0.      0.      0.      0.      0.      0.
 149          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 150          KK     4C2
 151          HC       2

 152          KK     4R3
 153          RS       1    FLOW      -1
 154          RL                     10   891.5
 155          RC     .05     .05     .05    2514   .0040     898
 156          RX       0      25     185     205     235     255     525     560
 157          RY     896   895.2   893.5   891.6   891.5   896.5   895.8     898

 158          KK     404
 159          KM            SUB-BASIN 404
 160          BA    3.87
 161          LG     .18     .31    4.00     .29     .00
 162          UI    140.    140.    432.    615.    746.    865.   1027.   1269.   1738.   1579.
 163          UI   1281.   1100.    920.    775.    643.    457.    270.    236.    199.    140.
 164          UI    120.     43.     43.     43.     43.     43.     43.      0.      0.      0.
 165          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 166          KK     405
 167          KM            SUB-BASIN 405
 168          BA     .53
 169          LG     .30     .30    3.90     .27     .00
 170          UI     36.    126.    201.    275.    429.    340.    248.    175.     89.     56.
 171          UI     35.     11.     11.     11.      0.      0.      0.      0.      0.      0.
 172          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 173          KK     4C7
 174          HC       2

 175          KK     4R4
 176          RS       1    FLOW      -1
 177          RL                     10   890.5
 178          RC     .05     .05     .05    4022   .0050     900
 179          RX       0     220     590     605     625     645     780    1000
 180          RY     900   894.5     894   890.5   890.5   894.5   894.5     900
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 181          KK     406
 182          KM            SUB-BASIN 406
 183          BA    1.83
 184          LG     .28     .30    5.50     .27    6.00
 185          UI    134.    508.    776.   1117.   1580.   1116.    789.    502.    230.    154.
 186          UI     68.     41.     41.      0.      0.      0.      0.      0.      0.      0.
 187          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 188          KK     4C3
 189          HC       3

 190          KK     4R5
 191          RS       3    FLOW
 192          RL                     10   873.5
 193          RC     .05     .05     .05    8045   .0050     884
 194          RX       0      40     190     305     370     395     515     525
 195          RY     882     880     880   873.5     874   881.5     883     884

 196          KK     408
 197          KM            SUB-BASIN 408
 198          BA    6.47
 199          LG     .33     .31    5.40     .28    4.00
 200          UI    108.    108.    108.    108.    195.    354.    410.    474.    519.    565.
 201          UI    604.    646.    691.    752.    814.    875.   1003.   1211.   1318.   1401.
 202          UI   1230.   1100.   1007.    935.    873.    818.    748.    686.    639.    586.
 203          UI    538.    503.    433.    357.    310.    199.    191.    187.    177.    177.
 204          UI    144.    108.    108.    108.    108.     46.     33.     33.     33.     33.
 205          UI     33.     33.     33.     33.     33.     33.     33.     33.     33.     33.
 206          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 207          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 208          KK     4R6
 209          RS       1    FLOW     -1
 210          RL                     10     890
 211          RC     .05     .05     .05    3268   .0092     910
 212          RX       0    1000    2600    2610    2640    2650    4950    5950
 213          RY     910     900     895     890     890     895     900     910

 214          KK     409
 215          KM            SUB-BASIN 409
 216          BA    1.13
 217          LG     .25     .35    4.30     .43     .00
 218          UI    208.    650.   1178.   1156.    683.    281.    134.     38.     38.      0.
 219          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 220          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 221          KK     410
 222          KM            SUB-BASIN 410
 223          BA    2.92
 224          LG     .29     .28    5.10     .26    4.00
 225          UI    124.    177.    467.    624.    746.    907.   1202.   1549.   1251.   1025.
 226          UI    839.    683.    543.    328.    216.    192.    124.     95.     38.     38.
 227          UI     38.     38.     38.      0.      0.      0.      0.      0.      0.      0.
 228          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 229          KK     4C4
 230          HC       4

 231          KK     4R7
 232          RS       2    FLOW      -1       0
 233          RL                     10     820
 234          RC     .05     .05     .05    6537   .0041   826.9
 235          RX       0      15      30     212     258     268     289     378
 236          RY   825.3   824.8   822.9     820     820     825   825.9   826.9

 237          KK     411
 238          KM            SUB-BASIN 411
 239          BA    6.03
 240          LG     .33     .31    5.10     .29    4.00
 241          UI    207.    207.    567.    869.   1067.   1225.   1435.   1694.   2258.   2620.
 242          UI   2091.   1772.   1532.   1291.   1090.    905.    641.    369.    348.    295.
 243          UI    207.    195.     64.     64.     64.     64.     64.     64.     64.      0.
 244          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 245          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 246          KK     4R8
 247          RS       4                0       0
 248          RL                     10     100
 249          RC     .05     .05     .05   10308   .0102     110
 250          RX       0     100    3036    3355    3685    4014    6940    7040
 251          RY     106     104     102     100     100     102     104     106

 252          KK     412
 253          KM            SUB-BASIN 412
 254          BA    2.36
 255          LG     .32     .33    4.20     .38    1.00
 256          UI    142.    398.    716.    927.   1314.   1687.   1243.    945.    703.    401.
 257          UI    241.    163.     95.     44.     44.     44.      0.      0.      0.      0.
 258          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 259          KK     413
 260          KM            SUB-BASIN 413
 261          BA    1.24
 262          LG     .27     .33    4.00     .39     .00
 263          UI     53.     75.    198.    265.    317.    385.    511.    658.    531.    435.
 264          UI    356.    290.    231.    139.     92.     82.     53.     41.     16.     16.
 265          UI     16.     16.     16.      0.      0.      0.      0.      0.      0.      0.
 266          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 267          KK     4C5
 268          HC       4

 269          KK     4R9
 270          RS       4    FLOW      -1       0
 271          RL                     10     764
 272          RC     .05     .05     .05   12000   .0065     780
 273          RX       0      15      35      65     115     140     141     156
 274          RY     780     770   764.5     764     764   764.5   769.5     780
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

275         KK     414
276         KM            SUB-BASIN 414
277         BA    3.63
278         LG     .29     .28    6.20     .24    8.00
279         UI    108.    108.    207.    392.    504.    580.    651.    751.    859.   1103.
280         UI   1366.   1229.   1024.    899.    790.    681.    588.    512.    388.    265.
281         UI    191.    179.    155.    108.    108.     53.     33.     33.     33.     33.
282         UI     33.     33.     33.      0.      0.      0.      0.      0.      0.      0.
283         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

284         KK     415
285         KM            SUB-BASIN 415
286         BA    3.55
287         LG     .38     .35    4.30     .43     .00
288         UI    187.    420.    843.   1087.   1375.   1998.   2151.   1607.   1265.    979.
289         UI    675.    352.    287.    187.     97.     57.     57.     57.     57.      0.
290         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
291         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

292         KK     4C6
293         HC       3

294         KK  SPLWY3
295         KM            ROUTE BASIN 4 THROUGH SPILLWAY @ SIPHON3 (RAINBOW WASH)
296         RS       1    ELEV   737.6
297         SV       1       2       3       4       5       6       7       8       9      10
298         SE   737.6   738.9   739.9   740.9   741.9   742.9   743.9   744.9   746.9   748.9
299         SQ       0    2000    4000    6000    8000   10000   12000   14000   16000
300         SE   737.6   740.5   741.8   742.8   743.8   744.6   745.3   746.0   746.7
            *  BASIN NO.5

301         KK     500
302         KM            SPILL-UNDER @ TURNER DRAW
303         BA    3.17
304         LG     .44     .35    4.30     .62     .00
305         UI    213.    717.   1160.   1563.   2465.   2063.   1511.   1092.    594.    358.
306         UI    217.     92.     65.     65.      0.      0.      0.      0.      0.      0.
307         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

308         KK   RES14
309         KO       3
310         KM          ROUTE BASIN 5N AND 5S INTO RESERVOIR NO. 14
            *         PONDING IN RESERVOIR UNTIL BERM GETS OVERTOPPED AT 749.5 FT
311         RS       1    ELEV     744
312         SV       0    0.45    1.09   14.36   145.1
313         SE     744     745     746     748     750
314         SQ       0       3      18      49     178     417    1031    2884    5996
315         SE   749.5   749.6   749.7   749.8   750.0   750.2   750.5   751.0   751.5
            *  BASIN NO. 6
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 316          KK     601
 317          KM            SUB-BASIN 601
 318          BA    3.68
 319          LG     .50     .28    6.40     .21    7.00
 320          UI    180.    349.    762.    988.   1224.   1596.   2233.   1771.   1419.   1123.
 321          UI    885.    587.    315.    277.    180.    108.     55.     55.     55.     55.
 322          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 323          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 324          KK     6R1
 325          RS       2    FLOW
 326          RL                     10     100
 327          RC     .05     .05     .05    5280   .0100     110
 328          RX       0     100    1408    1475    1541    1608    2917    3017
 329          RY     106     104     102     100     100     102     104     106

 330          KK     602
 331          KM            SUB-BASIN 602
 332          BA     .44
 333          LG     .39     .35    4.00     .38     .00
 334          UI     87.    269.    496.    435.    251.     96.     40.     15.      0.      0.
 335          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 336          KK     6C1
 337          HC       2

 338          KK     6R2
 339          RS       2    FLOW
 340          RL                     10     820
 341          RC     .05     .05     .05    5280   .0023     840
 342          RX       0    1470    1500    1530    1580    1610    2410    3110
 343          RY     800     825     825     820     820     825     830     840

 344          KK     603
 345          KM            SUB-BASIN 603
 346          BA    2.28
 347          LG     .38     .32    4.70     .32    1.00
 348          UI    338.   1114.   1828.   2471.   1550.    859.    355.    164.     69.     69.
 349          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 350          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 351          KK     6R3
 352          RS       1    FLOW      -1
 353          RL                     10     840
 354          RC     .05     .05     .05    4700   .0148     860
 355          RX       0    1500    6700    6720    6770    6795    8195    9195
 356          RY     860     850     845     840     840     845     850     860

 357          KK     604
 358          KM            SUB-BASIN 604
 359          BA     .60
 360          LG     .50     .35    4.00     .55     .00
 361          UI     52.    201.    302.    485.    498.    337.    223.    100.     61.     28.
 362          UI     15.     15.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 363          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 364          KK     6C2
 365          HC       3

 366          KK     6R4
 367          RS       2   FLOW
 368          RL                      10     780
 369          RC     .05     .05     .05    6537   .0115     800
 370          RX       0    1500    5700    5750    5850    5900    7900    9400
 371          RY     800     790     785     780     780     785     790     800

 372          KK     605
 373          KM             SUB-BASIN 605
 374          BA    1.60
 375          LG     .44     .34    4.00     .38     .00
 376          UI     98.    283.    501.    652.    933.   1152.    833.    627.    456.    243.
 377          UI    164.    100.     50.     30.     30.     30.      0.      0.      0.      0.
 378          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 379          KK     6R5
 380          RS       1   FLOW      -1
 381          RL                      10     780
 382          RC     .05     .05     .05    4022   .0099     800
 383          RX       0    1500    5700    5730    5830    5860    7860    9360
 384          RY     800     790     785     780     780     785     790     800

 385          KK     606
 386          KM             SUB-BASIN 606
 387          BA    3.64
 388          LG     .29     .26    7.30     .15    9.00
 389          UI    223.    643.   1139.   1483.   2123.   2620.   1894.   1428.   1038.    552.
 390          UI    373.    228.    114.     68.     68.     68.      0.      0.      0.      0.
 391          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 392          KK     6R6
 393          RS       3   FLOW      -1
 394          RL                      10     100
 395          RC     .05     .05     .05    9051   .0122     110
 396          RX       0     100     250     317     383     450     600     700
 397          RY     106     104     102     100     100     102     104     106

 398          KK     607
 399          KM             SUB-BASIN 607
 400          BA    1.13
 401          LG     .46     .34    4.20     .58     .00
 402          UI     75.    244.    401.    536.    842.    753.    552.    400.    242.    127.
 403          UI     86.     44.     23.     23.     23.      0.      0.      0.      0.      0.
 404          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

405         KK     608
406         KM            SUB-BASIN 608
407         BA     .37
408         LG     .35     .31    3.90     .32     .00
409         UI     51.    171.    273.    400.    259.    154.     64.     32.     11.     11.
410         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
411         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

412         KK     6C3
413         HC       5
            *  BASIN NO. 7

414         KK     701
415         KM   SUB-BASIN 701
416         BA    6.40
417         LG     .31     .28    6.40     .21    7.00
418         UI    326.    690.   1436.   1862.   2327.   3226.   3956.   2959.   2363.   1841.
419         UI   1383.    743.    549.    377.    272.    100.    100.    100.    100.      0.
420         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
421         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

422         KK     7R1
423         RS       2    FLOW      -1
424         RL                      1     100
425         RC     .05     .05     .05    5531   .0108     105
426         RX       0     100    1259    1426    1592    1759    2917    3017
427         RY     106     104     102   100.1     100     102     104     106

428         KK     702
429         KM   SUB-BASIN 702
430         BA    4.32
431         LG     .33     .27    6.70     .21    9.00
432         UI    303.   1083.   1702.   2357.   3598.   2722.   1977.   1357.    646.    426.
433         UI    247.     93.     93.     93.      0.      0.      0.      0.      0.      0.
434         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

435         KK     7C1
436         HC       2

437         KK     7R2
438         RS       2    FLOW      -1
439         RL                      1     100
440         RC     .05     .05     .05    6034   .0066     105
441         RX       0     100     931    1064    1198    1331    2162    2262
442         RY     106     104     102   100.1     100     102     104     106

443         KK     703
444         KM   SUB-BASIN 703
445         BA    2.73
446         LG     .30     .26    7.40     .18   10.00
447         UI    118.    173.    447.    596.    713.    870.   1174.   1462.   1154.    950.
448         UI    773.    627.    485.    279.    202.    167.    118.     72.     36.     36.
449         UI     36.     36.     36.      0.      0.      0.      0.      0.      0.      0.
450         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 451          KK     CD1          COMBINE FLOW PRIOR TO DIVERSION
 452          HC       2

 453          KK      D1
 454          KM            DIVERT FLOWS FROM BASIN 7 TO BASIN 8
 455          DT    DIV1
 456          DI       0      36      66     200    1600    2400    5000    8900
 457          DQ       0       0       0      40     240     460    1000    1800

 458          KK     7R3
 459          RS       2    FLOW      -1
 460          RL                       1     100
 461          RC     .05     .05     .05    6537   .0153     105
 462          RX       0     100    1308    1441    1575    1708    2917    3017
 463          RY     106     104     102   100.1     100     102     104     106

 464          KK     704
 465          KM   SUB-BASIN 704
 466          BA    3.25
 467          LG     .28     .27    7.20     .20   12.00
 468          UI    249.    997.   1499.   2266.   2805.   1907.   1326.    688.    387.    221.
 469          UI     76.     76.     76.      0.      0.      0.      0.      0.      0.      0.
 470          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 471          KK     7C2
 472          HC       2

 473          KK     7R4
 474          RS       6    FLOW      -1
 475          RL                       1     100
 476          RC     .05     .05     .05   17600   .0153     105
 477          RX       0     100    1973    2501    3029    3557    5431    5531
 478          RY     106     104     102   100.1     100     102     104     106

 479          KK     705
 480          KM   SUB-BASIN 705
 481          BA    3.71
 482          LG     .34     .30    4.50     .29    2.00
 483          UI    181.    351.    766.    993.   1231.   1605.   2245.   1781.   1426.   1129.
 484          UI    890.    590.    317.    278.    181.    109.     55.     55.     55.     55.
 485          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 486          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 487          KK     CD5          COMBINE FLOWS PRIOR TO DIVERSION
 488          HC       2

 489          KK      D5          DIVERSION @ SR 85, 705 TO 706 & 707
 490          DT    DIV5
 491          DI       0     100     200     500    1000    2500    5000
 492          DQ       0      27      55     135     270     680    1360
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

493         KK     7R5
494         RS       2    FLOW      -1
495         RL                       1     100
496         RC     .05     .05     .05    5280   .0133     105
497         RX       0     100    3350    4050    4750    5450    8700    8800
498         RY     106     104     102   100.1     100     102     104     106

499         KK     706
500         KM   SUB-BASIN 706
501         BA    2.10
502         LG     .35     .31    3.80     .33     .00
503         UI    312.   1026.   1684.   2276.   1428.    791.    327.    151.     64.     64.
504         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
505         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

506         KK     7C4
507         KM            COMBINE FLOWS FROM BASINS 6 & 7 NORTH OF SKI LAKE
508         HC       3

509         KK   RES12
510         KO       3
511         KM        ROUTE COMBINED HYDROGRAPHS FROM BASINS 6 & 7 NORTH OF SKI LAKE
            *  COMBINED OUTFLOW FROM BERM OVERTOPPING, CONTROL O.T., AND SPILL-TO'S
512         RS       1    ELEV   742.2
513         SV       0     1.9   13.50   58.90   181.1   401.6   702.4
514         SE   742.2     744     746     748     750     752     754
515         SQ       0      80     278     560    1003    1521    1901    2638    9142   15793
516         SE   742.2   743.0   744.0   745.0   746.2   747.3   748.0   749.0   750.0   750.5
            *  THIS SECTION ROUTES FLOW IN SUBBASIN 7 THROUGH THE DEEP CHANNEL

517         KK     RD5
518         KM            RETRIEVE FLOW FROM SUB-BASIN 705
519         DR    DIV5

520         KK     7R6
521         RS       2    FLOW      -1
522         RL                       1     100
523         RC     .05     .05     .05    6034   .0149     105
524         RX       0     100    1490    1670    1850    2030    3420    3520
525         RY     106     104     102   100.1   100.1     102     104     106

526         KK     707
527         KM   SUB-BASIN 707
528         BA     .64
529         LG     .39     .34    4.20     .42     .00
530         UI    127.    391.    721.    633.    365.    140.     58.     22.      0.      0.
531         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

532         KK     7C5
533         KM            COMBINE FLOWS AT CANAL SOUTH OF SKI LAKE
534         HC       2
            *  BASIN NO. 8
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 535          KK     801
 536          KM   SUB-BASIN 801
 537          BA    3.38
 538          LG     .26     .24    8.20     .12   12.00
 539          UI    170.    170.    337.    619.    800.    919.   1035.   1192.   1372.   1790.
 540          UI   2160.   1872.   1576.   1384.   1209.   1039.    895.    771.    568.    373.
 541          UI    297.    279.    214.    170.    166.     52.     52.     52.     52.     52.
 542          UI     52.     52.     52.      0.      0.      0.      0.      0.      0.      0.
 543          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 544          KK     8R1
 545          RS       1    FLOW      -1
 546          RL                     10     100
 547          RC     .05     .05     .05    4724   .0269     105
 548          RX       0     100     350     450     550     650     900    1000
 549          RY     106     104     102   100.1     100     102     104     106

 550          KK     802
 551          KM   SUB-BASIN 802
 552          BA    1.38
 553          LG     .26     .24    8.30     .10    9.00
 554          UI    150.    481.    797.   1061.   1655.   1558.   1135.    831.    534.    258.
 555          UI    185.    103.     46.     46.     46.      0.      0.      0.      0.      0.
 556          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 557          KK     8C1
 558          HC       2

 559          KK     8R2
 560          RS       1    FLOW      -1
 561          RL                     10     100
 562          RC     .05     .05     .05    4274   .0246     105
 563          RX       0     100     401     467     533     599     900    1000
 564          RY     106     104     102   100.1     100     102     104     106

 565          KK     803
 566          KM   SUB-BASIN 803
 567          BA    3.05
 568          LG     .31     .26    6.90     .17    7.00
 569          UI    156.    156.    323.    576.    738.    853.    960.   1111.   1288.   1678.
 570          UI   2004.   1655.   1404.   1241.   1065.    929.    787.    663.    480.    292.
 571          UI    266.    256.    162.    156.    112.     48.     48.     48.     48.     48.
 572          UI     48.     48.      0.      0.      0.      0.      0.      0.      0.      0.
 573          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 574          KK     RD1
 575          KM            RETRIEVE DIVERTED FLOW FROM BASIN 7
 576          DR    DIV1
```

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

 577          KK     8R3
 578          RS       4    FLOW      -1
 579          RL                      10    1119
 580          RC     .05     .05     .05   10308   .0116    1200
 581          RX       0     200    1700    1701    1899    1900    4200    4700
 582          RY    1200    1160    1120  1119.1    1119    1120    1160    1200

 583          KK     8C2
 584          HC       3

 585          KK     8R4
 586          RS       2    FLOW      -1
 587          RL                      10     100
 588          RC     .05     .05     .05    7040   .0114     105
 589          RX       0     100    1390    1720    2050    2380    3671    3771
 590          RY     106     104     102   100.1     100     102     104     106

 591          KK     804
 592          KM   SUB-BASIN 804
 593          BA    5.64
 594          LG     .30     .27    6.50     .22   10.00
 595          UI    311.    311.    782.   1266.   1558.   1795.   2067.   2421.   3127.   3932.
 596          UI   3412.   2833.   2475.   2101.   1793.   1523.   1198.    774.    550.    511.
 597          UI    390.    311.    254.     95.     95.     95.     95.     95.     95.     95.
 598          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 599          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 600          KK     8C3
 601          HC       2

 602          KK     8R5
 603          RS       1    FLOW      -1
 604          RL                      10     100
 605          RC     .05     .05     .05    2765   .0145     105
 606          RX       0     100     959    1157    1355    1553    2413    2514
 607          RY     106     104     102   100.1     100     102     104     106

 608          KK     805
 609          KM   SUB-BASIN 805
 610          BA    1.62
 611          LG     .28     .24    8.20     .11   13.00
 612          UI    134.    265.    573.    742.    921.   1223.   1656.   1294.   1038.    819.
 613          UI    639.    405.    233.    195.    134.     67.     41.     41.     41.     41.
 614          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 615          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 616          KK     8C4
 617          HC       2
```

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

 618          KK     8R6
 619          RS       3    FLOW      -1
 620          RL                      10     100
 621          RC     .05     .05     .05    8045   .0099     105
 622          RX       0     100    1309    1526    1742    1959    3168    3268
 623          RY     106     104     102   100.1     100     102     104     106

 624          KK     806
 625          KM   SUB-BASIN 806
 626          BA     .47
 627          LG     .34     .31    4.40     .31    1.00
 628          UI     33.     45.    122.    164.    196.    237.    305.    415.    340.    277.
 629          UI    229.    187.    149.     99.     58.     54.     34.     30.     10.     10.
 630          UI     10.     10.     10.      0.      0.      0.      0.      0.      0.      0.
 631          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 632          KK     CD2
 633          HC       2

 634          KK      D2
 635          KM            DIVERT FLOWS FROM BASIN 8 TO BASIN 9
 636          DT    DIV2
 637          DI    5500    6730    8350   13460   24200
 638          DQ       0     400    1050    1900    3300

 639          KK     8R7
 640          RS       2    FLOW      -1
 641          RL                      10     100
 642          RC     .05     .05     .05    6034   .0133     105
 643          RX       0     100    2415    2648    2881    3115    5431    5531
 644          RY     106     104     102   100.1     100     102     104     106

 645          KK     807
 646          KM   SUB-BASIN 807
 647          BA    2.54
 648          LG     .33     .27    5.70     .21    5.00
 649          UI    143.    143.    371.    590.    721.    833.    965.   1128.   1492.   1811.
 650          UI   1503.   1261.   1099.    926.    792.    671.    486.    309.    246.    234.
 651          UI    148.    143.     79.     44.     44.     44.     44.     44.     44.      0.
 652          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 653          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 654          KK     8C5
 655          HC       2

 656          KK     8R8
 657          RS       1    FLOW      -1
 658          RL                      10     100
 659          RC     .05     .05     .05    4274   .0112     105
 660          RX       0     100     755     922    1089    1255    1911    2011
 661          RY     106     104     102   100.1     100     102     104     106
```

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

662         KK     808
663         KM   SUB-BASIN 808
664         BA     .31
665         LG     .35     .31    3.80     .32     .00
666         UI     64.    220.    341.    542.    377.    242.    105.     58.     21.     15.
667         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
668         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

669         KK     8C6
670         KM            COMBINE BASIN 8 FLOWS AT CANAL BERM
671         HC       2

672         KK  D8NRTH
673         KM          SPLIT BASIN 8 FLOW TO NORTH
674         DT   D8STH
675         DI       0      92     141     347     842    1694    3659   11024
676         DQ       0       0       5      96     419    1046    1942    3076
            *    COMBINE NORTHWARD FLOW WITH PORTION OF BASIN 7

677         KK   7CMB8
678         KM      COMBINE FLOWS FROM SUB 8 WITH 7C5
679         HC       2
            *  STORAGE ROUTE THROUGH PUMP STN SPILLWAY PLUS SPILLTOS PLUS BERM OT

680         KK  PSPILL
681         KM          ROUTE OUT OF SYSTEM THROUGH PUMP STN SPILLWAY ETC
682         KO       3
683         RS       1    ELEV   742.5
684         SV       0       3      16    48.3   103.4
685         SE   742.5     744     746     748     750
686         SQ       0    10.6      57     136     251     423     648    1717    7948
687         SE   742.5     743     744     745     746     747     748     749     750
            * RETRIEVE DIVERTED FLOW FROM BASIN 8 (FLOW TO SOUTH)

688         KK   FLW8S
689         KM   SOUTHWARD BASIN 8 FLOW
690         DR   D8STH

691         KK   CHAN8
692         KM          ROUTE THROUGH DEEP CHANNEL TO SUB 9
693         RS       1    ELEV      -1
694         SV       0      44      77     105     126     145     162
695         SQ       0    1000    2000    3000    4000    5000    6000
            *  BASIN NO. 9

696         KK     901
697         KM   SUB-BASIN 901
698         BA    2.25
699         LG     .35     .29    3.80     .27    1.00
700         UI    135.    379.    683.    884.   1253.   1608.   1185.    901.    670.    383.
701         UI    230.    156.     90.     41.     41.     41.      0.      0.      0.      0.
702         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

703         KK     RD2
704         KM            RETRIEVE FLOW FROM BASIN 8 DIVERSION
705         DR    DIV2

706         KK     9R1
707         RS       2    FLOW      -1
708         RL                       5     100
709         RC     .05     .05     .05    6285   .0127     105
710         RX       0     100    1740    2090    2440    2790    4440    4540
711         RY     106     104     102   100.1     100     102     104     106

712         KK     9C1
713         HC       2
            * ROUTE W/ R2

714         KK     9R2
715         RS       2    FLOW      -1
716         RL                       5     100
717         RC     .05     .05     .05    5030   .0119     105
718         RX       0     100    1812    2112    2412    2712    4425    4525
719         RY     106     104     102   100.1     100     102     104     106

720         KK   8CMB9
721         KM       COMBINE FLOWS FROM SUB 8 CHAN. ROUTING WITH SUB 9 FLOWS INCLUDING 9R2
722         HC       2

723         KK   CHAN9
724         KM       ROUTE THROUGH DEEP CHANNEL TO SUB 10
725         RS       2    ELEV      -1
726         SV       0      76     153     221     271     316     356
727         SQ       0    1000    2000    3000    4000    5000    6000

728         KK     902
729         KM   SUB-BASIN 902
730         BA    1.26
731         LG     .35     .30    3.60     .29     .00
732         UI    249.    770.   1420.   1246.    718.    276.    114.     43.      0.      0.
733         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

734         KK     9C2
735         KM            COMBINE FLOWS AT CANAL FOR PONDING
736         HC       2
            *   ROUTING FLOW THROUGH COMBINED RESERVOIRS 10 & 11 AND OVER CONRTOL SECT. G

737         KK  RESBS9
738         KM       ROUTE SUB 9 THROUGH RES 10 & 11 AND OVER CONTROL SECT. G
739         KO       3
740         RS       1    ELEV     738
741         SV       0     3.4     7.6      45     120     236     387     559
742         SQ       0      11      66     356     877    1658    3132    5988
743         SE     738     739     740     742     744     746     748     750
            *  BASIN NO. 10
```

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

 744          KK    1001
 745          KM   SUB-BASIN 1001
 746          BA    4.63
 747          LG     .30     .25    7.60     .11    6.00
 748          UI    205.    205.    246.    696.    855.   1012.   1142.   1266.   1438.   1621.
 749          UI   1973.   2536.   2522.   2093.   1827.   1641.   1449.   1267.   1117.    979.
 750          UI    816.    587.    363.    353.    337.    259.    205.    205.    109.     63.
 751          UI     63.     63.     63.     63.     63.     63.     63.      0.      0.      0.
 752          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 753          KK    1002
 754          KM   SUB-BASIN 1002
 755          BA    4.49
 756          LG     .32     .28    5.90     .18    3.00
 757          UI   0240.    240.    561.    941.   1175.   1353.   1544.   1799.   2188.   2927.
 758          UI   2854.   2319.   2005.   1746.   1486.   1268.   1076.    779.    485.    412.
 759          UI    394.    250.    240.    153.     74.     74.     74.     74.     74.     74.
 760          UI     74.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 761          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 762          KK    10C1
 763          HC       2

 764          KK    10R1
 765          RS       3    FLOW      -1
 766          RL                      10     100
 767          RC     .05     .05     .05    8548   .0099     105
 768          RX       0     100    1943    2240    2537    2834    4677    4777
 769          RY     106     104     102   100.1     100     102     104     106

 770          KK    1003
 771          KM   SUB-BASIN 1003
 772          BA     .29
 773          LG     .35     .31    3.80     .33     .00
 774          UI    225.    711.    637.    222.     52.      0.      0.      0.      0.      0.
 775          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 776          KK  9CMB10
 777          KM        COMBINE BASINS 8, 9 & 10 AT CANAL - SIPHON 5
 778          HC       3

 779          KK   SPWY5
 780          KO       3
 781          KM       STORAGE ROUTE IN RES. 9 THRU SPILLWAY AT SIPHON 5
 782          RS       1    ELEV     737
 783          SV       0    0.79    1.75    5.11    9.02   21.15   49.36   96.83  161.38
 784          SE     737     739     740     742     744     746     748     750     752
 785          SQ       0      15     115     341     682    1592    2798    4281
 786          SE     737   737.4     738   738.5     739     740     741     742
              *  FLOW GETS DIVERTED FROM SIPHON 5 OUT OF WATERSHED
 787          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

29        101
           V
           V
36        1R1
           .
           .
42         .        102
           .          .
           .          .
48         .          .        201
           .          .          V
           .          .          V
55         .          .       2R1A
           .          .          V
           .          .          V
61         .          .       2R1B
           .          .          .
           .          .          .
67         .          .          .        202
           .          .          .          .
           .          .          .          .
75        1C1.................................
           V
           V
78     SPLWY1
           .
           .
86         .        300
           .          V
           .          V
94         .      SPLWY2
           .          .
           .          .
101       ADD............
           .
           .
104        .        401
           .          V
           .          V
112        .        4R1
           .          .
           .          .
118        .          .        402
           .          .          .
           .          .          .
126        .          .          .        403
           .          .          .          .
           .          .          .          .
           .        4C1.......................
           .          V
           .          V
136        .        4R2
           .          .
```

```
142          407
             4C2.............
             V
             V
152          4R3
158          404
166                     405
173          4C7.............
             V
             V
175          4R4
181                     406
188          4C3........................
             V
             V
190          4R5
196          408
             V
             V
208          4R6
214                     409
221                     410
229          4C4.....................................
             V
             V
231          4R7
237          411
             V
             V
246          4R8
                        412
259                     413
```

```
                .         .         .         .         .
267             .       4C5.........................................
                .         V
                .         V
                .       4R9
                .         .
                .         .
275             .         .       414
                .         .         .
                .         .         .
284             .         .         .       415
                .         .         .         .
                .         .         .         .
292             .       4C6.........................
                .         V
                .         V
294             .     SPLWY3
                .         .
                .         .
301             .         .       500
                .         .         V
                .         .         V
308             .         .     RES14
                .         .         .
                .         .         .
316             .         .         .       601
                .         .         .         V
                .         .         .         V
324             .         .         .       6R1
                .         .         .         .
                .         .         .         .
330             .         .         .         .       602
                .         .         .         .         .
                .         .         .         .         .
336             .         .         .       6C1............
                .         .         .         V
                .         .         .         V
338             .         .         .       6R2
                .         .         .         .
                .         .         .         .
344             .         .         .         .       603
                .         .         .         .         V
                .         .         .         .         V
351             .         .         .         .       6R3
                .         .         .         .         .
                .         .         .         .         .
357             .         .         .         .         .         604
                .         .         .         .         .           .
                .         .         .         .         .           .
364             .         .         .       6C2.........................
                .         .         .         V
                .         .         .         V
366             .         .         .       6R4
                .         .         .         .
                .         .         .         .
                .         .         .         .       605
                .         .         .         .         V
                .         .         .         .         V
379             .         .         .         .       6R5
                .         .         .         .         .
```

```
385                                606
                                    V
                                    V
                                   6R6
398                                                607
405                                                                608
412                        6C3.......................................
414                                701
                                    V
                                    V
422                                7R1
428                                                702
435                                7C1............
                                    V
                                    V
437                                7R2
443                                                703
451                                CD1............
455                                 .-------->   DIV1
453                                 D1
                                    V
                                    V
458                                7R3
464                                                704
471                                7C2............
                                    V
                                    V
473                                7R4
479                                                705
487                                CD5............
490                                 .-------->   DIV5
```

```
489   .     .     .     .     D5
      .     .     .     .     V
      .     .     .     .     V
      .     .     .     .    7R5
      .     .     .     .     .
      .     .     .     .     .
499   .     .     .     .     .        706
      .     .     .     .     .         .
      .     .     .     .     .         .
506   .     .     .    7C4.......................
      .     .     .     V
      .     .     .     V
509   .     .     .   RES12
      .     .     .     .
      .     .     .     .
519   .     .     .     .     .<-------    DIV5
517   .     .     .     .    RD5
      .     .     .     .     V
      .     .     .     .     V
520   .     .     .     .    7R6
      .     .     .     .     .
      .     .     .     .     .
526   .     .     .     .     .        707
      .     .     .     .     .         .
      .     .     .     .     .         .
532   .     .     .     .    7C5............
      .     .     .     .     .
      .     .     .     .     .
535   .     .     .     .     .        801
      .     .     .     .     .         V
      .     .     .     .     .         V
544   .     .     .     .     .        8R1
      .     .     .     .     .         .
      .     .     .     .     .         .
550   .     .     .     .     .         .        802
      .     .     .     .     .         .         .
      .     .     .     .     .         .         .
557   .     .     .     .     .        8C1............
      .     .     .     .     .         V
      .     .     .     .     .         V
559   .     .     .     .     .        8R2
      .     .     .     .     .         .
      .     .     .     .     .         .
565   .     .     .     .     .         .        803
      .     .     .     .     .         .         .
      .     .     .     .     .         .         .
576   .     .     .     .     .         .         .          .<-------    DIV1
574   .     .     .     .     .         .         .        RD1
      .     .     .     .     .         .         .         V
      .     .     .     .     .         .         .         V
577   .     .     .     .     .         .         .        8R3
      .     .     .     .     .         .         .         .
      .     .     .     .     .         .         .         .
583   .     .     .     .     .        8C2........................
      .     .     .     .     .         V
      .     .     .     .     .         V
585   .     .     .     .     .        8R4
      .     .     .     .     .         .
      .     .     .     .     .         .
591   .     .     .     .     .         .        804
```

```
                                                  .         .
                                                  .         .
600                                             8C3............
                                                  V
                                                  V
602                                             8R5
                                                  .
                                                  .
608                                               .         805
                                                  .           .
                                                  .           .
616                                             8C4............
                                                  V
                                                  V
618                                             8R6
                                                  .
                                                  .
624                                               .         806
                                                  .           .
                                                  .           .
632                                             CD2............
                                                  .
                                                  .
636                                               .-------->    DIV2
634                                              D2
                                                  V
                                                  V
639                                             8R7
                                                  .
                                                  .
645                                               .         807
                                                  .           .
                                                  .           .
654                                             8C5............
                                                  V
                                                  V
656                                             8R8
                                                  .
                                                  .
662                                               .         808
                                                  .           .
                                                  .           .
669                                             8C6............
                                                  .
                                                  .
674                                               .-------->   D8STH
672                                         D8NRTH
                                                  .
                                                  .
677                                   7CMB8............
                                          V
                                          V
680                                   PSPILL
                                          .
                                          .
690                                               .<--------   D8STH
688                                         FLW8S
                                                  V
                                                  V
691                                         CHAN8
```

```
696                                   901
                                       .
                                       .
705                                    .                .<-------   DIV2
703                                    .            RD2
                                       .             V
                                       .             V
706                                    .            9R1
                                       .              .
                                       .              .
712                                    .           9C1............
                                       .             V
                                       .             V
714                                    .           9R2
                                       .              .
                                       .              .
720                                 8CMB9............
                                       V
                                       V
723                                 CHAN9
                                       .
                                       .
728                                    .           902
                                       .              .
                                       .              .
734                                  9C2............
                                       V
                                       V
737                                 RESBS9
                                       .
                                       .
744                                    .          1001
                                       .              .
                                       .              .
753                                    .              .        1002
                                       .              .          .
                                       .              .          .
762                                    .          10C1............
                                       .             V
                                       .             V
764                                    .          10R1
                                       .              .
                                       .              .
770                                    .              .        1003
                                       .              .          .
                                       .              .          .
776                                 9CMB10........................
                                       V
                                       V
779                                 SPWY5
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

HEC1 S/N: HMVersion: 6.00 Data File: RPNEW.HC1

```
****************************************                    ****************************************
*                                      *                    *                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                    *   U.S. ARMY CORPS OF ENGINEERS       *
*          SEPTEMBER 1990              *                    *   HYDROLOGIC ENGINEERING CENTER      *
*           VERSION 4.0                *                    *         609 SECOND STREET            *
*                                      *                    *      DAVIS, CALIFORNIA 95616         *
* RUN DATE  03/09/1992  TIME  09:22:28 *                    *          (916) 756-1104              *
*                                      *                    *                                      *
****************************************                    ****************************************
```

PROJECT: GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DONOHUE PROJECT NO: 18099
DATE: 03/8/92
FILENAME: RPNEW.HC1 BASINS 1 - 10
RUN DESCRIPTION:
STORM EVENT: 100-YR
STORM DURATION: 24-HR
COMBINED RATING CURVES FOR FLOW OVER SPILLWAYS, CANAL BERM, LOW LEVEL OUTLETS (SPILL-TOs, SPILL-UNDERS etc.), AND CONTROL-SECTIONS (OVERFLOW TO NEXT DOWNSTREAM BASIN), WERE USED FOR THE ROUTINGS THROUGH PONDING AREAS ADJACENT TO THE CANAL.
RAINBOW & PALOMA HEC-1 MODELS WERE COMBINED TO BETTER MODEL THE PONDING AREAS IN BASINS 6 AND 7.

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16 IO        OUTPUT CONTROL VARIABLES
                   IPRNT          5  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                    NMIN         10  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1    0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        145  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2    0  ENDING DATE
                  NDTIME       0000  ENDING TIME
                   ICENT         19  CENTURY MARK

             COMPUTATION INTERVAL     .17 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

18 JD        INDEX STORM NO. 1
                   STRM       4.20  PRECIPITATION DEPTH
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TRDA .01 TRANSPOSITION DRAINAGE AREA

19 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

24 JD INDEX STORM NO. 2

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

25 JD INDEX STORM NO. 3

STRM 3.86 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

26 JD INDEX STORM NO. 4

STRM 3.78 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

27 JD INDEX STORM NO. 5

STRM 3.70 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

28 JD INDEX STORM NO. 6

STRM 3.57 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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

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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

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          *            *
 78 KK    *   SPLWY1   *
          *            *
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 80 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

             HYDROGRAPH ROUTING DATA

 63 RL          ROUTING LOSSES
                      QLOSS        .00  INITIAL LOSS
                      CLOSS        .00  ADDITIONAL FRACTION LOST

 81 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC     740.64  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

 82 SV            STORAGE         .0       1.5       6.3      18.2      30.3     130.6     388.6

 83 SE          ELEVATION     740.64    744.00    746.00    748.00    750.00    752.00    754.00

 84 SQ          DISCHARGE         0.       49.      125.      237.      571.     1062.     1274.     1496.     1741.     2619.

 85 SE          ELEVATION     740.64    742.00    743.00    744.00    746.00    748.00    748.67    749.33    750.00    752.00

                                                    ***

                                        COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       .00       .61      1.05      1.50      6.30     18.20     22.25     26.25     30.30    130.60
          OUTFLOW       .00     49.00    125.00    237.00    571.00   1062.00   1274.00   1496.00   1741.00   2619.00
        ELEVATION    740.64    742.00    743.00    744.00    746.00    748.00    748.67    749.33    750.00    752.00

          STORAGE    388.60
          OUTFLOW   3497.00
        ELEVATION    754.00

 ARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN       49. TO      237.
            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.)

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
2051.	13.67	(CFS)	745.	187.	187.	187.
		(INCHES)	.948	.950	.950	.950
		(AC-FT)	370.	370.	370.	370.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
66.	13.67	17.	4.	4.	4.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.71	13.67	745.34	741.82	741.82	741.82

CUMULATIVE AREA = 7.31 SQ MI

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1928.	13.67	(CFS)	672.	168.	168.	168.
		(INCHES)	.854	.856	.856	.856
		(AC-FT)	333.	334.	334.	334.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
52.	13.67	13.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.43	13.67	745.08	741.76	741.76	741.76

CUMULATIVE AREA = 7.31 SQ MI

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1858.	13.67	(CFS)	627.	157.	157.	157.
		(INCHES)	.797	.798	.798	.798
		(AC-FT)	311.	311.	311.	311.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
44.	13.67	11.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.27	13.67	744.92	741.72	741.72	741.72

CUMULATIVE AREA = 7.31 SQ MI

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1816.	13.67	(CFS)	599.	150.	150.	150.
		(INCHES)	.762	.763	.763	.763
		(AC-FT)	297.	298.	298.	298.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
39.	13.67	10.	3.	3.	3.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.17	13.67	744.82	741.69	741.69	741.69

CUMULATIVE AREA = 7.31 SQ MI

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1783.	13.50	(CFS)	571.	143.	143.	143.
		(INCHES)	.727	.728	.728	.728
		(AC-FT)	283.	284.	284.	284.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
35.	13.50	9.	2.	2.	2.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.10	13.50	744.72	741.67	741.67	741.67

CUMULATIVE AREA = 7.31 SQ MI

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HYDROGRAPH AT STATION SPLWY1
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1732.	13.50	(CFS)	527.	132.	132.	132.
		(INCHES)	.670	.671	.671	.671
		(AC-FT)	261.	262.	262.	262.

PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE

(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.00-HR
30.	13.50	8.	2.	2.	2.

STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.98	13.50	744.55	741.62	741.62	741.62

CUMULATIVE AREA = 7.31 SQ MI

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INTERPOLATED HYDROGRAPH AT SPLWY1

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1934.	13.67	(CFS)	675.	169.	169.	169.
		(INCHES)	.859	.860	.860	.860
		(AC-FT)	335.	335.	335.	335.

CUMULATIVE AREA = 7.31 SQ MI

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              *            *
308 KK        *     RES14  *
              *            *
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309 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          3  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                               ROUTE BASIN 5N AND 5S INTO RESERVOIR NO. 14

              HYDROGRAPH ROUTING DATA

271 RL          ROUTING LOSSES
                      QLOSS        .00  INITIAL LOSS
                      CLOSS        .00  ADDITIONAL FRACTION LOST

311 RS          STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC     744.00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

312 SV            STORAGE        .0       .4      1.1     14.4    145.1

313 SE          ELEVATION    744.00   745.00   746.00   748.00   750.00

314 SQ          DISCHARGE        0.       3.      18.      49.     178.     417.    1031.    2884.    5996.

315 SE          ELEVATION    749.50   749.60   749.70   749.80   750.00   750.20   750.50   751.00   751.50
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.45	1.09	14.36	112.42	118.95	125.49	132.03	145.10	158.17
OUTFLOW	.00	.00	.00	.00	.00	3.00	18.00	49.00	178.00	417.00
ELEVATION	744.00	745.00	746.00	748.00	749.50	749.60	749.70	749.80	750.00	750.20

STORAGE	177.79	210.47	243.16
OUTFLOW	1031.00	2884.00	5996.00
ELEVATION	750.50	751.00	751.50

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HYDROGRAPH AT STATION RES14
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
110.	13.67	(CFS)	42.	12.	12.	12.
		(INCHES)	.124	.145	.145	.145
		(AC-FT)	21.	25.	25.	25.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
138.	13.67	129.	60.	60.	60.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.89	13.67	749.76	746.84	746.84	746.84

CUMULATIVE AREA = 3.17 SQ MI

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HYDROGRAPH AT STATION RES14
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
22.	14.17	(CFS)	13.	4.	4.	4.
		(INCHES)	.039	.051	.051	.051
		(AC-FT)	7.	9.	9.	9.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
126.	14.17	123.	58.	58.	58.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.71	14.17	749.67	746.80	746.80	746.80

CUMULATIVE AREA = 3.17 SQ MI

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HYDROGRAPH AT STATION RES14

TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
2.	14.33	(CFS)	2.	1.	1.	1.
		(INCHES)	.006	.009	.009	.009
		(AC-FT)	1.	2.	2.	2.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
117.	14.33	117.	55.	55.	55.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.57	14.33	749.56	746.76	746.76	746.76

CUMULATIVE AREA = 3.17 SQ MI

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HYDROGRAPH AT STATION RES14
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
0.	.17	(CFS)	0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
111.	14.33	111.	52.	52.	52.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.47	14.33	749.47	746.71	746.71	746.71

CUMULATIVE AREA = 3.17 SQ MI

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HYDROGRAPH AT STATION RES14
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
0.	.17	(CFS)	0.	0.	0.	0.
		(INCHES)	.000	.000	.000	.000
		(AC-FT)	0.	0.	0.	0.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
104.	14.33	104.	49.	49.	49.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.37	14.33	749.37	746.66	746.66	746.66

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                    CUMULATIVE AREA =    3.17 SQ MI

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

                    HYDROGRAPH AT STATION    RES14
                  TRANSPOSITION AREA    100.0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.00-HR
     0.         .17       (CFS)       0.          0.          0.          0.
                        (INCHES)     .000        .000        .000        .000
                         (AC-FT)       0.          0.          0.          0.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                 6-HR       24-HR       72-HR     24.00-HR
     93.      14.33                  93.         44.         44.         44.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                 6-HR       24-HR       72-HR     24.00-HR
   749.20     14.33               749.21      746.58      746.58      746.58

                    CUMULATIVE AREA =    3.17 SQ MI

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


                    INTERPOLATED HYDROGRAPH AT    RES14

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                 6-HR       24-HR       72-HR     24.00-HR
     35.      14.00       (CFS)      18.          6.          6.          6.
                        (INCHES)     .053        .067        .067        .067
                         (AC-FT)       9.         11.         11.         11.

                    CUMULATIVE AREA =    3.17 SQ MI


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


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          *            *
509 KK    *     RES12  *
          *            *
          **************

510 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          3  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                             ROUTE COMBINED HYDROGRAPHS FROM BASINS 6 & 7 NORTH OF SKI LAKE

            HYDROGRAPH ROUTING DATA

495 RL          ROUTING LOSSES
                     QLOSS        .00  INITIAL LOSS
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                    CLOSS        .00  ADDITIONAL FRACTION LOST

512 RS        STORAGE ROUTING
                   NSTPS          1  NUMBER OF SUBREACHES
                    ITYP       ELEV  TYPE OF INITIAL CONDITION
                  RSVRIC     742.20  INITIAL CONDITION
                       X        .00 WORKING R AND D COEFFICIENT

513 SV          STORAGE         .0       1.9      13.5      58.9     181.1     401.6     702.4

514 SE        ELEVATION     742.20    744.00    746.00    748.00    750.00    752.00    754.00

515 SQ        DISCHARGE         0.       80.      278.      560.     1003.     1521.     1901.     2638.     9142.    15793.

516 SE        ELEVATION     742.20    743.00    744.00    745.00    746.20    747.30    748.00    749.00    750.00    750.50

                                                          ***

                                        COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       .00       .84      1.90      7.70     13.50     18.04     43.01     58.90    120.00    181.10
          OUTFLOW       .00     80.00    278.00    560.00    929.16   1003.00   1521.00   1901.00   2638.00   9142.00
        ELEVATION    742.20    743.00    744.00    745.00    746.00    746.20    747.30    748.00    749.00    750.00

          STORAGE    236.23    401.60    702.40
          OUTFLOW  15793.00  35746.00  62350.00
        ELEVATION    750.50    752.00    754.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN       80. TO      278.
              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    RES12
                   TRANSPOSITION AREA       .0 SQ MI

 PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
   (CFS)       (HR)                  6-HR       24-HR       72-HR     24.00-HR
   7021.      13.00        (CFS)    3257.       830.        830.        830.
                         (INCHES)    .835       .851        .851        .851
                          (AC-FT)   1615.      1646.       1646.       1646.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
  (AC-FT)      (HR)                  6-HR       24-HR       72-HR     24.00-HR
    161.      13.00                   98.        25.         25.         25.

 PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
   (FEET)      (HR)                  6-HR       24-HR       72-HR     24.00-HR
   749.67      13.00               748.32     743.84      743.84      743.84

                   CUMULATIVE AREA =   36.25 SQ MI

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

                     HYDROGRAPH AT STATION    RES12
                   TRANSPOSITION AREA     10.0 SQ MI
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
6370.	13.00	(CFS)	2953.	753.	753.	753.
		(INCHES)	.757	.772	.772	.772
		(AC-FT)	1464.	1493.	1493.	1493.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
155.	13.00	93.	23.	23.	23.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.57	13.00	748.20	743.80	743.80	743.80

CUMULATIVE AREA = 36.25 SQ MI

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HYDROGRAPH AT STATION RES12
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5964.	13.00	(CFS)	2768.	705.	705.	705.
		(INCHES)	.710	.724	.724	.724
		(AC-FT)	1372.	1399.	1399.	1399.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
151.	13.00	90.	23.	23.	23.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.51	13.00	748.12	743.78	743.78	743.78

CUMULATIVE AREA = 36.25 SQ MI

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

HYDROGRAPH AT STATION RES12
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5704.	13.00	(CFS)	2654.	677.	677.	677.
		(INCHES)	.681	.694	.694	.694
		(AC-FT)	1316.	1342.	1342.	1342.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
149.	13.00	88.	22.	22.	22.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.47	13.00	748.06	743.76	743.76	743.76

CUMULATIVE AREA = 36.25 SQ MI

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HYDROGRAPH AT STATION RES12
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5399.	13.00	(CFS)	2542.	648.	648.	648.
		(INCHES)	.652	.665	.665	.665
		(AC-FT)	1260.	1285.	1285.	1285.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
146.	13.00	86.	22.	22.	22.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.42	13.00	748.01	743.75	743.75	743.75

CUMULATIVE AREA = 36.25 SQ MI

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HYDROGRAPH AT STATION RES12
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4899.	13.00	(CFS)	2361.	602.	602.	602.
		(INCHES)	.606	.618	.618	.618
		(AC-FT)	1171.	1195.	1195.	1195.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
141.	13.00	83.	21.	21.	21.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.35	13.00	747.92	743.72	743.72	743.72

CUMULATIVE AREA = 36.25 SQ MI

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INTERPOLATED HYDROGRAPH AT RES12

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5591.	13.00	(CFS)	2612.	666.	666.	666.
		(INCHES)	.670	.683	.683	.683
		(AC-FT)	1295.	1321.	1321.	1321.

CUMULATIVE AREA = 36.25 SQ MI

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          *            *
680 KK    *   PSPILL   *
          *            *
          **************

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

             HYDROGRAPH ROUTING DATA

658 RL          ROUTING LOSSES
                     QLOSS        .00  INITIAL LOSS
                     CLOSS        .00  ADDITIONAL FRACTION LOST

683 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC     742.50  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

684 SV            STORAGE        .0      3.0     16.0     48.3    103.4

685 SE          ELEVATION    742.50   744.00   746.00   748.00   750.00

686 SQ          DISCHARGE        0.      11.      57.     136.     251.     423.     648.    1717.    7948.

687 SE          ELEVATION    742.50   743.00   744.00   745.00   746.00   747.00   748.00   749.00   750.00

                                                          ***

                                        COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       .00     1.00     3.00     9.50    16.00    32.15    48.30    75.85   103.40
          OUTFLOW       .00    10.60    57.00   136.00   251.00   423.00   648.00  1717.00  7948.00
        ELEVATION    742.50   743.00   744.00   745.00   746.00   747.00   748.00   749.00   750.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN     1717. TO     7948.
               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   PSPILL
                     TRANSPOSITION AREA       .0 SQ MI

PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
  (CFS)       (HR)                 6-HR       24-HR       72-HR     24.00-HR
  5037.      14.50       (CFS)    2000.        517.        517.        517.
                       (INCHES)    .977       1.011       1.011       1.011
                        (AC-FT)    992.       1026.       1026.       1026.

PEAK STORAGE   TIME                          MAXIMUM AVERAGE STORAGE
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(AC-FT)	(HR)	6-HR	24-HR	72-HR	24.00-HR
91.	14.50	62.	17.	17.	17.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.53	14.50	748.37	744.30	744.30	744.30

CUMULATIVE AREA = 19.03 SQ MI

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HYDROGRAPH AT STATION PSPILL
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4537.	14.50	(CFS)	1770.	459.	459.	459.
		(INCHES)	.865	.897	.897	.897
		(AC-FT)	878.	910.	910.	910.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
88.	14.50	59.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.45	14.50	748.27	744.26	744.26	744.26

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION PSPILL
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4210.	14.50	(CFS)	1627.	422.	422.	422.
		(INCHES)	.795	.825	.825	.825
		(AC-FT)	807.	838.	838.	838.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
87.	14.50	58.	15.	15.	15.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.40	14.50	748.19	744.23	744.23	744.23

CUMULATIVE AREA = 19.03 SQ MI

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HYDROGRAPH AT STATION PSPILL
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

(CFS)	(HR)		6-HR	24-HR	72-HR	24.00-HR
4008.	14.50	(CFS)	1541.	400.	400.	400.
		(INCHES)	.753	.782	.782	.782
		(AC-FT)	764.	794.	794.	794.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
86.	14.50	57.	15.	15.	15.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.37	14.50	748.14	744.22	744.22	744.22

CUMULATIVE AREA = 19.03 SQ MI

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HYDROGRAPH AT STATION PSPILL
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3800.	14.50	(CFS)	1455.	378.	378.	378.
		(INCHES)	.711	.739	.739	.739
		(AC-FT)	721.	751.	751.	751.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
85.	14.50	56.	15.	15.	15.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
749.33	14.50	748.10	744.20	744.20	744.20

CUMULATIVE AREA = 19.03 SQ MI

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HYDROGRAPH AT STATION PSPILL
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3442.	14.50	(CFS)	1316.	343.	343.	343.
		(INCHES)	.643	.670	.670	.670
		(AC-FT)	653.	680.	680.	680.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
83.	14.50	54.	14.	14.	14.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
9.28	14.50	748.01	744.17	744.17	744.17

CUMULATIVE AREA = 19.03 SQ MI

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INTERPOLATED HYDROGRAPH AT PSPILL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4234.	14.50	(CFS)	1637.	425.	425.	425.
		(INCHES)	.800	.830	.830	.830
		(AC-FT)	812.	843.	843.	843.

CUMULATIVE AREA = 19.03 SQ MI

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              *            *
737 KK        *   RESBS9   *
              *            *
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739 KO OUTPUT CONTROL VARIABLES

IPRNT	3	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

716 RL ROUTING LOSSES

QLOSS	.00	INITIAL LOSS
CLOSS	.00	ADDITIONAL FRACTION LOST

740 RS STORAGE ROUTING

NSTPS	1	NUMBER OF SUBREACHES
ITYP	ELEV	TYPE OF INITIAL CONDITION
RSVRIC	738.00	INITIAL CONDITION
X	.00	WORKING R AND D COEFFICIENT

741 SV	STORAGE	.0	3.4	7.6	45.0	120.0	236.0	387.0	559.0
742 SQ	DISCHARGE	0.	11.	66.	356.	877.	1658.	3132.	5988.
743 SE	ELEVATION	738.00	739.00	740.00	742.00	744.00	746.00	748.00	750.00

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA .0 SQ MI

FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1675.	16.67	(CFS)	1210.	375.	375.	375.
		(INCHES)	3.205	3.969	3.969	3.969
		(AC-FT)	600.	743.	743.	743.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
238.	16.67	170.	52.	52.	52.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
746.02	16.67	744.81	740.56	740.56	740.56

CUMULATIVE AREA = 3.51 SQ MI

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1567.	16.67	(CFS)	1121.	346.	346.	346.
		(INCHES)	2.969	3.667	3.667	3.667
		(AC-FT)	556.	687.	687.	687.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
222.	16.67	156.	48.	48.	48.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
[illegible].77	16.67	744.56	740.46	740.46	740.46

CUMULATIVE AREA = 3.51 SQ MI

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1500.	16.67	(CFS)	1064.	328.	328.	328.
		(INCHES)	2.818	3.476	3.476	3.476
		(AC-FT)	528.	651.	651.	651.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
213.	16.67	148.	45.	45.	45.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
745.60	16.67	744.40	740.40	740.40	740.40

CUMULATIVE AREA = 3.51 SQ MI

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1458.	16.67	(CFS)	1029.	317.	317.	317.
		(INCHES)	2.725	3.357	3.357	3.357
		(AC-FT)	510.	628.	628.	628.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
206.	16.67	143.	43.	43.	43.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
745.49	16.67	744.29	740.36	740.36	740.36

CUMULATIVE AREA = 3.51 SQ MI

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1414.	16.67	(CFS)	992.	305.	305.	305.
		(INCHES)	2.629	3.236	3.236	3.236
		(AC-FT)	492.	606.	606.	606.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
200.	16.67	138.	42.	42.	42.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
745.37	16.67	744.19	740.32	740.32	740.32

CUMULATIVE AREA = 3.51 SQ MI

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HYDROGRAPH AT STATION RESBS9
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
1339.	16.67	(CFS)	932.	287.	287.	287.
		(INCHES)	2.470	3.036	3.036	3.036
		(AC-FT)	462.	568.	568.	568.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
189.	16.67	129.	39.	39.	39.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
745.18	16.67	744.01	740.25	740.25	740.25

CUMULATIVE AREA = 3.51 SQ MI

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INTERPOLATED HYDROGRAPH AT RESBS9

PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.00-HR
1583.	16.67	(CFS)	1134.	350.	350.	350.
		(INCHES)	3.004	3.713	3.713	3.713
		(AC-FT)	562.	695.	695.	695.

CUMULATIVE AREA = 3.51 SQ MI

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          *            *
779 KK    *     SPWY5  *
          *            *
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780 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          3  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE
                          STORAGE ROUTE IN RES. 9 THRU SPILLWAY AT SIPHON 5

            HYDROGRAPH ROUTING DATA

766 RL        ROUTING LOSSES
                   QLOSS        .00  INITIAL LOSS
                   CLOSS        .00  ADDITIONAL FRACTION LOST

782 RS        STORAGE ROUTING
                   NSTPS          1  NUMBER OF SUBREACHES
                    ITYP       ELEV  TYPE OF INITIAL CONDITION
                  RSVRIC     737.00  INITIAL CONDITION
                       X        .00 WORKING R AND D COEFFICIENT

783 SV          STORAGE        .0       .8      1.8      5.1      9.0     21.1     49.4     96.8    161.4

784 SE        ELEVATION     737.00   739.00   740.00   742.00   744.00   746.00   748.00   750.00   752.00

785 SQ        DISCHARGE        0.      15.     115.     341.     682.    1592.    2798.    4281.

786 SE        ELEVATION     737.00   737.40   738.00   738.50   739.00   740.00   741.00   742.00
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COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.16	.40	.59	.79	1.75	3.43	5.11	9.02	21.15
OUTFLOW	.00	15.00	115.00	341.00	682.00	1592.00	2798.00	4281.00	7247.00	10213.00
ELEVATION	737.00	737.40	738.00	738.50	739.00	740.00	741.00	742.00	744.00	746.00

STORAGE	49.36	96.83	161.38
OUTFLOW	13179.00	16145.00	19111.00
ELEVATION	748.00	750.00	752.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 15. TO 10213.
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 SPWY5
TRANSPOSITION AREA .0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
6071.	14.17	(CFS)	2875.	820.	820.	820.
		(INCHES)	2.069	2.360	2.360	2.360
		(AC-FT)	1426.	1626.	1626.	1626.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
7.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
743.21	14.17	740.93	738.36	738.36	738.36

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT STATION SPWY5
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5562.	14.17	(CFS)	2626.	749.	749.	749.
		(INCHES)	1.890	2.156	2.156	2.156
		(AC-FT)	1302.	1485.	1485.	1485.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
7.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
742.86	14.17	740.74	738.30	738.30	738.30

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT STATION SPWY5
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR

5253.	14.17	(CFS)	2473.	705.	705.	705.
		(INCHES)	1.780	2.030	2.030	2.030
		(AC-FT)	1226.	1399.	1399.	1399.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
6.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
742.66	14.17	740.62	738.26	738.26	738.26

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT STATION SPWY5
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5067.	14.17 (CFS)	2380.	679.	679.	679.
	(INCHES)	1.713	1.953	1.953	1.953
	(AC-FT)	1180.	1346.	1346.	1346.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
6.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
742.53	14.17	740.54	738.24	738.24	738.24

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT STATION SPWY5
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4885.	14.17 (CFS)	2287.	652.	652.	652.
	(INCHES)	1.646	1.876	1.876	1.876
	(AC-FT)	1134.	1293.	1293.	1293.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
6.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
[illegible].41	14.17	740.47	738.21	738.21	738.21

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT STATION SPWY5
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4577.	14.17	(CFS)	2135.	608.	608.	608.
		(INCHES)	1.536	1.751	1.751	1.751
		(AC-FT)	1059.	1206.	1206.	1206.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
6.	14.17	3.	1.	1.	1.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
742.20	14.17	740.35	738.17	738.17	738.17

CUMULATIVE AREA = 12.92 SQ MI

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INTERPOLATED HYDROGRAPH AT SPWY5

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5448.	14.17	(CFS)	2569.	733.	733.	733.
		(INCHES)	1.849	2.109	2.109	2.109
		(AC-FT)	1274.	1453.	1453.	1453.

CUMULATIVE AREA = 12.92 SQ MI

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	101	903.	12.50	143.	38.	38.	.87		
ROUTED TO	1R1	606.	13.00	136.	34.	34.	.87		
HYDROGRAPH AT	102	758.	12.17	87.	22.	22.	.92		
HYDROGRAPH AT	201	3193.	12.50	564.	152.	152.	2.90		
ROUTED TO	2R1A	1032.	13.17	159.	40.	40.	2.90		
ROUTED TO	2R1B	975.	13.50	153.	38.	38.	2.90		
HYDROGRAPH AT	202	1297.	13.00	314.	78.	78.	2.62		
4 COMBINED AT	1C1	2454.	13.33	675.	169.	169.	7.31		
ROUTED TO	SPLWY1	1934.	13.67	675.	169.	169.	7.31		
HYDROGRAPH AT	300	2187.	13.00	502.	132.	132.	3.78		
ROUTED TO	SPLWY2	1566.	13.33	502.	132.	132.	3.78		
2 COMBINED AT	ADD	3413.	13.50	1157.	297.	297.	11.09		
HYDROGRAPH AT	401	1600.	13.00	380.	96.	96.	2.87		
ROUTED TO	4R1	1283.	13.33	265.	66.	66.	2.87		
HYDROGRAPH AT	402	1206.	13.00	286.	72.	72.	2.04		
HYDROGRAPH AT	403	2548.	13.17	635.	162.	162.	5.09		
3 COMBINED AT	4C1	4788.	13.17	1170.	296.	296.	10.00		
ROUTED TO	4R2	3642.	13.83	816.	204.	204.	10.00		
HYDROGRAPH AT	407	3441.	13.17	858.	219.	219.	6.93		
2 COMBINED AT	4C2	5359.	13.67	1593.	402.	402.	16.93		
ROUTED TO	4R3	5108.	13.67	1535.	384.	384.	16.93		
HYDROGRAPH AT	404	1887.	13.33	513.	128.	128.	3.87		
HYDROGRAPH AT	405	441.	12.50	73.	18.	18.	.53		
2 COMBINED AT	4C7	2016.	13.17	584.	146.	146.	4.40		
ROUTED TO	4R4	1639.	13.50	531.	133.	133.	4.40		
HYDROGRAPH AT	406	1549.	12.50	252.	66.	66.	1.83		

3 COMBINED AT	4C3	6440.	13.67	2212.	556.	556.	23.16
ROUTED TO	4R5	5857.	14.00	2034.	509.	509.	23.16
HYDROGRAPH AT	408	1565.	15.00	789.	218.	218.	6.47
ROUTED TO	4R6	1496.	15.00	760.	201.	201.	6.47
HYDROGRAPH AT	409	1055.	12.33	126.	32.	32.	1.13
HYDROGRAPH AT	410	1669.	13.00	406.	105.	105.	2.92
4 COMBINED AT	4C4	6810.	14.00	3105.	795.	795.	33.68
ROUTED TO	4R7	6390.	14.17	2835.	716.	716.	33.68
HYDROGRAPH AT	411	2737.	13.33	785.	204.	204.	6.03
ROUTED TO	4R8	926.	14.17	168.	42.	42.	6.03
HYDROGRAPH AT	412	1552.	12.67	280.	71.	71.	2.36
HYDROGRAPH AT	413	628.	13.00	148.	37.	37.	1.24
4 COMBINED AT	4C5	7098.	14.17	3247.	824.	824.	43.31
ROUTED TO	4R9	6688.	14.33	2920.	732.	732.	43.31
HYDROGRAPH AT	414	1568.	13.50	522.	139.	139.	3.63
HYDROGRAPH AT	415	1916.	12.83	379.	95.	95.	3.55
3 COMBINED AT	4C6	7439.	14.33	3626.	925.	925.	50.49
ROUTED TO	SPLWY3	7436.	14.33	3626.	925.	925.	50.49
HYDROGRAPH AT	500	1599.	12.67	263.	66.	66.	3.17
ROUTED TO	RES14	35.	14.00	18.	6.	6.	3.17
HYDROGRAPH AT	601	2317.	12.83	521.	138.	138.	3.68
ROUTED TO	6R1	1668.	13.33	406.	101.	101.	3.68
HYDROGRAPH AT	602	435.	12.17	51.	13.	13.	.44
2 COMBINED AT	6C1	1668.	13.33	456.	114.	114.	4.12
ROUTED TO	6R2	1512.	13.67	454.	114.	114.	4.12
HYDROGRAPH AT	603	2204.	12.33	279.	71.	71.	2.28
ROUTED TO	6R3	1943.	12.50	251.	63.	63.	2.28
HYDROGRAPH AT	604	391.	12.50	56.	14.	14.	.60
3 COMBINED AT	6C2	2540.	12.50	752.	188.	188.	7.00
ROUTED TO	6R4	2051.	12.67	611.	153.	153.	7.00

HYDROGRAPH AT	605	1043.	12.67	184.	46.	46.	1.60
ROUTED TO	6R5	843.	12.83	137.	34.	34.	1.60
HYDROGRAPH AT	606	3071.	12.67	596.	159.	159.	3.64
ROUTED TO	6R6	2331.	13.00	436.	109.	109.	3.64
HYDROGRAPH AT	607	614.	12.67	103.	26.	26.	1.13
HYDROGRAPH AT	608	372.	12.33	47.	12.	12.	.37
5 COMBINED AT	6C3	5297.	12.83	1274.	319.	319.	13.74
HYDROGRAPH AT	701	4331.	12.83	937.	248.	248.	6.40
ROUTED TO	7R1	3802.	13.17	906.	229.	229.	6.40
HYDROGRAPH AT	702	3689.	12.50	647.	174.	174.	4.32
2 COMBINED AT	7C1	5948.	12.67	1531.	397.	397.	10.72
ROUTED TO	7R2	5074.	13.17	1493.	378.	378.	10.72
HYDROGRAPH AT	703	1713.	13.00	432.	116.	116.	2.73
2 COMBINED AT	CD1	6562.	13.17	1881.	483.	483.	13.45
DIVERSION TO	DIV1	1320.	13.17	361.	90.	90.	13.45
HYDROGRAPH AT	D1	5242.	13.17	1520.	393.	393.	13.45
ROUTED TO	7R3	4761.	13.50	1482.	375.	375.	13.45
HYDROGRAPH AT	704	3037.	12.50	510.	140.	140.	3.25
2 COMBINED AT	7C2	4935.	13.50	1934.	502.	502.	16.70
ROUTED TO	7R4	4193.	14.33	1605.	403.	403.	16.70
HYDROGRAPH AT	705	2241.	12.83	482.	123.	123.	3.71
2 COMBINED AT	CD5	4260.	14.33	1998.	511.	511.	20.41
DIVERSION TO	DIV5	1159.	14.33	543.	139.	139.	20.41
HYDROGRAPH AT	D5	3101.	14.33	1455.	372.	372.	20.41
ROUTED TO	7R5	2854.	14.67	1326.	336.	336.	20.41
HYDROGRAPH AT	706	2102.	12.33	264.	66.	66.	2.10
3 COMBINED AT	7C4	5815.	12.83	2616.	666.	666.	36.25
ROUTED TO	RES12	5591.	13.00	2612.	666.	666.	36.25
HYDROGRAPH AT	RD5	1159.	14.33	543.	139.	139.	20.41
ROUTED TO	7R6	1079.	14.67	503.	129.	129.	20.41

HYDROGRAPH AT	707	602.	12.33	71.	18.	18.	.64
2 COMBINED AT	7C5	1199.	14.67	618.	161.	161.	.64
HYDROGRAPH AT	801	2902.	13.50	989.	268.	268.	3.38
ROUTED TO	8R1	2585.	13.67	825.	206.	206.	3.38
HYDROGRAPH AT	802	2176.	12.67	416.	110.	110.	1.38
2 COMBINED AT	8C1	3057.	12.67	1230.	314.	314.	4.76
ROUTED TO	8R2	2742.	12.83	1117.	279.	279.	4.76
HYDROGRAPH AT	803	2453.	13.50	798.	210.	210.	3.05
HYDROGRAPH AT	RD1	1320.	13.17	361.	90.	90.	13.45
ROUTED TO	8R3	494.	13.67	72.	18.	18.	13.45
3 COMBINED AT	8C2	5522.	13.50	1978.	505.	505.	7.81
ROUTED TO	8R4	4173.	13.83	1303.	326.	326.	7.81
HYDROGRAPH AT	804	4556.	13.33	1413.	382.	382.	5.64
2 COMBINED AT	8C3	7741.	13.50	2630.	685.	685.	13.45
ROUTED TO	8R5	7250.	13.67	2415.	604.	604.	13.45
HYDROGRAPH AT	805	2084.	12.83	493.	134.	134.	1.62
2 COMBINED AT	8C4	7998.	13.50	2858.	725.	725.	15.07
ROUTED TO	8R6	6355.	14.17	2185.	546.	546.	15.07
HYDROGRAPH AT	806	421.	13.00	101.	25.	25.	.47
2 COMBINED AT	CD2	6434.	14.00	2272.	568.	568.	15.54
DIVERSION TO	DIV2	304.	14.00	35.	9.	9.	15.54
HYDROGRAPH AT	D2	6130.	14.00	2238.	560.	560.	15.54
ROUTED TO	8R7	5188.	14.50	1787.	447.	447.	15.54
HYDROGRAPH AT	807	2117.	13.33	628.	164.	164.	2.54
2 COMBINED AT	8C5	5994.	14.17	2350.	594.	594.	18.08
ROUTED TO	8R8	5417.	14.50	2053.	513.	513.	18.08
HYDROGRAPH AT	808	506.	12.33	67.	17.	17.	.31
2 COMBINED AT	8C6	5417.	14.50	2114.	529.	529.	18.39
DIVERSION TO	D8STH	2212.	14.50	990.	247.	247.	18.39
HYDROGRAPH AT	D8NRTH	3198.	14.50	1121.	280.	280.	18.39

2 COMBINED AT	7CMB8	4249.	14.50	1675.	425.	425.	19.03
ROUTED TO	PSPILL	4234.	14.50	1637.	425.	425.	19.03
HYDROGRAPH AT	FLW8S	2212.	14.50	990.	247.	247.	18.39
ROUTED TO	CHAN8	2135.	15.00	986.	247.	247.	18.39
HYDROGRAPH AT	901	1699.	12.67	311.	78.	78.	2.25
HYDROGRAPH AT	RD2	304.	14.00	35.	9.	9.	15.54
ROUTED TO	9R1	0.	.17	0.	0.	0.	15.54
2 COMBINED AT	9C1	1699.	12.67	313.	79.	79.	2.25
ROUTED TO	9R2	1158.	13.00	202.	51.	51.	2.25
2 COMBINED AT	8CMB9	2195.	14.83	1247.	313.	313.	2.25
ROUTED TO	CHAN9	2066.	15.67	1228.	313.	313.	2.25
HYDROGRAPH AT	902	1407.	12.17	168.	42.	42.	1.26
2 COMBINED AT	9C2	2066.	15.67	1334.	355.	355.	3.51
ROUTED TO	RESBS9	1583.	16.67	1134.	350.	350.	3.51
HYDROGRAPH AT	1001	3563.	13.83	1304.	341.	341.	4.63
HYDROGRAPH AT	1002	3636.	13.50	1120.	287.	287.	4.49
2 COMBINED AT	10C1	6699.	13.67	2404.	623.	623.	9.12
ROUTED TO	10R1	4885.	14.17	1555.	389.	389.	9.12
HYDROGRAPH AT	1003	629.	12.17	61.	15.	15.	.29
3 COMBINED AT	9CMB10	5447.	14.17	2569.	733.	733.	12.92
ROUTED TO	SPWY5	5448.	14.17	2569.	733.	733.	12.92

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:01:21.34 (81.34 Seconds)
NORMAL END OF HEC-1

HEC1 S/N: HMVersion: 6.00 Data File: SKILKS.HC1

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  11/17/1991  TIME  13:14:40 *
*                                      *
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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  X        X               X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX         XXX
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:::  Full Microcomputer Implementation :::
:::                by                :::
:::       Haestad Methods, Inc.      :::
:::                                  :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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

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

  1           ID            PROJECT: GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
  2           ID            CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  3           ID            DONOHUE PROJECT NO: 18099
  4           ID            DATE: 11/10/91
  5           ID            FILENAME: SKILKS.HC1        BASINS 7(PART) AND 8 - 10
  6           ID            RUN DESCRIPTION:
  7           ID                STORM EVENT: 100-YR
  8           ID                STORM DURATION: 24-HR
  9           ID                COMBINED RATING CURVES FOR FLOW OVER SPILLWAYS, CANAL BERM,
 10           ID                LOW LEVEL OUTLETS (SPILL-TOs, SPILL-UNDERS etc.), AND CONTROL-
 11           ID                SECTIONS (OVERFLOW TO NEXT DOWNSTREAM BASIN), WERE USED FOR THE
 12           ID                ROUTINGS THROUGH PONDING AREAS ADJACENT TO THE CANAL.
 13           ID                AREA SOUTH OF SKI LAKE SOUTH TO SIPHON SPILLWAY
 14           IT      10                    145
 15           IO       5
              *DIAGRAM
 16           IN      30
 17           JD    4.20     .01
 18           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 19           PC    .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
 20           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 21           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 22           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 23           JD    3.99    10.0
 24           JD    3.86    20.0
 25           JD    3.78    30.0
 26           JD    3.70    50.0
 27           JD    3.57   100.0
              *  BASIN NO. 7 MODEL PART OF BASIN 7 NORTH OF SKI LAKE BECAUSE THERE ARE TWO
              *  DIVERSIONS OF FLOW TO AREAS SOUTH OF SKI LAKE

 28           KK     701
 29           KM   SUB-BASIN 701
 30           BA    6.40
 31           LG     .31     .28    6.40     .21    7.00
 32           UI    326.    690.   1436.   1862.   2327.   3226.   3956.   2959.   2363.   1841.
 33           UI   1383.    743.    549.    377.    272.    100.    100.    100.    100.      0.
 34           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 35           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 36           KK     7R1
 37           RS       2    FLOW      -1
 38           RL                      1     100
 39           RC     .05     .05     .05    5531   .0108     105
 40           RX       0     100    1259    1426    1592    1759    2917    3017
 41           RY     106     104     102   100.1     100     102     104     106

 42           KK     702
 43           KM   SUB-BASIN 702
 44           BA    4.32
 45           LG     .33     .27    6.70     .21    9.00
 46           UI    303.   1083.   1702.   2357.   3598.   2722.   1977.   1357.    646.    426.
 47           UI    247.     93.     93.     93.      0.      0.      0.      0.      0.      0.
 48           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 49           KK     7C1
 50           HC       2

 51           KK     7R2
 52           RS       2    FLOW      -1
 53           RL                      1     100
 54           RC     .05     .05     .05    6034   .0066     105
 55           RX       0     100     931    1064    1198    1331    2162    2262
 56           RY     106     104     102   100.1     100     102     104     106

 57           KK     703
 58           KM   SUB-BASIN 703
 59           BA    2.73
 60           LG     .30     .26    7.40     .18   10.00
 61           UI    118.    173.    447.    596.    713.    870.   1174.   1462.   1154.    950.
 62           UI    773.    627.    485.    279.    202.    167.    118.     72.     36.     36.
 63           UI     36.     36.     36.      0.      0.      0.      0.      0.      0.      0.
 64           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 65           KK     CD1          COMBINE FLOW PRIOR TO DIVERSION
 66           HC       2

 67           KK      D1
 68           KM            DIVERT FLOWS FROM BASIN 7 TO BASIN 8
 69           DT    DIV1
 70           DI       0      36      66     200    1600    2400    5000    8900
 71           DQ       0       0       0      40     240     460    1000    1800

 72           KK     7R3
 73           RS       2    FLOW      -1
 74           RL                      1     100
 75           RC     .05     .05     .05    6537   .0153     105
 76           RX       0     100    1308    1441    1575    1708    2917    3017
 77           RY     106     104     102   100.1     100     102     104     106

 78           KK     704
 79           KM   SUB-BASIN 704
 80           BA    3.25
 81           LG     .28     .27    7.20     .20   12.00
 82           UI    249.    997.   1499.   2266.   2805.   1907.   1326.    688.    387.    221.
 83           UI     76.     76.     76.      0.      0.      0.      0.      0.      0.      0.
 84           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 85           KK     7C2
 86           HC       2

 87           KK     7R4
 88           RS       6    FLOW      -1
 89           RL                      1     100
 90           RC     .05     .05     .05   17600   .0153     105
 91           RX       0     100    1973    2501    3029    3557    5431    5531
 92           RY     106     104     102   100.1     100     102     104     106
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 93         KK     705
 94         KM   SUB-BASIN 705
 95         BA    3.71
 96         LG     .34     .30    4.50     .29    2.00
 97         UI    181.    351.    766.    993.   1231.   1605.   2245.   1781.   1426.   1129.
 98         UI    890.    590.    317.    278.    181.    109.     55.     55.     55.     55.
 99         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
100         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

101         KK     CD5          COMBINE FLOWS PRIOR TO DIVERSION
102         HC       2

103         KK      D5          DIVERSION @ SR 85, 705 TO 706 & 707
104         DT    DIV5
105         DI       0     100     200     500    1000    2500    5000
106         DQ       0      27      55     135     270     680    1360
            *  END OF MODEL STUB NEEDED TO GET DIVERSION FLOWS FROM BASIN 7
            *

107         KK     RD5
108         KM            RETRIEVE FLOW FROM SUB-BASIN 705
109         DR    DIV5

110         KK     7R6
111         RS       2    FLOW      -1
112         RL                       1     100
113         RC     .05     .05     .05    6034   .0149     105
114         RX       0     100    1490    1670    1850    2030    3420    3520
115         RY     106     104     102   100.1   100.1     102     104     106

116         KK     707
117         KM   SUB-BASIN 707
118         BA     .64
119         LG     .39     .34    4.20     .42     .00
120         UI    127.    391.    721:    633.    365.    140.     58.     22.      0.      0.
121         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

122         KK     7C5
123         KM            COMBINE FLOWS AT CANAL SOUTH OF SKI LAKE
124         HC       2
            *  BASIN NO. 8

125         KK     801
126         KM   SUB-BASIN 801
127         BA    3.38
128         LG     .26     .24    8.20     .12   12.00
129         UI    170.    170.    337.    619.    800.    919.   1035.   1192.   1372.   1790.
130         UI   2160.   1872.   1576.   1384.   1209.   1039.    895.    771.    568.    373.
131         UI    297.    279.    214.    170.    166.     52.     52.     52.     52.     52.
132         UI     52.     52.     52.      0.      0.      0.      0.      0.      0.      0.
133         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 134          KK    8R1
 135          RS      1    FLOW     -1
 136          RL                    10     100
 137          RC    .05     .05     .05    4724   .0269     105
 138          RX      0     100     350     450     550     650     900    1000
 139          RY    106     104     102   100.1     100     102     104     106

 140          KK    802
 141          KM   SUB-BASIN 802
 142          BA   1.38
 143          LG    .26     .24    8.30     .10    9.00
 144          UI   150.    481.    797.   1061.   1655.   1558.   1135.    831.    534.    258.
 145          UI   185.    103.     46.     46.     46.      0.      0.      0.      0.      0.
 146          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 147          KK    8C1
 148          HC      2

 149          KK    8R2
 150          RS      1    FLOW     -1
 151          RL                    10     100
 152          RC    .05     .05     .05    4274   .0246     105
 153          RX      0     100     401     467     533     599     900    1000
 154          RY    106     104     102   100.1     100     102     104     106

 155          KK    803
 156          KM   SUB-BASIN 803
 157          BA   3.05
 158          LG    .31     .26    6.90     .17    7.00
 159          UI   156.    156.    323.    576.    738.    853.    960.   1111.   1288.   1678.
 160          UI  2004.   1655.   1404.   1241.   1065.    929.    787.    663.    480.    292.
 161          UI   266.    256.    162.    156.    112.     48.     48.     48.     48.     48.
 162          UI    48.     48.      0.      0.      0.      0.      0.      0.      0.      0.
 163          UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 164          KK    RD1
 165          KM          RETRIEVE DIVERTED FLOW FROM BASIN 7
 166          DR   DIV1

 167          KK    8R3
 168          RS      4    FLOW     -1
 169          RL                    10    1119
 170          RC    .05     .05     .05   10308   .0116    1200
 171          RX      0     200    1700    1701    1899    1900    4200    4700
 172          RY   1200    1160    1120  1119.1    1119    1120    1160    1200

 173          KK    8C2
 174          HC      3
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 175          KK     8R4
 176          RS       2    FLOW      -1
 177          RL                     10     100
 178          RC     .05     .05     .05    7040   .0114     105
 179          RX       0     100    1390    1720    2050    2380    3671    3771
 180          RY     106     104     102   100.1     100     102     104     106

 181          KK     804
 182          KM   SUB-BASIN 804
 183          BA    5.64
 184          LG     .30     .27    6.50     .22   10.00
 185          UI    311.    311.    782.   1266.   1558.   1795.   2067.   2421.   3127.   3932.
 186          UI   3412.   2833.   2475.   2101.   1793.   1523.   1198.    774.    550.    511.
 187          UI    390.    311.    254.     95.     95.     95.     95.     95.     95.     95.
 188          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 189          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 190          KK     8C3
 191          HC       2

 192          KK     8R5
 193          RS       1    FLOW      -1
 194          RL                     10     100
 195          RC     .05     .05     .05    2765   .0145     105
 196          RX       0     100     959    1157    1355    1553    2413    2514
 197          RY     106     104     102   100.1     100     102     104     106

 198          KK     805
 199          KM   SUB-BASIN 805
 200          BA    1.62
 201          LG     .28     .24    8.20     .11   13.00
 202          UI    134.    265.    573.    742.    921.   1223.   1656.   1294.   1038.    819.
 203          UI    639.    405.    233.    195.    134.     67.     41.     41.     41.     41.
 204          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 205          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 206          KK     8C4
 207          HC       2

 208          KK     8R6
 209          RS       3    FLOW      -1
 210          RL                     10     100
 211          RC     .05     .05     .05    8045   .0099     105
 212          RX       0     100    1309    1526    1742    1959    3168    3268
 213          RY     106     104     102   100.1     100     102     104     106

 214          KK     806
 215          KM   SUB-BASIN 806
 216          BA     .47
 217          LG     .34     .31    4.40     .31    1.00
 218          UI      33.     45.    122.    164.    196.    237.    305.    415.    340.    277.
 219          UI    229.    187.    149.     99.     58.     54.     34.     30.     10.     10.
 220          UI     10.     10.     10.      0.      0.      0.      0.      0.      0.      0.
 221          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 222          KK     CD2
 223          HC       2

 224          KK      D2
 225          KM              DIVERT FLOWS FROM BASIN 8 TO BASIN 9
 226          DT    DIV2
 227          DI    5500    6730    8350   13460   24200
 228          DQ       0     400    1050    1900    3300

 229          KK     8R7
 230          RS       2    FLOW      -1
 231          RL                     10     100
 232          RC     .05     .05     .05    6034   .0133     105
 233          RX       0     100    2415    2648    2881    3115    5431    5531
 234          RY     106     104     102   100.1     100     102     104     106

 235          KK     807
 236          KM   SUB-BASIN 807
 237          BA    2.54
 238          LG     .33     .27    5.70     .21    5.00
 239          UI    143.    143.    371.    590.    721.    833.    965.   1128.   1492.   1811.
 240          UI   1503.   1261.   1099.    926.    792.    671.    486.    309.    246.    234.
 241          UI    148.    143.     79.     44.     44.     44.     44.     44.     44.      0.
 242          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 243          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 244          KK     8C5
 245          HC       2

 246          KK     8R8
 247          RS       1    FLOW      -1
 248          RL                     10     100
 249          RC     .05     .05     .05    4274   .0112     105
 250          RX       0     100     755     922    1089    1255    1911    2011
 251          RY     106     104     102   100.1     100     102     104     106

 252          KK     808
 253          KM   SUB-BASIN 808
 254          BA     .31
 255          LG     .35     .31    3.80     .32     .00
 256          UI     64.    220.    341.    542.    377.    242.    105.     58.     21.     15.
 257          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 258          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 259          KK     8C6
 260          KM              COMBINE BASIN 8 FLOWS AT CANAL BERM
 261          HC       2

 262          KK   D8NRTH
 263          KM            SPLIT BASIN 8 FLOW TO NORTH
 264          DT   D8STH
 265          DI       0     210     425     899    1392    1951    2665    3367    4288    5666
 266          DI    7380
 267          DQ       0       0       7     200     336     484     645     807    1030    1350
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LINE        ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 268        DQ    1867

 269        KK  D8NRTH
 270        KM     SOME OF THE NORTHWARD FLOW IS DIVERTED THRU THE PUMP SPILLWAY
 271        DT  PSPILL
 272        DI       0      11      73     210     418     699    1056    1467    2020    2560
 273        DI    3258    4316    5513
 274        DQ       0      10      54     129     239     385     570     796    1067    1384
 275        DQ    1749    2166    2635
            *    COMBINE REMAINING NORTHWARD FLOW WITH PORTION OF BASIN 7

 276        KK   7CMB8
 277        KM       COMBINE NORTHWARD FLOW FROM BASIN 8 WITH 7C5
 278        HC       2

 279        KK  BERMOT
 280        KM      STORAGE ROUTE THROUGH FOUR 30 INCH SPILLTOS PLUS BERM OT
 281        KO       2
 282        RS       1    ELEV   742.5
 283        SV       0       2    10.1    25.7    48.8
 284        SE     742     744     746     748     750
 285        SQ       0       4      29      69      81      91     510    2437    5068
 286        SE     745     746     747     748   748.4   748.5     749     750     751
            * RETRIEVE DIVERTED FLOW FROM BASIN 8 (FLOW TO SOUTH)

 287        KK   FLW8S
 288        KM   SOUTHWARD BASIN 8 FLOW
 289        DR   D8STH

 290        KK   CHAN9
 291        KM       ROUTE THROUGH DEEP CHANNEL IN BASIN 9
            * KO     1
 292        RS       2    FLOW      -1
 293        SV       0      35      57      93     132     184     223     268     293
 294        SQ       0     200     400     800    1200    1600    2000    2400    2800
            *  BASIN NO. 9

 295        KK     901
 296        KM   SUB-BASIN 901
 297        BA    2.25
 298        LG     .35     .29    3.80     .27    1.00
 299        UI    135.    379.    683.    884.   1253.   1608.   1185.    901.    670.    383.
 300        UI    230.    156.     90.     41.     41.     41.      0.      0.      0.      0.
 301        UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 302        KK     RD2
 303        KM            RETRIEVE FLOW FROM BASIN 8 DIVERSION
 304        DR    DIV2

 305        KK     9R1
 306        RS       2    FLOW      -1
 307        RL                       5     100
 308        RC     .05     .05     .05    6285   .0127     105
 309        RX       0     100    1740    2090    2440    2790    4440    4540
 310        RY     106     104     102   100.1     100     102     104     106
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

311           KK    9C1
312           HC      2
              * ROUTE TO CANAL BERM

313           KK    9R2
314           RS      2    FLOW     -1
315           RL                     5     100
316           RC    .05     .05     .05    5030   .0119     105
317           RX      0     100    1812    2112    2412    2712    4425    4525
318           RY    106     104     102   100.1     100     102     104     106

319           KK    902
320           KM   SUB-BASIN 902
321           BA   1.26
322           LG    .35     .30    3.60     .29     .00
323           UI   249.    770.   1420.   1246.    718.    276.    114.     43.      0.      0.
324           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

325           KK    9C2
326           KM           COMBINE FLOWS AT CANAL
327           HC      2
              *  BASIN NO. 10

328           KK   1001
329           KM   SUB-BASIN 1001
330           BA   4.63
331           LG    .30     .25    7.60     .11    6.00
332           UI   205.    205.    246.    696.    855.   1012.   1142.   1266.   1438.   1621.
333           UI  1973.   2536.   2522.   2093.   1827.   1641.   1449.   1267.   1117.    979.
334           UI   816.    587.    363.    353.    337.    259.    205.    205.    109.     63.
335           UI    63.     63.     63.     63.     63.     63.     63.      0.      0.      0.
336           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

337           KK   1002
338           KM   SUB-BASIN 1002
339           BA   4.49
340           LG    .32     .28    5.90     .18    3.00
341           UI  0240.    240.    561.    941.   1175.   1353.   1544.   1799.   2188.   2927.
342           UI  2854.   2319.   2005.   1746.   1486.   1268.   1076.    779.    485.    412.
343           UI   394.    250.    240.    153.     74.     74.     74.     74.     74.     74.
344           UI    74.      0.      0.      0.      0.      0.      0.      0.      0.      0.
345           UI     0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

346           KK   10C1
347           HC      2

348           KK   10R1
349           RS      3    FLOW     -1
350           RL                    10     100
351           RC    .05     .05     .05    8548   .0099     105
352           RX      0     100    1943    2240    2537    2834    4677    4777
353           RY    106     104     102   100.1     100     102     104     106
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

354           KK    1003
355           KM   SUB-BASIN 1003
356           BA     .29
357           LG     .35     .31    3.80     .33     .00
358           UI    225.    711.    637.    222.     52.      0.      0.      0.      0.      0.
359           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

360           KK    10C2
361           KM        TOTAL FLOW FOR BASIN 10
362           HC       2

363           KK   CMB10
364           KM        COMBINE BASINS 8, 9 & 10 AT CANAL - SIPHON 5
365           HC       3

366           KK   SPWY5
367           KO       1
368           KM       STORAGE ROUTE IN STORAGE AREAS 9, 10 & 11 THRU SPILLWAY AT SIPHON 5
369           RS       1    ELEV     737
370           SV       0     5.0    11.1    54.9     138     278     486     753
371           SE   738.5     739     740     742     744     746     748     750
372           SQ       0     110     583    1275    2147    3181    4368    5700    7175    8790
373           SE   738.5     739     740     741     742     743     744     745     746     747
              *  FLOW GETS DIVERTED FROM SIPHON 5 OUT OF WATERSHED
374           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

 28         701
             V
             V
 36         7R1
             .
             .
 42          .         702
             .           .
             .           .
 49         7C1............
             V
             V
 51         7R2
             .
             .
 57          .         703
             .           .
             .           .
 65         CD1............
             .
             .
 69          .------->    DIV1
 67         D1
             V
             V
 72         7R3
             .
             .
 78          .         704
             .           .
             .           .
 85         7C2............
             V
             V
 87         7R4
             .
             .
 93          .         705
             .           .
             .           .
101         CD5............
             .
             .
104          .------->    DIV5
103         D5
             .
             .
109          .           .<-------    DIV5
107          .         RD5
             .           V
             .           V
110          .         7R6
             .           .
```

```
116                 707
                     .
                     .
122             7C5............
                     .
                     .
125                 801
                     V
                     V
134                 8R1
                     .
                     .
140                 .        802
                    .          .
                    .          .
147                 8C1............
                     V
                     V
149                 8R2
                     .
                     .
155                 .        803
                    .          .
                    .          .
166                 .          .          .<-------    DIV1
164                 .          .        RD1
                    .          .          V
                    .          .          V
167                 .          .        8R3
                    .          .          .
                    .          .          .
173                 8C2........................
                     V
                     V
175                 8R4
                     .
                     .
181                 .        804
                    .          .
                    .          .
190                 8C3............
                     V
                     V
192                 8R5
                     .
                     .
198                 .        805
                    .          .
                    .          .
206                 8C4............
                     V
                     V
208                 8R6
                     .
                     .
214                 .        806
                    .          .
                    .          .
222                 CD2............
```

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                .          .          .
                .          .          .
226             .          .          .-------->   DIV2
224             .          .        D2
                .          .         V
                .          .         V
229             .          .       8R7
                .          .          .
                .          .          .
235             .          .          .        807
                .          .          .          .
                .          .          .          .
244             .          .       8C5............
                .          .         V
                .          .         V
246             .          .       8R8
                .          .          .
                .          .          .
252             .          .          .        808
                .          .          .          .
                .          .          .          .
259             .          .       8C6............
                .          .          .
                .          .          .
264             .          .          .-------->   D8STH
262             .          .    D8NRTH
                .          .          .
                .          .          .
271             .          .          .-------->  PSPILL
269             .          .    D8NRTH
                .          .          .
                .          .          .
276             .     7CM88............
                .         V
                .         V
279             .    BERMOT
                .         .
                .         .
289             .          .          .<--------   D8STH
287             .          .     FLW8S
                .          .         V
                .          .         V
290             .          .     CHAN9
                .          .          .
                .          .          .
295             .          .          .        901
                .          .          .          .
                .          .          .          .
304             .          .          .          .          .<--------    DIV2
302             .          .          .          .        RD2
                .          .          .          .         V
                .          .          .          .         V
305             .          .          .          .        9R1
                .          .          .          .          .
                .          .          .          .          .
311             .          .          .        9C1............
                .          .          .          V
                .          .          .          V
313             .          .          .        9R2
                .          .          .          .
```

```
319                                  902
                                      .
                                      .
325                            9C2............
                                      .
                                      .
328                                  1001
                                      .
                                      .
337                                      .        1002
                                      .           .
                                      .           .
346                                  10C1...........
                                        V
                                        V
348                                  10R1
                                      .
                                      .
354                                      .        1003
                                      .           .
                                      .           .
360                                  10C2...........
                                      .
                                      .
363                        CMB10......................
                                V
                                V
366                        SPWY5
```

*) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  11/17/1991  TIME  13:14:40 *
*                                      *
****************************************
```

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

PROJECT: GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DONOHUE PROJECT NO: 18099
DATE: 11/10/91
FILENAME: SKILKS.HC1 BASINS 7(PART) AND 8 - 10
RUN DESCRIPTION:
STORM EVENT: 100-YR
STORM DURATION: 24-HR
COMBINED RATING CURVES FOR FLOW OVER SPILLWAYS, CANAL BERM, LOW LEVEL OUTLETS (SPILL-TOs, SPILL-UNDERS etc.), AND CONTROL-SECTIONS (OVERFLOW TO NEXT DOWNSTREAM BASIN), WERE USED FOR THE ROUTINGS THROUGH PONDING AREAS ADJACENT TO THE CANAL.
AREA SOUTH OF SKI LAKE SOUTH TO SIPHON SPILLWAY

```
15 IO        OUTPUT CONTROL VARIABLES
                  IPRNT          5  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                   NMIN         10  MINUTES IN COMPUTATION INTERVAL
                  IDATE      1    0  STARTING DATE
                  ITIME       0000  STARTING TIME
                     NQ        145  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE      2    0  ENDING DATE
                 NDTIME       0000  ENDING TIME
                  ICENT         19  CENTURY MARK

            COMPUTATION INTERVAL     .17 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

17 JD        INDEX STORM NO. 1
                  STRM        4.20  PRECIPITATION DEPTH
                  TRDA         .01  TRANSPOSITION DRAINAGE AREA
```

18 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

23 JD INDEX STORM NO. 2

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

24 JD INDEX STORM NO. 3

STRM 3.86 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

25 JD INDEX STORM NO. 4

STRM 3.78 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

26 JD INDEX STORM NO. 5

STRM 3.70 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

27 JD INDEX STORM NO. 6

STRM 3.57 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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

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                .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                .00       .00       .00       .00

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


          **************
          *            *
279 KK    *   BERMOT   *
          *            *
          **************

281 KO         OUTPUT CONTROL VARIABLES
                    IPRNT           2  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

            HYDROGRAPH ROUTING DATA

248 RL         ROUTING LOSSES
                    QLOSS         .00  INITIAL LOSS
                    CLOSS         .00  ADDITIONAL FRACTION LOST

282 RS         STORAGE ROUTING
                    NSTPS           1  NUMBER OF SUBREACHES
                     ITYP        ELEV  TYPE OF INITIAL CONDITION
                   RSVRIC      742.50  INITIAL CONDITION
                        X         .00 WORKING R AND D COEFFICIENT

283 SV           STORAGE          .0       2.0      10.1      25.7      48.8

284 SE         ELEVATION      742.00    744.00    746.00    748.00    750.00

285 SQ         DISCHARGE          0.        4.       29.       69.       81.       91.      510.     2437.     5068.

286 SE         ELEVATION      745.00    746.00    747.00    748.00    748.40    748.50    749.00    750.00    751.00

                                                                  ***

                                                COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00      2.00      6.05     10.10     17.90     25.70     30.32     31.48     37.25     48.80
          OUTFLOW        .00       .00       .00      4.00     29.00     69.00     81.00     91.00    510.00   2437.00
        ELEVATION     742.00    744.00    745.00    746.00    747.00    748.00    748.40    748.50    749.00    750.00

          STORAGE      60.35
          OUTFLOW    5068.00
        ELEVATION     751.00

*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN      510. TO     5068.
                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   BERMOT
                    TRANSPOSITION AREA       .0 SQ MI
```

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3582.	14.50	(CFS)	1524.	393.	393.	393.
		(INCHES)	.744	.769	.769	.769
		(AC-FT)	756.	780.	780.	780.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
54.	14.50	42.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.44	14.50	749.44	745.54	745.54	745.54

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION BERMOT
TRANSPOSITION AREA 10.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3270.	14.50	(CFS)	1363.	353.	353.	353.
		(INCHES)	.666	.690	.690	.690
		(AC-FT)	676.	700.	700.	700.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
52.	14.50	41.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.32	14.50	749.36	745.51	745.51	745.51

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION BERMOT
TRANSPOSITION AREA 20.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3058.	14.67	(CFS)	1263.	328.	328.	328.
		(INCHES)	.617	.640	.640	.640
		(AC-FT)	626.	650.	650.	650.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
52.	14.67	41.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.24	14.67	749.31	745.49	745.49	745.49

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION BERMOT
TRANSPOSITION AREA 30.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
2928.	14.67	(CFS)	1202.	312.	312.	312.
		(INCHES)	.587	.610	.610	.610
		(AC-FT)	596.	620.	620.	620.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
51.	14.67	41.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.19	14.67	749.28	745.48	745.48	745.48

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION BERMOT
TRANSPOSITION AREA 50.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
2796.	14.67	(CFS)	1142.	297.	297.	297.
		(INCHES)	.558	.581	.581	.581
		(AC-FT)	566.	589.	589.	589.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
50.	14.67	40.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.14	14.67	749.25	745.46	745.46	745.46

CUMULATIVE AREA = 19.03 SQ MI

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

HYDROGRAPH AT STATION BERMOT
TRANSPOSITION AREA 100.0 SQ MI

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
2563.	14.67	(CFS)	1045.	273.	273.	273.
		(INCHES)	.510	.533	.533	.533
		(AC-FT)	518.	541.	541.	541.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
49.	14.67	40.	15.	15.	15.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
750.05	14.67	749.20	745.44	745.44	745.44

CUMULATIVE AREA = 19.03 SQ MI

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INTERPOLATED HYDROGRAPH AT BERMOT

****

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0610	38	0.	1		1220	75	66.	1		1830	112	86.
1		0010	2	0.	1		0620	39	0.	1		1230	76	217.	1		1840	113	83.
1		0020	3	0.	1		0630	40	0.	1		1240	77	491.	1		1850	114	80.
1		0030	4	0.	1		0640	41	0.	1		1250	78	567.	1		1900	115	79.
1		0040	5	0.	1		0650	42	0.	1		1300	79	632.	1		1910	116	78.
1		0050	6	0.	1		0700	43	0.	1		1310	80	787.	1		1920	117	76.
1		0100	7	0.	1		0710	44	0.	1		1320	81	1035.	1		1930	118	75.
1		0110	8	0.	1		0720	45	0.	1		1330	82	1386.	1		1940	119	73.
1		0120	9	0.	1		0730	46	0.	1		1340	83	1769.	1		1950	120	71.
1		0130	10	0.	1		0740	47	0.	1		1350	84	2121.	1		2000	121	69.
1		0140	11	0.	1		0750	48	0.	1		1400	85	2459.	1		2010	122	66.
1		0150	12	0.	1		0800	49	0.	1		1410	86	2784.	1		2020	123	62.
1		0200	13	0.	1		0810	50	0.	1		1420	87	2970.	1		2030	124	59.
1		0210	14	0.	1		0820	51	0.	1		1430	88	3073.	1		2040	125	55.
1		0220	15	0.	1		0830	52	0.	1		1440	89	3073.	1		2050	126	52.
1		0230	16	0.	1		0840	53	0.	1		1450	90	2987.	1		2100	127	49.
1		0240	17	0.	1		0850	54	0.	1		1500	91	2826.	1		2110	128	46.
1		0250	18	0.	1		0900	55	0.	1		1510	92	2595.	1		2120	129	43.
1		0300	19	0.	1		0910	56	0.	1		1520	93	2336.	1		2130	130	40.
1		0310	20	0.	1		0920	57	0.	1		1530	94	2062.	1		2140	131	38.
1		0320	21	0.	1		0930	58	0.	1		1540	95	1761.	1		2150	132	35.
1		0330	22	0.	1		0940	59	0.	1		1550	96	1463.	1		2200	133	33.
1		0340	23	0.	1		0950	60	0.	1		1600	97	1198.	1		2210	134	31.
1		0350	24	0.	1		1000	61	0.	1		1610	98	988.	1		2220	135	29.
1		0400	25	0.	1		1010	62	0.	1		1620	99	811.	1		2230	136	28.
1		0410	26	0.	1		1020	63	0.	1		1630	100	668.	1		2240	137	26.
1		0420	27	0.	1		1030	64	0.	1		1640	101	549.	1		2250	138	25.
1		0430	28	0.	1		1040	65	0.	1		1650	102	460.	1		2300	139	24.
1		0440	29	0.	1		1050	66	0.	1		1700	103	370.	1		2310	140	23.
1		0450	30	0.	1		1100	67	0.	1		1710	104	285.	1		2320	141	22.
1		0500	31	0.	1		1110	68	0.	1		1720	105	225.	1		2330	142	21.
1		0510	32	0.	1		1120	69	0.	1		1730	106	186.	1		2340	143	20.
1		0520	33	0.	1		1130	70	0.	1		1740	107	158.	1		2350	144	19.
1		0530	34	0.	1		1140	71	0.	1		1750	108	135.	2		0000	145	19.
1		0540	35	0.	1		1150	72	0.	1		1800	109	115.					
1		0550	36	0.	1		1200	73	1.	1		1810	110	97.					
1		0600	37	0.	1		1210	74	20.	1		1820	111	89.					

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3073.	14.67	(CFS)	1270.	329.	329.	329.
		(INCHES)	.620	.644	.644	.644
		(AC-FT)	630.	653.	653.	653.

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                    CUMULATIVE AREA =   19.03 SQ MI

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          *            *
366 KK    *     SPWY5  *
          *            *
          **************

367 KO         OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE
                            STORAGE ROUTE IN STORAGE AREAS 9, 10 & 11 THRU SPILLWAY AT SIPHON 5

            HYDROGRAPH ROUTING DATA

350 RL         ROUTING LOSSES
                     QLOSS        .00  INITIAL LOSS
                     CLOSS        .00  ADDITIONAL FRACTION LOST

369 RS         STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       ELEV  TYPE OF INITIAL CONDITION
                    RSVRIC     737.00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

370 SV           STORAGE        .0      5.0     11.1     54.9    138.0    278.0    486.0    753.0

371 SE         ELEVATION     738.50   739.00   740.00   742.00   744.00   746.00   748.00   750.00

372 SQ         DISCHARGE        0.      110.     583.    1275.    2147.    3181.    4368.    5700.    7175.    8790.

373 SE         ELEVATION     738.50   739.00   740.00   741.00   742.00   743.00   744.00   745.00   746.00   747.00

                                                  ***

                                   COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE       .00     5.00    11.10    33.00    54.90    96.45   138.00   208.00   278.00   382.00
          OUTFLOW       .00   110.00   583.00  1275.00  2147.00  3181.00  4368.00  5700.00  7175.00  8790.00
        ELEVATION    738.50   739.00   740.00   741.00   742.00   743.00   744.00   745.00   746.00   747.00

          STORAGE    486.00   753.00
          OUTFLOW  10405.00 13635.00
        ELEVATION    748.00   750.00

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                                   HYDROGRAPH AT     SPWY5
                                TRANSPOSITION AREA      .0 SQ MI
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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	1		0810	50	0.	.0	738.5	1		1620	99	2175.	56.0	742.0
1		0010	2	0.	.0	738.5	1		0820	51	0.	.0	738.5	1		1630	100	1775.	45.6	741.6
1		0020	3	0.	.0	738.5	1		0830	52	0.	.0	738.5	1		1640	101	1444.	37.2	741.2
1		0030	4	0.	.0	738.5	1		0840	53	0.	.0	738.5	1		1650	102	1188.	30.3	740.9
1		0040	5	0.	.0	738.5	1		0850	54	0.	.0	738.5	1		1700	103	993.	24.1	740.6
1		0050	6	0.	.0	738.5	1		0900	55	0.	.0	738.5	1		1710	104	827.	18.8	740.4
1		0100	7	0.	.0	738.5	1		0910	56	0.	.0	738.5	1		1720	105	690.	14.5	740.2
1		0110	8	0.	.0	738.5	1		0920	57	0.	.0	738.5	1		1730	106	573.	11.0	740.0
1		0120	9	0.	.0	738.5	1		0930	58	0.	.0	738.5	1		1740	107	401.	8.8	739.6
1		0130	10	0.	.0	738.5	1		0940	59	0.	.0	738.5	1		1750	108	318.	7.7	739.4
1		0140	11	0.	.0	738.5	1		0950	60	0.	.0	738.5	1		1800	109	266.	7.0	739.3
1		0150	12	0.	.0	738.5	1		1000	61	0.	.0	738.5	1		1810	110	227.	6.5	739.2
1		0200	13	0.	.0	738.5	1		1010	62	0.	.0	738.5	1		1820	111	199.	6.2	739.2
1		0210	14	0.	.0	738.5	1		1020	63	0.	.0	738.5	1		1830	112	179.	5.9	739.1
1		0220	15	0.	.0	738.5	1		1030	64	0.	.0	738.5	1		1840	113	161.	5.7	739.1
1		0230	16	0.	.0	738.5	1		1040	65	0.	.0	738.5	1		1850	114	145.	5.5	739.1
1		0240	17	0.	.0	738.5	1		1050	66	0.	.0	738.5	1		1900	115	131.	5.3	739.0
1		0250	18	0.	.0	738.5	1		1100	67	0.	.0	738.5	1		1910	116	117.	5.1	739.0
1		0300	19	0.	.0	738.5	1		1110	68	0.	.0	738.5	1		1920	117	108.	4.9	739.0
1		0310	20	0.	.0	738.5	1		1120	69	0.	.0	738.5	1		1930	118	103.	4.7	739.0
1		0320	21	0.	.0	738.5	1		1130	70	0.	.0	738.5	1		1940	119	97.	4.4	738.9
1		0330	22	0.	.0	738.5	1		1140	71	26.	1.2	738.6	1		1950	120	90.	4.1	738.9
1		0340	23	0.	.0	738.5	1		1150	72	222.	6.4	739.2	1		2000	121	83.	3.8	738.9
1		0350	24	0.	.0	738.5	1		1200	73	766.	16.9	740.3	1		2010	122	75.	3.4	738.8
1		0400	25	0.	.0	738.5	1		1210	74	1176.	29.9	740.9	1		2020	123	69.	3.1	738.8
1		0410	26	0.	.0	738.5	1		1220	75	1529.	39.4	741.3	1		2030	124	62.	2.8	738.8
1		0420	27	0.	.0	738.5	1		1230	76	1615.	41.5	741.4	1		2040	125	56.	2.5	738.8
1		0430	28	0.	.0	738.5	1		1240	77	1558.	40.1	741.3	1		2050	126	50.	2.3	738.7
1		0440	29	0.	.0	738.5	1		1250	78	1635.	42.1	741.4	1		2100	127	45.	2.0	738.7
1		0450	30	0.	.0	738.5	1		1300	79	1951.	50.0	741.8	1		2110	128	40.	1.8	738.7
1		0500	31	0.	.0	738.5	1		1310	80	2333.	62.4	742.2	1		2120	129	35.	1.6	738.7
1		0510	32	0.	.0	738.5	1		1320	81	2717.	77.8	742.6	1		2130	130	31.	1.4	738.6
1		0520	33	0.	.0	738.5	1		1330	82	3162.	95.7	743.0	1		2140	131	28.	1.3	738.6
1		0530	34	0.	.0	738.5	1		1340	83	3701.	114.6	743.4	1		2150	132	25.	1.1	738.6
1		0540	35	0.	.0	738.5	1		1350	84	4223.	132.9	743.9	1		2200	133	22.	1.0	738.6
1		0550	36	0.	.0	738.5	1		1400	85	4597.	150.0	744.2	1		2210	134	19.	.9	738.6
1		0600	37	0.	.0	738.5	1		1410	86	4887.	165.3	744.4	1		2220	135	17.	.8	738.6
1		0610	38	0.	.0	738.5	1		1420	87	5107.	176.8	744.6	1		2230	136	15.	.7	738.6
1		0620	39	0.	.0	738.5	1		1430	88	5225.	183.1	744.6	1		2240	137	13.	.6	738.6
1		0630	40	0.	.0	738.5	1		1440	89	5231.	183.4	744.6	1		2250	138	12.	.5	738.6
1		0640	41	0.	.0	738.5	1		1450	90	5127.	177.9	744.6	1		2300	139	10.	.5	738.5
1		0650	42	0.	.0	738.5	1		1500	91	4930.	167.5	744.4	1		2310	140	9.	.4	738.5
1		0700	43	0.	.0	738.5	1		1510	92	4670.	153.9	744.2	1		2320	141	8.	.4	738.5
1		0710	44	0.	.0	738.5	1		1520	93	4375.	138.4	744.0	1		2330	142	7.	.3	738.5
1		0720	45	0.	.0	738.5	1		1530	94	3930.	122.7	743.6	1		2340	143	6.	.3	738.5
1		0730	46	0.	.0	738.5	1		1540	95	3510.	108.0	743.3	1		2350	144	5.	.2	738.5
1		0740	47	0.	.0	738.5	1		1550	96	3123.	94.1	742.9	2		0000	145	5.	.2	738.5
1		0750	48	0.	.0	738.5	1		1600	97	2794.	80.9	742.6							
1		0800	49	0.	.0	738.5	1		1610	98	2476.	68.1	742.3							

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
5231.	14.67	(CFS)	2686.	691.	691.	691.
		(INCHES)	1.933	1.990	1.990	1.990

(AC-FT)	1332.	1371.	1371.	1371.	

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
183.	14.67	82.	21.	21.	21.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
744.65	14.67	742.32	739.53	739.53	739.53

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT SPWY5
TRANSPOSITION AREA 10.0 SQ MI

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	*	1		0810	50	0.	.0	738.5	*	1		1620	99	1852.	47.5	741.7
1		0010	2	0.	.0	738.5	*	1		0820	51	0.	.0	738.5	*	1		1630	100	1510.	38.9	741.3
1		0020	3	0.	.0	738.5	*	1		0830	52	0.	.0	738.5	*	1		1640	101	1237.	31.8	740.9
1		0030	4	0.	.0	738.5	*	1		0840	53	0.	.0	738.5	*	1		1650	102	1038.	25.5	740.7
1		0040	5	0.	.0	738.5	*	1		0850	54	0.	.0	738.5	*	1		1700	103	863.	20.0	740.4
1		0050	6	0.	.0	738.5	*	1		0900	55	0.	.0	738.5	*	1		1710	104	718.	15.4	740.2
1		0100	7	0.	.0	738.5	*	1		0910	56	0.	.0	738.5	*	1		1720	105	601.	11.7	740.0
1		0110	8	0.	.0	738.5	*	1		0920	57	0.	.0	738.5	*	1		1730	106	434.	9.2	739.7
1		0120	9	0.	.0	738.5	*	1		0930	58	0.	.0	738.5	*	1		1740	107	335.	7.9	739.5
1		0130	10	0.	.0	738.5	*	1		0940	59	0.	.0	738.5	*	1		1750	108	278.	7.2	739.4
1		0140	11	0.	.0	738.5	*	1		0950	60	0.	.0	738.5	*	1		1800	109	236.	6.6	739.3
1		0150	12	0.	.0	738.5	*	1		1000	61	0.	.0	738.5	*	1		1810	110	206.	6.2	739.2
1		0200	13	0.	.0	738.5	*	1		1010	62	0.	.0	738.5	*	1		1820	111	184.	6.0	739.2
1		0210	14	0.	.0	738.5	*	1		1020	63	0.	.0	738.5	*	1		1830	112	166.	5.7	739.1
1		0220	15	0.	.0	738.5	*	1		1030	64	0.	.0	738.5	*	1		1840	113	150.	5.5	739.1
1		0230	16	0.	.0	738.5	*	1		1040	65	0.	.0	738.5	*	1		1850	114	135.	5.3	739.1
1		0240	17	0.	.0	738.5	*	1		1050	66	0.	.0	738.5	*	1		1900	115	121.	5.1	739.0
1		0250	18	0.	.0	738.5	*	1		1100	67	0.	.0	738.5	*	1		1910	116	110.	5.0	739.0
1		0300	19	0.	.0	738.5	*	1		1110	68	0.	.0	738.5	*	1		1920	117	105.	4.8	739.0
1		0310	20	0.	.0	738.5	*	1		1120	69	0.	.0	738.5	*	1		1930	118	99.	4.5	739.0
1		0320	21	0.	.0	738.5	*	1		1130	70	0.	.0	738.5	*	1		1940	119	92.	4.2	738.9
1		0330	22	0.	.0	738.5	*	1		1140	71	24.	1.1	738.6	*	1		1950	120	85.	3.9	738.9
1		0340	23	0.	.0	738.5	*	1		1150	72	192.	6.1	739.2	*	1		2000	121	78.	3.5	738.9
1		0350	24	0.	.0	738.5	*	1		1200	73	729.	15.7	740.2	*	1		2010	122	71.	3.2	738.8
1		0400	25	0.	.0	738.5	*	1		1210	74	1103.	27.6	740.8	*	1		2020	123	64.	2.9	738.8
1		0410	26	0.	.0	738.5	*	1		1220	75	1406.	36.3	741.1	*	1		2030	124	58.	2.6	738.8
1		0420	27	0.	.0	738.5	*	1		1230	76	1478.	38.1	741.2	*	1		2040	125	52.	2.4	738.7
1		0430	28	0.	.0	738.5	*	1		1240	77	1400.	36.1	741.1	*	1		2050	126	46.	2.1	738.7
1		0440	29	0.	.0	738.5	*	1		1250	78	1437.	37.1	741.2	*	1		2100	127	41.	1.9	738.7
1		0450	30	0.	.0	738.5	*	1		1300	79	1703.	43.8	741.5	*	1		2110	128	37.	1.7	738.7
1		0500	31	0.	.0	738.5	*	1		1310	80	2123.	54.3	742.0	*	1		2120	129	33.	1.5	738.6
1		0510	32	0.	.0	738.5	*	1		1320	81	2460.	67.5	742.3	*	1		2130	130	29.	1.3	738.6
1		0520	33	0.	.0	738.5	*	1		1330	82	2853.	83.3	742.7	*	1		2140	131	26.	1.2	738.6
1		0530	34	0.	.0	738.5	*	1		1340	83	3307.	100.9	743.1	*	1		2150	132	23.	1.0	738.6
1		0540	35	0.	.0	738.5	*	1		1350	84	3811.	118.5	743.5	*	1		2200	133	20.	.9	738.6
1		0550	36	0.	.0	738.5	*	1		1400	85	4257.	134.1	743.9	*	1		2210	134	18.	.8	738.6
1		0600	37	0.	.0	738.5	*	1		1410	86	4539.	147.0	744.1	*	1		2220	135	16.	.7	738.6
1		0610	38	0.	.0	738.5	*	1		1420	87	4716.	156.3	744.3	*	1		2230	136	14.	.6	738.6

1	0620	39	0.	.0	738.5	*	1	1430	88	4802.	160.8	744.3	*	1	2240	137	12.	.5	738.6
1	0630	40	0.	.0	738.5	*	1	1440	89	4788.	160.1	744.3	*	1	2250	138	11.	.5	738.5
1	0640	41	0.	.0	738.5	*	1	1450	90	4676.	154.2	744.2	*	1	2300	139	9.	.4	738.5
1	0650	42	0.	.0	738.5	*	1	1500	91	4490.	144.4	744.1	*	1	2310	140	8.	.4	738.5
1	0700	43	0.	.0	738.5	*	1	1510	92	4204.	132.3	743.9	*	1	2320	141	7.	.3	738.5
1	0710	44	0.	.0	738.5	*	1	1520	93	3837.	119.4	743.6	*	1	2330	142	6.	.3	738.5
1	0720	45	0.	.0	738.5	*	1	1530	94	3474.	106.7	743.2	*	1	2340	143	5.	.2	738.5
1	0730	46	0.	.0	738.5	*	1	1540	95	3127.	94.3	742.9	*	1	2350	144	5.	.2	738.5
1	0740	47	0.	.0	738.5	*	1	1550	96	2821.	82.0	742.7	*	2	0000	145	4.	.2	738.5
1	0750	48	0.	.0	738.5	*	1	1600	97	2518.	69.8	742.4	*						
1	0800	49	0.	.0	738.5	*	1	1610	98	2225.	58.0	742.1	*						
						*							*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4802.	14.50	(CFS)	2420.	623.	623.	623.
		(INCHES)	1.741	1.794	1.794	1.794
		(AC-FT)	1200.	1236.	1236.	1236.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
161.	14.50	72.	19.	19.	19.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
744.33	14.50	742.06	739.46	739.46	739.46

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT SPWY5
TRANSPOSITION AREA 20.0 SQ MI

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	*	1		0810	50	0.	.0	738.5	*	1		1620	99	1665.	42.8	741.4
1		0010	2	0.	.0	738.5	*	1		0820	51	0.	.0	738.5	*	1		1630	100	1362.	35.2	741.1
1		0020	3	0.	.0	738.5	*	1		0830	52	0.	.0	738.5	*	1		1640	101	1136.	28.6	740.8
1		0030	4	0.	.0	738.5	*	1		0840	53	0.	.0	738.5	*	1		1650	102	947.	22.6	740.5
1		0040	5	0.	.0	738.5	*	1		0850	54	0.	.0	738.5	*	1		1700	103	785.	17.5	740.3
1		0050	6	0.	.0	738.5	*	1		0900	55	0.	.0	738.5	*	1		1710	104	654.	13.3	740.1
1		0100	7	0.	.0	738.5	*	1		0910	56	0.	.0	738.5	*	1		1720	105	517.	10.2	739.9
1		0110	8	0.	.0	738.5	*	1		0920	57	0.	.0	738.5	*	1		1730	106	375.	8.4	739.6
1		0120	9	0.	.0	738.5	*	1		0930	58	0.	.0	738.5	*	1		1740	107	303.	7.5	739.4
1		0130	10	0.	.0	738.5	*	1		0940	59	0.	.0	738.5	*	1		1750	108	256.	6.9	739.3
1		0140	11	0.	.0	738.5	*	1		0950	60	0.	.0	738.5	*	1		1800	109	221.	6.4	739.2
1		0150	12	0.	.0	738.5	*	1		1000	61	0.	.0	738.5	*	1		1810	110	195.	6.1	739.2
1		0200	13	0.	.0	738.5	*	1		1010	62	0.	.0	738.5	*	1		1820	111	175.	5.8	739.1
1		0210	14	0.	.0	738.5	*	1		1020	63	0.	.0	738.5	*	1		1830	112	158.	5.6	739.1
1		0220	15	0.	.0	738.5	*	1		1030	64	0.	.0	738.5	*	1		1840	113	143.	5.4	739.1
1		0230	16	0.	.0	738.5	*	1		1040	65	0.	.0	738.5	*	1		1850	114	129.	5.2	739.0
1		0240	17	0.	.0	738.5	*	1		1050	66	0.	.0	738.5	*	1		1900	115	115.	5.1	739.0
1		0250	18	0.	.0	738.5	*	1		1100	67	0.	.0	738.5	*	1		1910	116	107.	4.9	739.0
1		0300	19	0.	.0	738.5	*	1		1110	68	0.	.0	738.5	*	1		1920	117	102.	4.6	739.0
1		0310	20	0.	.0	738.5	*	1		1120	69	0.	.0	738.5	*	1		1930	118	96.	4.4	738.9

1	0320	21	0.	.0	738.5	*	1	1130	70	0.	.0	738.5	*	1	1940	119	89.	4.0	738.9
1	0330	22	0.	.0	738.5	*	1	1140	71	23.	1.0	738.6	*	1	1950	120	82.	3.7	738.9
1	0340	23	0.	.0	738.5	*	1	1150	72	174.	5.8	739.1	*	1	2000	121	75.	3.4	738.8
1	0350	24	0.	.0	738.5	*	1	1200	73	706.	15.0	740.2	*	1	2010	122	68.	3.1	738.8
1	0400	25	0.	.0	738.5	*	1	1210	74	1058.	26.1	740.7	*	1	2020	123	61.	2.8	738.8
1	0410	26	0.	.0	738.5	*	1	1220	75	1329.	34.4	741.1	*	1	2030	124	55.	2.5	738.8
1	0420	27	0.	.0	738.5	*	1	1230	76	1395.	36.0	741.1	*	1	2040	125	49.	2.2	738.7
1	0430	28	0.	.0	738.5	*	1	1240	77	1307.	33.8	741.0	*	1	2050	126	44.	2.0	738.7
1	0440	29	0.	.0	738.5	*	1	1250	78	1320.	34.1	741.1	*	1	2100	127	39.	1.8	738.7
1	0450	30	0.	.0	738.5	*	1	1300	79	1556.	40.1	741.3	*	1	2110	128	35.	1.6	738.7
1	0500	31	0.	.0	738.5	*	1	1310	80	1946.	49.8	741.8	*	1	2120	129	31.	1.4	738.6
1	0510	32	0.	.0	738.5	*	1	1320	81	2321.	61.9	742.2	*	1	2130	130	28.	1.3	738.6
1	0520	33	0.	.0	738.5	*	1	1330	82	2677.	76.2	742.5	*	1	2140	131	24.	1.1	738.6
1	0530	34	0.	.0	738.5	*	1	1340	83	3088.	92.7	742.9	*	1	2150	132	22.	1.0	738.6
1	0540	35	0.	.0	738.5	*	1	1350	84	3561.	109.8	743.3	*	1	2200	133	19.	.9	738.6
1	0550	36	0.	.0	738.5	*	1	1400	85	3993.	124.9	743.7	*	1	2210	134	17.	.8	738.6
1	0600	37	0.	.0	738.5	*	1	1410	86	4330.	136.7	744.0	*	1	2220	135	15.	.7	738.6
1	0610	38	0.	.0	738.5	*	1	1420	87	4492.	144.5	744.1	*	1	2230	136	13.	.6	738.6
1	0620	39	0.	.0	738.5	*	1	1430	88	4555.	147.8	744.1	*	1	2240	137	11.	.5	738.6
1	0630	40	0.	.0	738.5	*	1	1440	89	4525.	146.2	744.1	*	1	2250	138	10.	.5	738.5
1	0640	41	0.	.0	738.5	*	1	1450	90	4410.	140.2	744.0	*	1	2300	139	9.	.4	738.5
1	0650	42	0.	.0	738.5	*	1	1500	91	4173.	131.2	743.8	*	1	2310	140	8.	.3	738.5
1	0700	43	0.	.0	738.5	*	1	1510	92	3872.	120.6	743.6	*	1	2320	141	7.	.3	738.5
1	0710	44	0.	.0	738.5	*	1	1520	93	3552.	109.4	743.3	*	1	2330	142	6.	.3	738.5
1	0720	45	0.	.0	738.5	*	1	1530	94	3226.	98.0	743.0	*	1	2340	143	5.	.2	738.5
1	0730	46	0.	.0	738.5	*	1	1540	95	2933.	86.5	742.8	*	1	2350	144	5.	.2	738.5
1	0740	47	0.	.0	738.5	*	1	1550	96	2642.	74.8	742.5	*	2	0000	145	4.	.2	738.5
1	0750	48	0.	.0	738.5	*	1	1600	97	2353.	63.2	742.2	*						
1	0800	49	0.	.0	738.5	*	1	1610	98	2040.	52.2	741.9	*						
						*							*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4555.	14.50	(CFS)	2259.	582.	582.	582.
		(INCHES)	1.626	1.676	1.676	1.676
		(AC-FT)	1120.	1155.	1155.	1155.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
148.	14.50	66.	17.	17.	17.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
744.14	14.50	741.91	739.42	739.42	739.42

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT SPWY5
TRANSPOSITION AREA 30.0 SQ MI

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	*	1		0810	50	0.	.0	738.5	*	1		1620	99	1562.	40.2	741.3
1		0010	2	0.	.0	738.5	*	1		0820	51	0.	.0	738.5	*	1		1630	100	1279.	33.1	741.0

1	0020	3	0.	.0	738.5	*	1	0830	52	0.	.0	738.5	*	1	1640	101	1079.	26.8	740.7
1	0030	4	0.	.0	738.5	*	1	0840	53	0.	.0	738.5	*	1	1650	102	896.	21.0	740.5
1	0040	5	0.	.0	738.5	*	1	0850	54	0.	.0	738.5	*	1	1700	103	742.	16.1	740.2
1	0050	6	0.	.0	738.5	*	1	0900	55	0.	.0	738.5	*	1	1710	104	619.	12.2	740.1
1	0100	7	0.	.0	738.5	*	1	0910	56	0.	.0	738.5	*	1	1720	105	462.	9.5	739.7
1	0110	8	0.	.0	738.5	*	1	0920	57	0.	.0	738.5	*	1	1730	106	349.	8.1	739.5
1	0120	9	0.	.0	738.5	*	1	0930	58	0.	.0	738.5	*	1	1740	107	287.	7.3	739.4
1	0130	10	0.	.0	738.5	*	1	0940	59	0.	.0	738.5	*	1	1750	108	244.	6.7	739.3
1	0140	11	0.	.0	738.5	*	1	0950	60	0.	.0	738.5	*	1	1800	109	212.	6.3	739.2
1	0150	12	0.	.0	738.5	*	1	1000	61	0.	.0	738.5	*	1	1810	110	189.	6.0	739.2
1	0200	13	0.	.0	738.5	*	1	1010	62	0.	.0	738.5	*	1	1820	111	170.	5.8	739.1
1	0210	14	0.	.0	738.5	*	1	1020	63	0.	.0	738.5	*	1	1830	112	154.	5.6	739.1
1	0220	15	0.	.0	738.5	*	1	1030	64	0.	.0	738.5	*	1	1840	113	139.	5.4	739.1
1	0230	16	0.	.0	738.5	*	1	1040	65	0.	.0	738.5	*	1	1850	114	125.	5.2	739.0
1	0240	17	0.	.0	738.5	*	1	1050	66	0.	.0	738.5	*	1	1900	115	112.	5.0	739.0
1	0250	18	0.	.0	738.5	*	1	1100	67	0.	.0	738.5	*	1	1910	116	106.	4.8	739.0
1	0300	19	0.	.0	738.5	*	1	1110	68	0.	.0	738.5	*	1	1920	117	101.	4.6	739.0
1	0310	20	0.	.0	738.5	*	1	1120	69	0.	.0	738.5	*	1	1930	118	94.	4.3	738.9
1	0320	21	0.	.0	738.5	*	1	1130	70	0.	.0	738.5	*	1	1940	119	87.	4.0	738.9
1	0330	22	0.	.0	738.5	*	1	1140	71	22.	1.0	738.6	*	1	1950	120	80.	3.6	738.9
1	0340	23	0.	.0	738.5	*	1	1150	72	162.	5.7	739.1	*	1	2000	121	73.	3.3	738.8
1	0350	24	0.	.0	738.5	*	1	1200	73	692.	14.5	740.2	*	1	2010	122	66.	3.0	738.8
1	0400	25	0.	.0	738.5	*	1	1210	74	1030.	25.2	740.6	*	1	2020	123	60.	2.7	738.8
1	0410	26	0.	.0	738.5	*	1	1220	75	1283.	33.2	741.0	*	1	2030	124	54.	2.4	738.7
1	0420	27	0.	.0	738.5	*	1	1230	76	1345.	34.7	741.1	*	1	2040	125	48.	2.2	738.7
1	0430	28	0.	.0	738.5	*	1	1240	77	1256.	32.4	741.0	*	1	2050	126	43.	1.9	738.7
1	0440	29	0.	.0	738.5	*	1	1250	78	1254.	32.3	741.0	*	1	2100	127	38.	1.7	738.7
1	0450	30	0.	.0	738.5	*	1	1300	79	1466.	37.8	741.2	*	1	2110	128	34.	1.5	738.7
1	0500	31	0.	.0	738.5	*	1	1310	80	1839.	47.2	741.6	*	1	2120	129	30.	1.4	738.6
1	0510	32	0.	.0	738.5	*	1	1320	81	2237.	58.5	742.1	*	1	2130	130	27.	1.2	738.6
1	0520	33	0.	.0	738.5	*	1	1330	82	2571.	71.9	742.4	*	1	2140	131	24.	1.1	738.6
1	0530	34	0.	.0	738.5	*	1	1340	83	2963.	87.7	742.8	*	1	2150	132	21.	.9	738.6
1	0540	35	0.	.0	738.5	*	1	1350	84	3404.	104.3	743.2	*	1	2200	133	18.	.8	738.6
1	0550	36	0.	.0	738.5	*	1	1400	85	3830.	119.2	743.5	*	1	2210	134	16.	.7	738.6
1	0600	37	0.	.0	738.5	*	1	1410	86	4159.	130.7	743.8	*	1	2220	135	14.	.6	738.6
1	0610	38	0.	.0	738.5	*	1	1420	87	4364.	137.9	744.0	*	1	2230	136	13.	.6	738.6
1	0620	39	0.	.0	738.5	*	1	1430	88	4411.	140.3	744.0	*	1	2240	137	11.	.5	738.6
1	0630	40	0.	.0	738.5	*	1	1440	89	4371.	138.1	744.0	*	1	2250	138	10.	.4	738.5
1	0640	41	0.	.0	738.5	*	1	1450	90	4205.	132.3	743.9	*	1	2300	139	8.	.4	738.5
1	0650	42	0.	.0	738.5	*	1	1500	91	3971.	124.1	743.7	*	1	2310	140	7.	.3	738.5
1	0700	43	0.	.0	738.5	*	1	1510	92	3694.	114.4	743.4	*	1	2320	141	7.	.3	738.5
1	0710	44	0.	.0	738.5	*	1	1520	93	3395.	103.9	743.2	*	1	2330	142	6.	.3	738.5
1	0720	45	0.	.0	738.5	*	1	1530	94	3097.	93.1	742.9	*	1	2340	143	5.	.2	738.5
1	0730	46	0.	.0	738.5	*	1	1540	95	2819.	81.9	742.6	*	1	2350	144	4.	.2	738.5
1	0740	47	0.	.0	738.5	*	1	1550	96	2536.	70.5	742.4	*	2	0000	145	4.	.2	738.5
1	0750	48	0.	.0	738.5	*	1	1600	97	2256.	59.3	742.1	*						
1	0800	49	0.	.0	738.5	*	1	1610	98	1909.	48.9	741.7	*						
						*							*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4411.	14.50	(CFS)	2162.	557.	557.	557.
		(INCHES)	1.556	1.604	1.604	1.604
		(AC-FT)	1072.	1106.	1106.	1106.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
140.	14.50	63.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
744.03	14.50	741.81	739.40	739.40	739.40

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT SPWY5
TRANSPOSITION AREA 50.0 SQ MI

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	*	1		0810	50	0.	.0	738.5	*	1		1620	99	1461.	37.7	741.2
1		0010	2	0.	.0	738.5	*	1		0820	51	0.	.0	738.5	*	1		1630	100	1210.	30.9	740.9
1		0020	3	0.	.0	738.5	*	1		0830	52	0.	.0	738.5	*	1		1640	101	1017.	24.8	740.6
1		0030	4	0.	.0	738.5	*	1		0840	53	0.	.0	738.5	*	1		1650	102	843.	19.3	740.4
1		0040	5	0.	.0	738.5	*	1		0850	54	0.	.0	738.5	*	1		1700	103	699.	14.8	740.2
1		0050	6	0.	.0	738.5	*	1		0900	55	0.	.0	738.5	*	1		1710	104	584.	11.1	740.0
1		0100	7	0.	.0	738.5	*	1		0910	56	0.	.0	738.5	*	1		1720	105	407.	8.8	739.6
1		0110	8	0.	.0	738.5	*	1		0920	57	0.	.0	738.5	*	1		1730	106	322.	7.7	739.4
1		0120	9	0.	.0	738.5	*	1		0930	58	0.	.0	738.5	*	1		1740	107	271.	7.1	739.3
1		0130	10	0.	.0	738.5	*	1		0940	59	0.	.0	738.5	*	1		1750	108	232.	6.6	739.3
1		0140	11	0.	.0	738.5	*	1		0950	60	0.	.0	738.5	*	1		1800	109	203.	6.2	739.2
1		0150	12	0.	.0	738.5	*	1		1000	61	0.	.0	738.5	*	1		1810	110	183.	5.9	739.2
1		0200	13	0.	.0	738.5	*	1		1010	62	0.	.0	738.5	*	1		1820	111	165.	5.7	739.1
1		0210	14	0.	.0	738.5	*	1		1020	63	0.	.0	738.5	*	1		1830	112	149.	5.5	739.1
1		0220	15	0.	.0	738.5	*	1		1030	64	0.	.0	738.5	*	1		1840	113	134.	5.3	739.1
1		0230	16	0.	.0	738.5	*	1		1040	65	0.	.0	738.5	*	1		1850	114	121.	5.1	739.0
1		0240	17	0.	.0	738.5	*	1		1050	66	0.	.0	738.5	*	1		1900	115	109.	5.0	739.0
1		0250	18	0.	.0	738.5	*	1		1100	67	0.	.0	738.5	*	1		1910	116	105.	4.8	739.0
1		0300	19	0.	.0	738.5	*	1		1110	68	0.	.0	738.5	*	1		1920	117	99.	4.5	738.9
1		0310	20	0.	.0	738.5	*	1		1120	69	0.	.0	738.5	*	1		1930	118	92.	4.2	738.9
1		0320	21	0.	.0	738.5	*	1		1130	70	0.	.0	738.5	*	1		1940	119	85.	3.9	738.9
1		0330	22	0.	.0	738.5	*	1		1140	71	21.	1.0	738.6	*	1		1950	120	78.	3.5	738.9
1		0340	23	0.	.0	738.5	*	1		1150	72	150.	5.5	739.1	*	1		2000	121	71.	3.2	738.8
1		0350	24	0.	.0	738.5	*	1		1200	73	677.	14.1	740.1	*	1		2010	122	64.	2.9	738.8
1		0400	25	0.	.0	738.5	*	1		1210	74	1002.	24.3	740.6	*	1		2020	123	58.	2.6	738.8
1		0410	26	0.	.0	738.5	*	1		1220	75	1242.	32.0	741.0	*	1		2030	124	52.	2.4	738.7
1		0420	27	0.	.0	738.5	*	1		1230	76	1292.	33.4	741.0	*	1		2040	125	46.	2.1	738.7
1		0430	28	0.	.0	738.5	*	1		1240	77	1212.	31.0	740.9	*	1		2050	126	41.	1.9	738.7
1		0440	29	0.	.0	738.5	*	1		1250	78	1199.	30.6	740.9	*	1		2100	127	37.	1.7	738.7
1		0450	30	0.	.0	738.5	*	1		1300	79	1377.	35.6	741.1	*	1		2110	128	33.	1.5	738.6
1		0500	31	0.	.0	738.5	*	1		1310	80	1733.	44.5	741.5	*	1		2120	129	29.	1.3	738.6
1		0510	32	0.	.0	738.5	*	1		1320	81	2154.	55.2	742.0	*	1		2130	130	26.	1.2	738.6
1		0520	33	0.	.0	738.5	*	1		1330	82	2466.	67.7	742.3	*	1		2140	131	23.	1.0	738.6
1		0530	34	0.	.0	738.5	*	1		1340	83	2840.	82.7	742.7	*	1		2150	132	20.	.9	738.6
1		0540	35	0.	.0	738.5	*	1		1350	84	3248.	98.8	743.1	*	1		2200	133	18.	.8	738.6
1		0550	36	0.	.0	738.5	*	1		1400	85	3666.	113.4	743.4	*	1		2210	134	16.	.7	738.6
1		0600	37	0.	.0	738.5	*	1		1410	86	3988.	124.7	743.7	*	1		2220	135	14.	.6	738.6
1		0610	38	0.	.0	738.5	*	1		1420	87	4184.	131.6	743.8	*	1		2230	136	12.	.5	738.6
1		0620	39	0.	.0	738.5	*	1		1430	88	4242.	133.6	743.9	*	1		2240	137	11.	.5	738.5
1		0630	40	0.	.0	738.5	*	1		1440	89	4178.	131.3	743.8	*	1		2250	138	9.	.4	738.5
1		0640	41	0.	.0	738.5	*	1		1450	90	4020.	125.8	743.7	*	1		2300	139	8.	.4	738.5
1		0650	42	0.	.0	738.5	*	1		1500	91	3800.	118.1	743.5	*	1		2310	140	7.	.3	738.5
1		0700	43	0.	.0	738.5	*	1		1510	92	3539.	109.0	743.3	*	1		2320	141	6.	.3	738.5
1		0710	44	0.	.0	738.5	*	1		1520	93	3253.	99.0	743.1	*	1		2330	142	5.	.2	738.5

1	0720	45	0.	.0	738.5 *	1	1530	94	2982.	88.5	742.8 *	1	2340	143	5.	.2	738.5
1	0730	46	0.	.0	738.5 *	1	1540	95	2710.	77.5	742.5 *	1	2350	144	4.	.2	738.5
1	0740	47	0.	.0	738.5 *	1	1550	96	2434.	66.4	742.3 *	2	0000	145	4.	.2	738.5
1	0750	48	0.	.0	738.5 *	1	1600	97	2162.	55.5	742.0 *						
1	0800	49	0.	.0	738.5 *	1	1610	98	1780.	45.7	741.6 *						
					*						*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4242.	14.50	(CFS)	2066.	533.	533.	533.
		(INCHES)	1.487	1.534	1.534	1.534
		(AC-FT)	1025.	1057.	1057.	1057.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
134.	14.50	59.	16.	16.	16.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
743.89	14.50	741.71	739.37	739.37	739.37

CUMULATIVE AREA = 12.92 SQ MI

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HYDROGRAPH AT SPWY5
TRANSPOSITION AREA 100.0 SQ MI

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	738.5	*	1		0810	50	0.	.0	738.5	*	1		1620	99	1310.	33.9	741.0
1		0010	2	0.	.0	738.5	*	1		0820	51	0.	.0	738.5	*	1		1630	100	1105.	27.6	740.8
1		0020	3	0.	.0	738.5	*	1		0830	52	0.	.0	738.5	*	1		1640	101	921.	21.8	740.5
1		0030	4	0.	.0	738.5	*	1		0840	53	0.	.0	738.5	*	1		1650	102	760.	16.7	740.3
1		0040	5	0.	.0	738.5	*	1		0850	54	0.	.0	738.5	*	1		1700	103	631.	12.6	740.1
1		0050	6	0.	.0	738.5	*	1		0900	55	0.	.0	738.5	*	1		1710	104	478.	9.7	739.8
1		0100	7	0.	.0	738.5	*	1		0910	56	0.	.0	738.5	*	1		1720	105	356.	8.2	739.5
1		0110	8	0.	.0	738.5	*	1		0920	57	0.	.0	738.5	*	1		1730	106	291.	7.3	739.4
1		0120	9	0.	.0	738.5	*	1		0930	58	0.	.0	738.5	*	1		1740	107	248.	6.8	739.3
1		0130	10	0.	.0	738.5	*	1		0940	59	0.	.0	738.5	*	1		1750	108	215.	6.4	739.2
1		0140	11	0.	.0	738.5	*	1		0950	60	0.	.0	738.5	*	1		1800	109	192.	6.1	739.2
1		0150	12	0.	.0	738.5	*	1		1000	61	0.	.0	738.5	*	1		1810	110	173.	5.8	739.1
1		0200	13	0.	.0	738.5	*	1		1010	62	0.	.0	738.5	*	1		1820	111	156.	5.6	739.1
1		0210	14	0.	.0	738.5	*	1		1020	63	0.	.0	738.5	*	1		1830	112	141.	5.4	739.1
1		0220	15	0.	.0	738.5	*	1		1030	64	0.	.0	738.5	*	1		1840	113	127.	5.2	739.0
1		0230	16	0.	.0	738.5	*	1		1040	65	0.	.0	738.5	*	1		1850	114	114.	5.1	739.0
1		0240	17	0.	.0	738.5	*	1		1050	66	0.	.0	738.5	*	1		1900	115	107.	4.9	739.0
1		0250	18	0.	.0	738.5	*	1		1100	67	0.	.0	738.5	*	1		1910	116	102.	4.6	739.0
1		0300	19	0.	.0	738.5	*	1		1110	68	0.	.0	738.5	*	1		1920	117	95.	4.3	738.9
1		0310	20	0.	.0	738.5	*	1		1120	69	0.	.0	738.5	*	1		1930	118	88.	4.0	738.9
1		0320	21	0.	.0	738.5	*	1		1130	70	0.	.0	738.5	*	1		1940	119	81.	3.7	738.9
1		0330	22	0.	.0	738.5	*	1		1140	71	20.	.9	738.6	*	1		1950	120	74.	3.4	738.8
1		0340	23	0.	.0	738.5	*	1		1150	72	131.	5.3	739.0	*	1		2000	121	67.	3.1	738.8
1		0350	24	0.	.0	738.5	*	1		1200	73	653.	13.3	740.1	*	1		2010	122	61.	2.8	738.8
1		0400	25	0.	.0	738.5	*	1		1210	74	955.	22.9	740.5	*	1		2020	123	55.	2.5	738.7
1		0410	26	0.	.0	738.5	*	1		1220	75	1179.	30.0	740.9	*	1		2030	124	49.	2.2	738.7

1	0420	27	0.	.0	738.5	*	1	1230	76	1217.	31.2	740.9	*	1	2040	125	44.	2.0	738.7
1	0430	28	0.	.0	738.5	*	1	1240	77	1140.	28.7	740.8	*	1	2050	126	39.	1.8	738.7
1	0440	29	0.	.0	738.5	*	1	1250	78	1114.	27.9	740.8	*	1	2100	127	35.	1.6	738.7
1	0450	30	0.	.0	738.5	*	1	1300	79	1246.	32.1	741.0	*	1	2110	128	31.	1.4	738.6
1	0500	31	0.	.0	738.5	*	1	1310	80	1566.	40.3	741.3	*	1	2120	129	27.	1.2	738.6
1	0510	32	0.	.0	738.5	*	1	1320	81	1964.	50.3	741.8	*	1	2130	130	24.	1.1	738.6
1	0520	33	0.	.0	738.5	*	1	1330	82	2317.	61.7	742.2	*	1	2140	131	21.	1.0	738.6
1	0530	34	0.	.0	738.5	*	1	1340	83	2652.	75.2	742.5	*	1	2150	132	19.	.9	738.6
1	0540	35	0.	.0	738.5	*	1	1350	84	3022.	90.1	742.8	*	1	2200	133	17.	.8	738.6
1	0550	36	0.	.0	738.5	*	1	1400	85	3399.	104.1	743.2	*	1	2210	134	15.	.7	738.6
1	0600	37	0.	.0	738.5	*	1	1410	86	3707.	114.9	743.4	*	1	2220	135	13.	.6	738.6
1	0610	38	0.	.0	738.5	*	1	1420	87	3890.	121.3	743.6	*	1	2230	136	11.	.5	738.6
1	0620	39	0.	.0	738.5	*	1	1430	88	3939.	123.0	743.6	*	1	2240	137	10.	.5	738.5
1	0630	40	0.	.0	738.5	*	1	1440	89	3875.	120.7	743.6	*	1	2250	138	9.	.4	738.5
1	0640	41	0.	.0	738.5	*	1	1450	90	3730.	115.7	743.5	*	1	2300	139	8.	.3	738.5
1	0650	42	0.	.0	738.5	*	1	1500	91	3528.	108.6	743.3	*	1	2310	140	7.	.3	738.5
1	0700	43	0.	.0	738.5	*	1	1510	92	3287.	100.2	743.1	*	1	2320	141	6.	.3	738.5
1	0710	44	0.	.0	738.5	*	1	1520	93	3040.	90.8	742.9	*	1	2330	142	5.	.2	738.5
1	0720	45	0.	.0	738.5	*	1	1530	94	2788.	80.7	742.6	*	1	2340	143	5.	.2	738.5
1	0730	46	0.	.0	738.5	*	1	1540	95	2527.	70.2	742.4	*	1	2350	144	4.	.2	738.5
1	0740	47	0.	.0	738.5	*	1	1550	96	2263.	59.6	742.1	*	2	0000	145	3.	.2	738.5
1	0750	48	0.	.0	738.5	*	1	1600	97	1935.	49.6	741.8	*						
1	0800	49	0.	.0	738.5	*	1	1610	98	1593.	41.0	741.4	*						
						*							*						

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
3939.	14.50	(CFS)	1911.	493.	493.	493.
		(INCHES)	1.375	1.420	1.420	1.420
		(AC-FT)	948.	978.	978.	978.

PEAK STORAGE (AC-FT)	TIME (HR)	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	24.00-HR
123.	14.50	54.	14.	14.	14.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.00-HR
743.64	14.50	741.55	739.33	739.33	739.33

CUMULATIVE AREA = 12.92 SQ MI

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INTERPOLATED HYDROGRAPH AT SPWY5

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0610	38	0.	*	1		1220	75	1377.	*	1		1830	112	163.
1		0010	2	0.	*	1		0620	39	0.	*	1		1230	76	1447.	*	1		1840	113	147.
1		0020	3	0.	*	1		0630	40	0.	*	1		1240	77	1366.	*	1		1850	114	133.
1		0030	4	0.	*	1		0640	41	0.	*	1		1250	78	1394.	*	1		1900	115	119.
1		0040	5	0.	*	1		0650	42	0.	*	1		1300	79	1649.	*	1		1910	116	109.
1		0050	6	0.	*	1		0700	43	0.	*	1		1310	80	2057.	*	1		1920	117	104.
1		0100	7	0.	*	1		0710	44	0.	*	1		1320	81	2409.	*	1		1930	118	98.
1		0110	8	0.	*	1		0720	45	0.	*	1		1330	82	2788.	*	1		1940	119	91.
1		0120	9	0.	*	1		0730	46	0.	*	1		1340	83	3226.	*	1		1950	120	84.

1	0130	10	0.	*	1	0740	47	0.	*	1	1350	84	3718.	*	1	2000	121	77.
1	0140	11	0.	*	1	0750	48	0.	*	1	1400	85	4159.	*	1	2010	122	70.
1	0150	12	0.	*	1	0800	49	0.	*	1	1410	86	4461.	*	1	2020	123	63.
1	0200	13	0.	*	1	0810	50	0.	*	1	1420	87	4633.	*	1	2030	124	57.
1	0210	14	0.	*	1	0820	51	0.	*	1	1430	88	4711.	*	1	2040	125	51.
1	0220	15	0.	*	1	0830	52	0.	*	1	1440	89	4691.	*	1	2050	126	46.
1	0230	16	0.	*	1	0840	53	0.	*	1	1450	90	4578.	*	1	2100	127	41.
1	0240	17	0.	*	1	0850	54	0.	*	1	1500	91	4373.	*	1	2110	128	36.
1	0250	18	0.	*	1	0900	55	0.	*	1	1510	92	4081.	*	1	2120	129	32.
1	0300	19	0.	*	1	0910	56	0.	*	1	1520	93	3732.	*	1	2130	130	29.
1	0310	20	0.	*	1	0920	57	0.	*	1	1530	94	3383.	*	1	2140	131	25.
1	0320	21	0.	*	1	0930	58	0.	*	1	1540	95	3055.	*	1	2150	132	22.
1	0330	22	0.	*	1	0940	59	0.	*	1	1550	96	2755.	*	1	2200	133	20.
1	0340	23	0.	*	1	0950	60	0.	*	1	1600	97	2457.	*	1	2210	134	17.
1	0350	24	0.	*	1	1000	61	0.	*	1	1610	98	2156.	*	1	2220	135	15.
1	0400	25	0.	*	1	1010	62	0.	*	1	1620	99	1783.	*	1	2230	136	13.
1	0410	26	0.	*	1	1020	63	0.	*	1	1630	100	1455.	*	1	2240	137	12.
1	0420	27	0.	*	1	1030	64	0.	*	1	1640	101	1200.	*	1	2250	138	10.
1	0430	28	0.	*	1	1040	65	0.	*	1	1650	102	1004.	*	1	2300	139	9.
1	0440	29	0.	*	1	1050	66	0.	*	1	1700	103	834.	*	1	2310	140	8.
1	0450	30	0.	*	1	1100	67	0.	*	1	1710	104	694.	*	1	2320	141	7.
1	0500	31	0.	*	1	1110	68	0.	*	1	1720	105	570.	*	1	2330	142	6.
1	0510	32	0.	*	1	1120	69	0.	*	1	1730	106	412.	*	1	2340	143	5.
1	0520	33	0.	*	1	1130	70	0.	*	1	1740	107	323.	*	1	2350	144	5.
1	0530	34	0.	*	1	1140	71	24.	*	1	1750	108	270.	*	2	0000	145	4.
1	0540	35	0.	*	1	1150	72	185.	*	1	1800	109	231.	*				
1	0550	36	0.	*	1	1200	73	721.	*	1	1810	110	202.	*				
1	0600	37	0.	*	1	1210	74	1086.	*	1	1820	111	181.	*				
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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.00-HR
4711.	14.50	(CFS)	2360.	608.	608.	608.
		(INCHES)	1.698	1.750	1.750	1.750
		(AC-FT)	1170.	1206.	1206.	1206.

CUMULATIVE AREA = 12.92 SQ MI

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	701	4331.	12.83	937.	248.	248.	6.40		
ROUTED TO	7R1	3802.	13.17	906.	229.	229.	6.40		
HYDROGRAPH AT	702	3689.	12.50	647.	174.	174.	4.32		
2 COMBINED AT	7C1	5948.	12.67	1531.	397.	397.	10.72		
ROUTED TO	7R2	5074.	13.17	1493.	378.	378.	10.72		
HYDROGRAPH AT	703	1713.	13.00	432.	116.	116.	2.73		
2 COMBINED AT	CD1	6562.	13.17	1881.	483.	483.	13.45		
DIVERSION TO	DIV1	1320.	13.17	361.	90.	90.	13.45		
HYDROGRAPH AT	D1	5242.	13.17	1520.	393.	393.	13.45		
ROUTED TO	7R3	4761.	13.50	1482.	375.	375.	13.45		
HYDROGRAPH AT	704	3037.	12.50	510.	140.	140.	3.25		
2 COMBINED AT	7C2	4935.	13.50	1934.	502.	502.	16.70		
ROUTED TO	7R4	4193.	14.33	1605.	403.	403.	16.70		
HYDROGRAPH AT	705	2241.	12.83	482.	123.	123.	3.71		
2 COMBINED AT	CD5	4260.	14.33	1998.	511.	511.	20.41		
DIVERSION TO	DIV5	1159.	14.33	543.	139.	139.	20.41		
HYDROGRAPH AT	D5	3101.	14.33	1455.	372.	372.	20.41		
HYDROGRAPH AT	RD5	1159.	14.33	543.	139.	139.	20.41		
ROUTED TO	7R6	1079.	14.67	503.	129.	129.	20.41		
HYDROGRAPH AT	707	602.	12.33	71.	18.	18.	.64		
2 COMBINED AT	7C5	1199.	14.67	618.	161.	161.	.64		
HYDROGRAPH AT	801	2902.	13.50	989.	268.	268.	3.38		
ROUTED TO	8R1	2585.	13.67	825.	206.	206.	3.38		
HYDROGRAPH AT	802	2176.	12.67	416.	110.	110.	1.38		
2 COMBINED AT	8C1	3057.	12.67	1230.	314.	314.	4.76		
ROUTED TO	8R2	2742.	12.83	1117.	279.	279.	4.76		

HYDROGRAPH AT	803	2453.	13.50	798.	210.	210.	3.05
HYDROGRAPH AT	RD1	1320.	13.17	361.	90.	90.	13.45
ROUTED TO	8R3	494.	13.67	72.	18.	18.	13.45
3 COMBINED AT	8C2	5522.	13.50	1978.	505.	505.	7.81
ROUTED TO	8R4	4173.	13.83	1303.	326.	326.	7.81
HYDROGRAPH AT	804	4556.	13.33	1413.	382.	382.	5.64
2 COMBINED AT	8C3	7741.	13.50	2630.	685.	685.	13.45
ROUTED TO	8R5	7250.	13.67	2415.	604.	604.	13.45
HYDROGRAPH AT	805	2084.	12.83	493.	134.	134.	1.62
2 COMBINED AT	8C4	7998.	13.50	2858.	725.	725.	15.07
ROUTED TO	8R6	6355.	14.17	2185.	546.	546.	15.07
HYDROGRAPH AT	806	421.	13.00	101.	25.	25.	.47
2 COMBINED AT	CD2	6434.	14.00	2272.	568.	568.	15.54
DIVERSION TO	DIV2	304.	14.00	35.	9.	9.	15.54
HYDROGRAPH AT	D2	6130.	14.00	2238.	560.	560.	15.54
ROUTED TO	8R7	5188.	14.50	1787.	447.	447.	15.54
HYDROGRAPH AT	807	2117.	13.33	628.	164.	164.	2.54
2 COMBINED AT	8C5	5994.	14.17	2350.	594.	594.	18.08
ROUTED TO	8R8	5417.	14.50	2053.	513.	513.	18.08
HYDROGRAPH AT	808	506.	12.33	67.	17.	17.	.31
2 COMBINED AT	8C6	5417.	14.50	2114.	529.	529.	18.39
DIVERSION TO	D8STH	1290.	14.50	488.	122.	122.	18.39
HYDROGRAPH AT	D8NRTH	4119.	14.50	1623.	406.	406.	18.39
DIVERSION TO	PSPILL	2088.	14.50	858.	214.	214.	18.39
HYDROGRAPH AT	D8NRTH	2031.	14.50	765.	191.	191.	18.39
2 COMBINED AT	7CMB8	3088.	14.50	1322.	337.	337.	19.03
ROUTED TO	BERMOT	3073.	14.67	1270.	329.	329.	19.03
HYDROGRAPH AT	FLW8S	1290.	14.50	488.	122.	122.	18.39
ROUTED TO	CHAN9	1005.	15.50	468.	122.	122.	18.39
HYDROGRAPH AT	901	1699.	12.67	311.	78.	78.	2.25

HYDROGRAPH AT	RD2	304.	14.00	35.	9.	9.	15.54
ROUTED TO	9R1	0.	.17	0.	0.	0.	15.54
2 COMBINED AT	9C1	1699.	12.67	313.	79.	79.	2.25
ROUTED TO	9R2	1158.	13.00	202.	51.	51.	2.25
HYDROGRAPH AT	902	1407.	12.17	168.	42.	42.	1.26
2 COMBINED AT	9C2	1459.	12.33	367.	92.	92.	3.51
HYDROGRAPH AT	1001	3563.	13.83	1304.	341.	341.	4.63
HYDROGRAPH AT	1002	3636.	13.50	1120.	287.	287.	4.49
2 COMBINED AT	10C1	6699.	13.67	2404.	623.	623.	9.12
ROUTED TO	10R1	4885.	14.17	1555.	389.	389.	9.12
HYDROGRAPH AT	1003	629.	12.17	61.	15.	15.	.29
2 COMBINED AT	10C2	4885.	14.17	1614.	403.	403.	9.41
3 COMBINED AT	CMB10	5252.	14.17	2368.	608.	608.	12.92
ROUTED TO	SPWY5	4711.	14.50	2360.	608.	608.	12.92

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:36.08 (36.08 Seconds)
NORMAL END OF HEC-1

HEC1 S/N: HMVersion: 6.00 Data File: bfd2.hc1

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  11/23/1991  TIME  15:45:05 *
*                                      *
****************************************
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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
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::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
:::                                  :::
:::  Full Microcomputer Implementation :::
:::                by                :::
:::       Haestad Methods, Inc.      :::
:::                                  :::
::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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            GILA BEND CANAL FLOODPLAIN STUDY
  2           ID            FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  3           ID            DONOHUE AND ASSOCIATES  PROJECT NO. 18099
  4           ID            DATE: 11-17-91
  5           ID            FILENAME: BFD.HC1
  6           ID            HYDRAULIC ANALYSIS FOR  BASINS 11 - 15
  7           ID                     24-HOUR STORM
  8           IT      10                   145
  9           IN      30
 10           IO       5
              *DIAGRAM
 11           JD    4.20     .01
 12           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 13           PC    .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
 14           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 15           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 16           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 17           JD    3.99    10.0
 18           JD    3.86    20.0
 19           JD    3.78    30.0
 20           JD    3.70    50.0
 21           JD    3.57   100.0
              *  BASIN NO. 11

 22           KK    1101
 23           KM            SUB-BASIN 1101
 24           BA    5.20
 25           LG     .27     .24    8.20     .10   12.00
 26           UI    254.    493.   1076.   1395.   1730.   2256.   3155.   2503.   2005.   1586.
 27           UI   1251.    830.    445.    391.    254.    153.     78.     78.     78.     78.
 28           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 29           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 30           KK    11R1
 31           RS       8   FLOW      -1
 32           RL                      5     100
 33           RC     .05     .05     .05   23885   .0155     105
 34           RX       0     100    2961    3501    4041    4581    7442    7542
 35           RY     106     104     102   100.1     100     102     104     106

 36           KK    1102
 37           KM            SUB-BASIN 1102
 38           BA    5.64
 39           LG     .34     .28    5.00     .22    2.00
 40           UI    214.    214.    734.    983.   1192.   1391.   1671.   2234.   2698.   2135.
 41           UI   1784.   1501.   1248.   1037.    741.    445.    363.    304.    214.    166.
 42           UI     66.     66.     66.     66.     66.     66.      0.      0.      0.      0.
 43           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 44           KK    11C1
 45           HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 46           KK    11R2
 47           RS       1    FLOW      -1
 48           RL                       5     100
 49           RC     .05     .05     .05    2300   .0130     105
 50           RX       0     100    2500    3000    3500    4000    6400    6500
 51           RY     106     104     102   100.1     100     102     104     106

 52           KK    1103
 53           KM           SUB-BASIN 1103
 54           BA     .59
 55           LG     .35     .30    3.70     .30     .00
 56           UI     64.    229.    348.    579.    462.    308.    168.     81.     42.     16.
 57           UI     16.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 58           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 59           KK    11C2
 60           KM            TOTAL FLOW FOR BASIN 11
 61           HC       2

 62           KK  SPLWY6
              * KO     2
 63           KM           SPILLWAY AT SIPHON 6 - STIEL #2
              *          ROUTE FLOW THRU RES. 8 AND SPILLWAY OVER SIPHON 6
 64           RS       1    ELEV   734.6
 65           SV       0    0.05    0.32    2.44    9.76   32.50   80.97  167.49  300.84  495.50
 66           SE   734.6     735     736     738     740     742     744     746     748     750
 67           SQ       0      32     230     538     940    1430    2005    2664    3407    5149
 68           SQ    7237    9680   12488   15673
 69           SE   734.6     735     736     737     738     739     740     741     742     744
 70           SE     746     748     750     752
              *  OUTFLOW FROM SIPHON 6 GOES OUT OF WATERSHED
              *  BASIN NO. 12

 71           KK    1201
 72           KM           SUB-BASIN 1201
 73           BA    4.06
 74           LG     .27     .23    8.40     .09   14.00
 75           UI    291.   1071.   1659.   2339.   3455.   2520.   1802.   1193.    557.    371.
 76           UI    192.     89.     89.     89.      0.      0.      0.      0.      0.      0.
 77           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 78           KK    12R1
 79           RS       5    FLOW      -1
 80           RL                       5     100
 81           RC     .05     .05     .05   13577   .0198     105
 82           RX       0     100    4800    5200    5600    6000   10700   10800
 83           RY     106     104     102   100.1     100     102     104     106

 84           KK    1202
 85           KM           SUB-BASIN 1202
 86           BA    4.66
 87           LG     .33     .28    6.60     .19    4.00
 88           UI    296.    912.   1550.   2042.   3084.   3261.   2353.   1738.   1192.    585.
 89           UI    416.    265.     91.     91.     91.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  90          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  91          KK    12C1
  92          HC       2

  93          KK    12R2A
  94          RS       3    FLOW      -1
  95          RL                      5     100
  96          RC     .05     .05     .05    8548   .0294     105
  97          RX       0     100    5358    5725    6092    6460   11717   11817
  98          RY     106     104     102   100.1     100     102     104     106

  99          KK    12R2B
 100          RS       7    FLOW      -1
 101          RL                      5     100
 102          RC     .05     .05     .05   20366   .0133     105
 103          RX       0     100    3447    3830    4213    4596    7945    8045
 104          RY     106     104     102   100.1     100     102     104     106

 105          KK    1203
 106          KM           SUB-BASIN 1203
 107          BA    8.89
 108          LG     .35     .32    4.50     .31     .00
 109          UI    277.    277.    604.   1050.   1330.   1538.   1733.   2020.   2376.   3135.
 110          UI   3509.   2835.   2421.   2137.   1823.   1576.   1349.   1082.    720.    490.
 111          UI    461.    396.    277.    277.    114.     85.     85.     85.     85.     85.
 112          UI     85.     85.      0.      0.      0.      0.      0.      0.      0.      0.
 113          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 114          KK    12C2
 115          HC       2

 116          KK    12R3
 117          RS       1    FLOW      -1
 118          RL                      5     100
 119          RC     .05     .05     .05    2600   .0100     105
 120          RX       0      50      95    1048    2001    2954    2999    3050
 121          RY     106     104     102   100.1     100     102     104     106

 122          KK    1204
 123          KM           SUB-BASIN 1204
 124          BA     .61
 125          LG     .35     .33    4.00     .35     .00
 126          UI    112.    351.    636.    624.    369.    152.     72.     20.     20.      0.
 127          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 128          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 129          KK    12C3
 130          KM         TOTAL FLOW FOR BASIN 12
 131          HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 132          KK  SPLWY7
              * KO     2
 133          KM          SPILLWAY AT SIPHON 7 - TILLEY #1
              *         ROUTE FLOW THROUGH RESERVOIR 7 AND SPILLWAY OVER SIPHON 7
 134          RS       1    ELEV   735.6
 135          SV       0    4.92   21.11   77.39   199.2     390
 136          SE   735.6     742     744     746     748     750
 137          SQ       0      42     212     467     799    1204    1682    2233    2858    3557
 138          SQ    4333    5186    6119    7131
 139          SE   735.6     737     738     739     740     741     742     743     744     745
 140          SE     746     747     748     749
              * OUTFLOW FROM SPILLWAY 7 GOES OUT OF WATERSHED
              *  BASIN NO. 13

 141          KK    1301
 142          KM            SUB-BASIN 1301
 143          BA    5.13
 144          LG     .31     .31    5.70     .32   17.00
 145          UI    235.    408.    945.   1247.   1509.   1895.   2750.   2628.   2042.   1667.
 146          UI   1329.   1039.    611.    405.    333.    235.    125.     72.     72.     72.
 147          UI     72.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 148          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 149          KK    13R1
 150          RS       7    FLOW      -1
 151          RL                      1     100
 152          RC     .05     .05     .05   19108    .011     105
 153          RX       0     100    1400    1640    1880    2120    3420    3520
 154          RY     106     104     102   100.1     100     102     104     106

 155          KK    1302
 156          KM            SUB-BASIN 1302
 157          BA    5.98
 158          LG     .32     .31    5.50     .29    8.00
 159          UI    215.    215.    648.    935.   1137.   1315.   1555.   1901.   2614.   2492.
 160          UI   2000.   1723.   1444.   1219.   1029.    735.    456.    368.    333.    215.
 161          UI    215.     69.     66.     66.     66.     66.     66.     66.      0.      0.
 162          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 163          KK    13C1
 164          HC       2

 165          KK    13R2
 166          RS       4    FLOW      -1
 167          RL                      1     100
 168          RC     .05     .05     .05   11314   .0106     105
 169          RX       0     100    1535    1685    1835    1985    3420    3520
 170          RY     106     104     102   100.1     100     102     104     106
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 171          KK    1303
 172          KM          SUB-BASIN 1303
 173          BA    4.43
 174          LG     .29     .25    7.40     .14    9.00
 175          UI     136.    136.    289.    509.    648.    751.    844.    981.   1141.   1503.
 176          UI    1738.   1418.   1208.   1066.    914.    789.    675.    562.    386.    240.
 177          UI     229.    212.    136.    136.     77.     42.     42.     42.     42.     42.
 178          UI      42.     42.      0.      0.      0.      0.      0.      0.      0.      0.
 179          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 180          KK    13R3
 181          RS       6    FLOW      -1
 182          RL                      1     100
 183          RC     .05     .05     .05   15085   .0113     105
 184          RX       0     100    1535    1685    1835    1985    3420    3520
 185          RY     106     104     102   100.1     100     102     104     106

 186          KK    1304
 187          KM          SUB-BASIN 1304
 188          BA    1.89
 189          LG     .26     .23    8.40     .09   13.00
 190          UI     302.    979.   1649.   2053.   1248.    631.    275.    110.     59.      0.
 191          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 192          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 193          KK    13R4
 194          RS       9    FLOW      -1
 195          RL                      1     100
 196          RC     .05     .05     .05   24640   .0187     105
 197          RX       0     100    2164    2397    2630    2863    4927    5028
 198          RY     106     104     102   100.1     100     102     104     106

 199          KK    1305
 200          KM          SUB-BASIN 1305
 201          BA    6.26
 202          LG     .32     .31    5.50     .28    5.00
 203          UI     291.    504.   1167.   1541.   1864.   2341.   3397.   3246.   2522.   2059.
 204          UI    1642.   1283.    755.    500.    411.    291.    154.     89.     89.     89.
 205          UI     89.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 206          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 207          KK     CD3          COMBINE PRIOR TO DIVERSION
 208          HC       4

 209          KK      D3
 210          KM          DIVERT FLOW TO BASIN 14
 211          DT    DIV3
 212          DI       0     340    2080    3700   10420   20400
 213          DQ       0     110     670    1170    5650   10770
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 214          KK   13R5A
 215          RS      7    FLOW      -1
 216          RL                     1     100
 217          RC    .05     .05     .05   18857   .0117     105
 218          RX      0     100    3749    4099    4449    4799    8448    8548
 219          RY    106     104     102   100.1     100     102     104     106

 220          KK   13R5B
 221          RS      5    FLOW      -1
 222          RL                     1     100
 223          RC    .05     .05     .05   14582   .0110     105
 224          RX      0     100    2976    3171    3366    3561    6437    6537
 225          RY    106     104     102   100.1     100     102     104     106

 226          KK    1306
 227          KM          SUB-BASIN 1306
 228          BA    3.32
 229          LG     .32     .27    7.10     .17    9.00
 230          UI    188.    489.    909.   1170.   1560.   2289.   1813.   1399.   1060.    747.
 231          UI    384.    290.    188.     83.     58.     58.     58.      0.      0.      0.
 232          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 233          KK   13R6A
 234          RS      8    FLOW      -1
 235          RL                     1     100
 236          RC    .05     .05     .05   22628   .0124     105
 237          RX      0     100    3749    4099    4490    4799    8448    8548
 238          RY    106     104     102   100.1     100     102     104     106

 239          KK   13R6B
 240          RS      5    FLOW      -1
 241          RL                     1     100
 242          RC    .05     .05     .05   14080    .011     105
 243          RX      0     100    2976    3171    3366    3561    6437    6537
 244          RY    106     104     102   100.1     100     102     104     106

 245          KK    1307
 246          KM   SUB-BASIN 1307
 247          BA    9.10
 248          LG     .35     .34    4.00     .35     .00
 249          UI    222.    222.    222.    641.    840.   1044.   1162.   1280.   1418.   1609.
 250          UI   1783.   2164.   2732.   2789.   2336.   2043.   1838.   1670.   1464.   1312.
 251          UI   1146.   1043.    824.    628.    393.    386.    365.    319.    222.    222.
 252          UI    200.     68.     68.     68.     68.     68.     68.     68.     68.     68.
 253          UI     68.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 254          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 255          KK    13C2
 256          HC       3
```

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

 257          KK    13R7
 258          RS       1    FLOW      -1
 259          RL                       1     100
 260          RC     .05     .05     .05    2200   .0055     105
 261          RX       0     100     725     842     958    1075    1700    1800
 262          RY     106     104     102   100.1     100     102     104     106

 263          KK    1308
 264          KM   SUB-BASIN 1308
 265          BA     .30
 266          LG     .35     .35    4.10     .40     .00
 267          UI    154.    485.    375.    111.     25.      0.      0.      0.      0.      0.
 268          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 269          KK    13C3
 270          KM       TOTAL FLOW FOR BASIN 13
 271          HC       2
              *  BASIN NO. 14

 272          KK    1401
 273          KM            SUB-BASIN 1401
 274          BA    2.38
 275          LG     .28     .28    6.80     .20   13.00
 276          UI    155.    494.    823.   1093.   1694.   1638.   1193.    873.    575.    274.
 277          UI    198.    115.     48.     48.     48.      0.      0.      0.      0.      0.
 278          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 279          KK   14R1A
 280          RS       3    FLOW      -1
 281          RL                       5     100
 282          RC     .05     .05     .05    9051   .0088     105
 283          RX       0     100    3644    4064    4484    4904    8448    8548
 284          RY     106     104     102   100.1     100     102     104     106

 285          KK   14R1B
 286          RS       6    FLOW      -1
 287          RL                       5     100
 288          RC     .05     .05     .05   16342   .0098     105
 289          RX       0     100    1515    1678    1842    2005    3420    3520
 290          RY     106     104     102   100.1     100     102     104     106

 291          KK    1402
 292          KM            SUB-BASIN 1402
 293          BA    7.54
 294          LG     .35     .32    4.10     .32     .00
 295          UI    145.    145.    145.    145.    476.    539.    638.    708.    788.    839.
 296          UI    912.    997.   1097.   1199.   1420.   1699.   1919.   1691.   1486.   1340.
 297          UI   1231.   1145.   1040.    943.    862.    783.    710.    642.    531.    417.
 298          UI    290.    257.    247.    238.    230.    145.    145.    145.    136.     45.
 299          UI     45.     45.     45.     45.     45.     45.     45.     45.     45.     45.
 300          UI     45.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 301          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 302          KK     RD3
 303          KM            RETRIEVE DIVERTED FLOW FROM BASIN 13
 304          DR    DIV3

 305          KK   14R2A
 306          RS       6    FLOW      -1
 307          RL                      5     100
 308          RC     .05     .05     .05   17850   .0112     105
 309          RX       0     200    3645    4065    4485    4905    8450    8550
 310          RY     106     104     102   100.1     100     102     104     106

 311          KK   14R2B
 312          RS       6    FLOW      -1
 313          RL                      5     100
 314          RC     .05     .05     .05   17600   .0099     105
 315          RX       0     100    1515    1678    1842    2005    3420    3520
 316          RY     106     104     102   100.1     100     102     104     106

 317          KK    14C1
 318          HC       3

 319          KK    14R3
 320          RS       1    FLOW      -1
 321          RL                      5     100
 322          RC     .05     .05     .05    2200     .01     105
 323          RX       0     100    1365    1455    1545    1635    2900    3000
 324          RY     106     104     102   100.1     100     102     104     106

 325          KK    1403
 326          KM            SUB-BASIN 1403
 327          BA     .28
 328          LG     .35     .35    4.10     .36     .00
 329          UI    243.    635.    237.     38.      0.      0.      0.      0.      0.      0.
 330          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 331          KK    14C2
 332          KM            TOTAL FLOW FOR BASIN 14
 333          HC       2
              *  BASIN NO. 15

 334          KK    1501
 335          KM            SUB-BASIN 1501
 336          BA    8.79
 337          LG     .31     .30    5.70     .27    5.00
 338          UI    312.    312.    917.   1342.   1638.   1889.   2231.   2697.   3692.   3709.
 339          UI   2962.   2535.   2149.   1813.   1521.   1153.    721.    540.    512.    323.
 340          UI    312.    148.     96.     96.     96.     96.     96.     96.      0.      0.
 341          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

342           KK    1502
343           KM          SUB-BASIN 1502
344           BA    1.02
345           LG     .35     .32    4.90     .24     .00
346           UI     70.    243.    388.    529.    825.    653.    478.    337.    171.    109.
347           UI     68.     21.     21.     21.      0.      0.      0.      0.      0.      0.
348           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

349           KK    15C1
350           HC       2

351           KK    15R1
352           RS      10    FLOW      -1
353           RL                      1     100
354           RC     .05     .05     .05   27657   .0101     110
355           RX       0     100    2592    2958    3325    3691    6184    6285
356           RY     106     104     102   100.1     100     102     104     106

357           KK    1503
358           KM          SUB-BASIN 1503
359           BA    5.18
360           LG     .33     .31    5.60     .21    4.00
361           UI    143.    143.    206.    496.    615.    727.    815.    912.   1047.   1197.
362           UI   1543.   1838.   1594.   1352.   1197.   1069.    923.    815.    707.    600.
363           UI    439.    281.    249.    235.    186.    143.    143.     72.     44.     44.
364           UI     44.     44.     44.     44.     44.     44.      0.      0.      0.      0.
365           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

366           KK    15C2
367           HC       2

368           KK    15R2A
369           RS       2    FLOW      -1
370           RL                      1     100
371           RC     .05     .05     .05    6537   .0092     105
372           RX       0     100    1107    1207    1307    1407    2414    2514
373           RY     106     104     102   100.1     100     102     104     106

374           KK    15R2B
375           RS       3    FLOW      -1
376           RL                      1     100
377           RC     .05     .05     .05    8548   .0094     105
378           RX       0     100     427     477     527     577     905    1005
379           RY     106     104     102   100.1     100     102     104     106

380           KK    1504
381           KM          SUB-BASIN 1504
382           BA     .80
383           LG     .35     .32    5.10     .21     .00
384           UI     42.     95.    190.    245.    310.    450.    485.    362.    285.    221.
385           UI    152.     79.     65.     42.     22.     13.     13.     13.     13.      0.
386           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
387           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 388          KK    15C3
 389          HC       2

 390          KK    15R3
 391          RS       2    FLOW      -1
 392          RL                      1     100
 393          RC     .05     .05     .05    5531   .0108     105
 394          RX       0     100    1032    1182    1332    1482    2414    2514
 395          RY     106     104     102   100.1     100     102     104     106

 396          KK    1505
 397          KM          SUB-BASIN 1505
 398          BA    3.13
 399          LG     .28     .27    7.00     .19   11.00
 400          UI    151.    285.    630.    820.   1009.   1304.   1860.   1528.   1220.    971.
 401          UI    768.    538.    292.    249.    155.    114.     46.     46.     46.     46.
 402          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 403          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 404          KK    1506
 405          KM          SUB-BASIN 1506
 406          BA    4.46
 407          LG     .27     .26    7.60     .16   13.00
 408          UI    238.    553.   1090.   1404.   1789.   2654.   2649.   1998.   1558.   1204.
 409          UI    777.    414.    336.    238.     87.     73.     73.     73.      0.      0.
 410          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 411          KK    15R4
 412          RS       3    FLOW      -1
 413          RL                      1     100
 414          RC     .05     .05     .05    8297   .0241     105
 415          RX       0     100    2468    3001    3535    4068    6437    6537
 416          RY     106     104     102   100.1     100     102     104     106

 417          KK    1507
 418          KM          SUB-BASIN 1507
 419          BA    2.49
 420          LG     .32     .29    6.40     .22    4.00
 421          UI    530.   1620.   2996.   2385.   1309.    467.    186.     89.      0.      0.
 422          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 423          KK    15C4
 424          HC       3

 425          KK    15R5
 426          RS       7    FLOW      -1
 427          RL                      1     100
 428          RC     .05     .05     .05   20114   .0149     105
 429          RX       0     100    3074    3874    4674    5474    8448    8548
 430          RY     106     104     102   100.1     100     102     104     106
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 431          KK   1508
 432          KM            SUB-BASIN 1508
 433          BA   5.48
 434          LG    .35     .34    4.20     .35     .00
 435          UI   240.    365.    920.   1223.   1464.   1796.   2441.   2968.   2286.   1889.
 436          UI  1527.   1235.    915.    521.    405.    308.    240.    110.     73.     73.
 437          UI    73.     73.      0.      0.      0.      0.      0.      0.      0.      0.
 438          UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 439          KK   15C5
 440          HC      2

 441          KK   15R6
 442          RS      7    FLOW     -1
 443          RL                    1     100
 444          RC    .05     .05     .05   20617   .0107     105
 445          RX      0     100    2115    2465    2815    3165    5180    5280
 446          RY    106     104     102   100.1     100     102     104     106

 447          KK   1509
 448          KM            SUB-BASIN 1509
 449          BA   3.93
 450          LG    .35     .34    4.30     .32     .00
 451          UI   150.    150.    515.    690.    837.    976.   1173.   1568.   1893.   1498.
 452          UI  1252.   1054.    876.    728.    520.    312.    255.    213.    150.    117.
 453          UI    46.     46.     46.     46.     46.     46.      0.      0.      0.      0.
 454          UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 455          KK   15C6
 456          HC      2

 457          KK   15R7A
 458          RS      2    FLOW     -1
 459          RL                    1     100
 460          RC    .05     .05     .05    6285   .0095     105
 461          RX      0     100     508     588     668     748    1157    1257
 462          RY    106     104     102   100.1     100     102     104     106

 463          KK   15R7B
 464          RS      3    FLOW     -1
 465          RL                    1     100
 466          RC    .05     .05     .05    7542   .0106     105
 467          RX      0     100     805     938    1072    1205    1911    2011
 468          RY    106     104     102   100.1     100     102     104     106

 469          KK   1510
 470          KM            SUB-BASIN 1510
 471          BA    .71
 472          LG    .35     .34    4.30     .32     .00
 473          UI    39.     96.    184.    237.    308.    464.    404.    311.    238.    179.
 474          UI    99.     66.     45.     29.     12.     12.     12.     12.      0.      0.
 475          UI    0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

476           KK    15C7
477           HC       2

478           KK    15R8
479           RS       3    FLOW      -1
480           RL                      1     100
481           RC     .05     .05     .05    7291   .0082     105
482           RX       0     100    1032    1182    1332    1482    2414    2514
483           RY     106     104     102   100.1     100     102     104     106

484           KK    1511
485           KM          SUB-BASIN 1511
486           BA     .48
487           LG     .35     .33    4.90     .27     .00
488           UI     67.    222.    355.    520.    336.    200.     83.     41.     14.     14.
489           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
490           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

491           KK    15C8
492           HC       3

493           KK    15R9
494           RS       4    FLOW      -1
495           RL                      1     100
496           RC     .05     .05     .05   12571   .0095     105
497           RX       0     100    1017    1177    1337    1497    2414    2514
498           RY     106     104     102   100.1     100     102     104     106

499           KK    1519
500           KM          SUB-BASIN 1519
501           BA     .94
502           LG     .35     .33    4.70     .30     .00
503           UI     42.     69.    166.    219.    264.    326.    461.    503.    384.    316.
504           UI    254.    204.    138.     76.     69.     43.     35.     13.     13.     13.
505           UI     13.     13.      0.      0.      0.      0.      0.      0.      0.      0.
506           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

507           KK   15C13
508           HC       2

509           KK   15R17
510           RS       1    FLOW      -1
511           RL                      1     100
512           RC     .05     .05     .05    2262   .0066     105
513           RX       0     100    1510    1676    1843    2009    3420    3520
514           RY     106     104     102   100.1     100     102     104     106

515           KK    1512
516           KM          SUB-BASIN 1512
517           BA    2.90
518           LG     .32     .30    6.10     .25    5.00
519           UI    144.    287.    617.    799.    993.   1332.   1768.   1375.   1103.    869.
520           UI    675.    418.    248.    203.    144.     64.     44.     44.     44.     44.
521           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 522          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 523          KK   15R10
 524          RS      12    FLOW      -1
 525          RL                      1     100
 526          RC     .05     .05     .05   33691   .0119     105
 527          RX       0     100    2059    2362    2666    2969    4928    5028
 528          RY     106     104     102   100.1     100     102     104     106

 529          KK    1513
 530          KM          SUB-BASIN 1513
 531          BA    6.67
 532          LG     .35     .35    4.00     .36     .00
 533          UI    184.    184.    266.    639.    791.    936.   1049.   1174.   1348.   1541.
 534          UI   1987.   2367.   2053.   1741.   1541.   1377.   1189.   1049.    911.    772.
 535          UI    565.    362.    320.    302.    240.    184.    184.     92.     56.     56.
 536          UI     56.     56.     56.     56.     56.     56.      0.      0.      0.      0.
 537          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 538          KK    15C9
 539          HC       2

 540          KK   15R11A
 541          RS       4    FLOW      -1
 542          RL                      1     100
 543          RC     .05     .05     .05   12571   .0095     105
 544          RX       0     100    2818    3118    3418    3718    6437    6537
 545          RY     106     104     102   100.1     100     102     104     106

 546          KK   15R11B
 547          RS       4    FLOW      -1
 548          RL                      1     100
 549          RC     .05     .05     .05   12571   .0095     105
 550          RX       0     100    1842    2290    2738    3186    4928    5028
 551          RY     106     104     102   100.1     100     102     104     106

 552          KK    1514
 553          KM          SUB-BASIN 1514
 554          BA    2.42
 555          LG     .30     .29    6.50     .24    9.00
 556          UI    315.   1066.   1668.   2580.   1737.   1091.    455.    259.     77.     69.
 557          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 558          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 559          KK   15R12
 560          RS      11    FLOW      -1
 561          RL                      1     100
 562          RC     .05     .05     .05   30422   .0131     105
 563          RX       0     100    2345    2625    2905    3185    5431    5531
 564          RY     106     104     102   100.1     100     102     104     106
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

565           KK    1515
566           KM            SUB-BASIN 1515
567           BA    5.40
568           LG     .35     .35    4.00     .36     .00
569           UI    148.    148.    206.    511.    631.    747.    838.    934.   1074.   1220.
570           UI   1574.   1880.   1682.   1422.   1254.   1123.    973.    860.    745.    639.
571           UI    477.    319.    261.    243.    212.    148.    148.     97.     45.     45.
572           UI     45.     45.     45.     45.     45.     45.     0.      0.      0.      0.
573           UI      0.      0.      0.      0.      0.      0.     0.      0.      0.      0.

574           KK   15C10
575           HC       2

576           KK  15R13A
577           RS       6    FLOW      -1
578           RL                      1     100
579           RC     .05     .05     .05   16594   .0096     105
580           RX       0     100    2818    3118    3418    3718    6437    6537
581           RY     106     104     102   100.1     100     102     104     106

582           KK  15R13B
583           RS       4    FLOW      -1
584           RL                      1     100
585           RC     .05     .05     .05   12571   .0095     105
586           RX       0     100    1842    2290    2738    3186    4928    5028
587           RY     106     104     102   100.1     100     102     104     106

588           KK    1516
589           KM            SUB-BASIN 1516
590           BA    1.89
591           LG     .30     .26    7.30     .17   11.00
592           UI    188.     690.   1045.   1736.   1488.   1003.    598.    271.    155.     49.
593           UI     49.      0.      0.      0.      0.      0.      0.      0.      0.      0.
594           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

595           KK    15R14
596           RS       5    FLOW      -1
597           RL                      1     100
598           RC     .05     .05     .05   15588   .0128     105
599           RX       0     100    1274    1514    1754    1994    3168    3268
600           RY     106     104     102   100.1     100     102     104     106

601           KK    1517
602           KM            SUB-BASIN 1517
603           BA    1.51
604           LG     .35     .35    4.00     .36     .00
605           UI      73.    137.    304.    396.    487.    629.    898.    737.    588.    468.
606           UI     371.    260.    141.    120.     75.     55.     22.     22.     22.     22.
607           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
608           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

609           KK   15C11
610           HC       2

611           KK   15R15A
612           RS       8    FLOW      -1
613           RL                      1     100
614           RC     .05     .05     .05   22628   .0097     105
615           RX       0     100    2818    3118    3418    3718    6437    6537
616           RY     106     104     102   100.1     100     102     104     106

617           KK   15R15B
618           RS       4    FLOW      -1
619           RL                      1     100
620           RC     .05     .05     .05   12571   .0095     105
621           RX       0     100    1842    2290    2738    3186    4928    5028
622           RY     106     104     102   100.1     100     102     104     106

623           KK    1518
624           KM          SUB-BASIN 1518
625           BA    6.61
626           LG     .35     .35    4.00     .36     .00
627           UI    167.    167.    167.    528.    669.    797.    904.    993.   1109.   1256.
628           UI   1433.   1833.   2160.   1907.   1630.   1445.   1312.   1149.   1021.    902.
629           UI    797.    671.    485.    312.    292.    275.    240.    167.    167.    137.
630           UI     51.     51.     51.     51.     51.     51.     51.     51.     51.      0.
631           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
632           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

633           KK   15C12
634           HC       4

635           KK   15R16
636           RS       1    FLOW      -1
637           RL                      1     100
638           RC     .05     .05     .05    2514   .0080     105
639           RX       0     100     806     939    1072    1205    1911    2011
640           RY     106     104     102   100.1     100     102     104     106

641           KK    1521
642           KM          SUB-BASIN 1521
643           BA     .34
644           LG     .35     .35    4.10     .37     .00
645           UI    275.    720.    268.     43.      0.      0.      0.      0.      0.      0.
646           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

647           KK   15C14
648           KM          SIPHON 10 - BUTTERFIELD
649           HC       3
```

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

650           KK    1520
651           KM            SUB-BASIN 1520
652           BA    1.09
653           LG     .35     .32    5.20     .20     .00
654           UI     51.     91.    208.    273.    332.    420.    611.    551.    432.    350.
655           UI    279.    213.    118.     87.     65.     51.     19.     16.     16.     16.
656           UI     16.      0.      0.      0.      0.      0.      0.      0.      0.      0.
657           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

658           KK   15R18
659           RS       1    FLOW      -1
660           RL                      1     100
661           RC     .05     .05     .05    1760   .0114     105
662           RX       0     100    1385    1635    1885    2135    3420    3520
663           RY     106     104     102   100.1     100     102     104     106

664           KK    1522
665           KM            SUB-BASIN 1522
666           BA     .27
667           LG     .35     .32    5.10     .22     .00
668           UI    125.    397.    356.    124.     29.      0.      0.      0.      0.      0.
669           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

670           KK   15C15
671           KM            PORTION OF FLOW TO SPILLUNDERS
672           HC       2

673           KK  C13-15
674           KM          COMBINE ALL OF BASINS 13, 14 AND 15 AT CANAL BERM
675           HC       4

676           KK  R13-15
              * KO     2
677           KM          COMBINED ROUTING FOR BASINS 13, 14 AND 15
              *         INCLUDES FLOW THROUGH SPILLWAYS 8, 9 AND 10
              *         AND THREE SPILLUNDERS IN BASIN 15
678           RS       1    ELEV   730.3
679           SV       0     1.1     2.0     6.3    32.0    89.4   176.1
680           SE   730.3     736     738     740     742     744     746
681           SQ       0      15      39      55     497    1110    1936    3159    4311    6555
682           SQ    8672
683           SE   730.3     732     734     736     738     739     740     741     742     743
684           SE     744
685           ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

 22        1101
             V
             V
 30        11R1
             .
             .
 36          .        1102
             .          .
             .          .
 44        11C1............
             V
             V
 46        11R2
             .
             .
 52          .        1103
             .          .
             .          .
 59        11C2............
             V
             V
 62      SPLWY6
             .
             .
 71          .        1201
             .          V
             .          V
 78          .        12R1
             .          .
             .          .
 84          .          .        1202
             .          .          .
             .          .          .
 91          .        12C1............
             .          V
             .          V
 93          .       12R2A
             .          V
             .          V
 99          .       12R2B
             .          .
             .          .
105          .          .        1203
             .          .          .
             .          .          .
114          .        12C2............
             .          V
             .          V
116          .        12R3
             .          .
             .          .
122          .          .        1204
             .          .          .
```

```
                .         .         .
129             .      12C3.............
                .         V
                .         V
132             .    SPLWY7
                .         .
                .         .
141             .         .      1301
                .         .         V
                .         .         V
149             .         .      13R1
                .         .         .
                .         .         .
155             .         .         .      1302
                .         .         .         .
                .         .         .         .
163             .         .      13C1............
                .         .         V
                .         .         V
165             .         .      13R2
                .         .         .
                .         .         .
171             .         .         .      1303
                .         .         .         V
                .         .         .         V
180             .         .         .      13R3
                .         .         .         .
                .         .         .         .
186             .         .         .         .      1304
                .         .         .         .         V
                .         .         .         .         V
193             .         .         .         .      13R4
                .         .         .         .         .
                .         .         .         .         .
199             .         .         .         .         .      1305
                .         .         .         .         .         .
                .         .         .         .         .         .
207             .         .      CD3.................................
                .         .         .
                .         .         .
211             .         .         .-------->   DIV3
209             .         .      D3
                .         .         V
                .         .         V
214             .         .    13R5A
                .         .         V
                .         .         V
220             .         .    13R5B
                .         .         .
                .         .         .
226             .         .         .      1306
                .         .         .         V
                .         .         .         V
233             .         .         .    13R6A
                .         .         .         V
                .         .         .         V
239             .         .         .    13R6B
                .         .         .         .
                .         .         .         .
245             .         .         .         .      1307
```

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                .         .         .         .         .
                .         .         .         .         .
255             .         .       13C2.......................
                .         .         V
                .         .         V
257             .         .       13R7
                .         .         .
                .         .         .
263             .         .         .       1308
                .         .         .         .
                .         .         .         .
269             .         .       13C3............
                .         .         .
                .         .         .
272             .         .         .       1401
                .         .         .         V
                .         .         .         V
279             .         .         .      14R1A
                .         .         .         V
                .         .         .         V
285             .         .         .      14R1B
                .         .         .         .
                .         .         .         .
291             .         .         .         .       1402
                .         .         .         .         .
                .         .         .         .         .
304             .         .         .         .         .          .<-------    DIV3
302             .         .         .         .         .        RD3
                .         .         .         .         .          V
                .         .         .         .         .          V
305             .         .         .         .         .       14R2A
                .         .         .         .         .          V
                .         .         .         .         .          V
311             .         .         .         .         .       14R2B
                .         .         .         .         .          .
                .         .         .         .         .          .
317             .         .         .       14C1.......................
                .         .         .         V
                .         .         .         V
319             .         .         .       14R3
                .         .         .         .
                .         .         .         .
325             .         .         .         .       1403
                .         .         .         .         .
                .         .         .         .         .
331             .         .         .       14C2............
                .         .         .         .
                .         .         .         .
334             .         .         .         .       1501
                .         .         .         .         .
                .         .         .         .         .
342             .         .         .         .         .        1502
                .         .         .         .         .          .
                .         .         .         .         .          .
349             .         .         .         .       15C1............
                .         .         .         .         V
                .         .         .         .         V
351             .         .         .         .       15R1
                .         .         .         .         .
                .         .         .         .         .
```

357 1503

366 15C2

368 15R2A

374 15R2B

380 1504

388 15C3

390 15R3

396 1505

404 1506

411 15R4

417 1507

423 15C4

425 15R5

431 1508

439 15C5

441 15R6

447 1509

455 15C6

457 15R7A

463 15R7B

469 1510

76 15C7

478 15R8

484 1511

491 15C8

493 15R9

499 1519

507 15C13

509 15R17

515 1512

523 15R10

529 1513

538 15C9

540 15R11A

546 15R11B

552 1514

559 15R12

565 1515

574 15C10

576 15R13A

```
582                                                  15R13B
                                                        .
                                                        .
88                                                      .      1516
                                                        .        V
                                                        .        V
595                                                     .      15R14
                                                        .        .
                                                        .        .
601                                                     .        .        1517
                                                        .        .          .
                                                        .        .          .
609                                                     .      15C11.........
                                                        .        V
                                                        .        V
611                                                     .      15R15A
                                                        .        V
                                                        .        V
617                                                     .      15R15B
                                                        .        .
                                                        .        .
623                                                     .        .        1518
                                                        .        .          .
                                                        .        .          .
633                                                 15C12.......................................
                                                      V
                                                      V
635                                                 15R16
                                                      .
                                                      .
641                                                   .      1521
                                                      .        .
                                                      .        .
647                                           15C14.......................
                                                .
                                                .
650                                                 1520
                                                      V
                                                      V
658                                                 15R18
                                                      .
                                                      .
664                                                   .      1522
                                                      .        .
                                                      .        .
670                                                 15C15.........
                                                      .
                                                      .
673                                       C13-15.................................
                                                V
                                                V
676                                       R13-15
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
* RUN DATE  11/23/1991  TIME  15:45:05 *
*                                      *
****************************************
```

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

```
                    GILA BEND CANAL FLOODPLAIN STUDY
                    FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
                    DONOHUE AND ASSOCIATES  PROJECT NO. 18099
                    DATE: 11-17-91
                    FILENAME: BFD.HC1
                    HYDRAULIC ANALYSIS FOR  BASINS 11 - 15
                              24-HOUR STORM

 10 IO        OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT         HYDROGRAPH TIME DATA
                     NMIN         10  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1    0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        145  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2    0  ENDING DATE
                   NDTIME       0000  ENDING TIME
                    ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL     .17 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

 11 JD        INDEX STORM NO. 1
                    STRM        4.20  PRECIPITATION DEPTH
                    TRDA         .01  TRANSPOSITION DRAINAGE AREA

 12 PI          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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

17 JD INDEX STORM NO. 2

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

18 JD INDEX STORM NO. 3

STRM 3.86 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

19 JD INDEX STORM NO. 4

STRM 3.78 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

20 JD INDEX STORM NO. 5

STRM 3.70 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

21 JD INDEX STORM NO. 6

STRM 3.57 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI 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	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.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						

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	1101	3964.	12.83	948.	256.	256.	5.20		
ROUTED TO	11R1	343.	14.83	48.	12.	12.	5.20		
HYDROGRAPH AT	1102	3037.	13.17	798.	203.	203.	5.64		
2 COMBINED AT	11C1	3000.	13.17	831.	211.	211.	10.84		
ROUTED TO	11R2	2656.	13.33	701.	175.	175.	10.84		
HYDROGRAPH AT	1103	567.	12.33	80.	20.	20.	.59		
2 COMBINED AT	11C2	2676.	13.33	773.	193.	193.	11.43		
ROUTED TO	SPLWY6	2523.	13.50	773.	193.	193.	11.43		
HYDROGRAPH AT	1201	4145.	12.50	777.	212.	212.	4.06		
ROUTED TO	12R1	2112.	13.33	358.	90.	90.	4.06		
HYDROGRAPH AT	1202	3738.	12.67	676.	175.	175.	4.66		
2 COMBINED AT	12C1	3720.	12.67	1024.	262.	262.	8.72		
ROUTED TO	12R2A	3024.	13.17	742.	185.	185.	8.72		
ROUTED TO	12R2B	755.	15.00	145.	36.	36.	8.72		
HYDROGRAPH AT	1203	3580.	13.50	1082.	270.	270.	8.89		
2 COMBINED AT	12C2	3427.	13.50	1150.	287.	287.	17.61		
ROUTED TO	12R3	2757.	13.67	862.	215.	215.	17.61		
HYDROGRAPH AT	1204	623.	12.33	75.	19.	19.	.61		
2 COMBINED AT	12C3	2757.	13.67	931.	233.	233.	18.22		
ROUTED TO	SPLWY7	2635.	13.83	927.	232.	232.	18.22		
HYDROGRAPH AT	1301	3034.	13.00	758.	216.	216.	5.13		
ROUTED TO	13R1	1985.	14.17	609.	153.	153.	5.13		
HYDROGRAPH AT	1302	2841.	13.33	816.	219.	219.	5.98		
2 COMBINED AT	13C1	3358.	14.00	1392.	366.	366.	11.11		
ROUTED TO	13R2	3058.	14.50	1308.	333.	333.	11.11		
HYDROGRAPH AT	1303	2238.	13.50	732.	195.	195.	4.43		

ROUTED TO	13R3	1796.	14.33	645.	162.	162.	4.43
HYDROGRAPH AT	1304	2430.	12.33	362.	98.	98.	1.89
ROUTED TO	13R4	958.	14.00	237.	59.	59.	1.89
HYDROGRAPH AT	1305	3610.	13.00	829.	217.	217.	6.26
4 COMBINED AT	CD3	5570.	14.17	2775.	719.	719.	23.69
DIVERSION TO	DIV3	2417.	14.17	1027.	265.	265.	23.69
HYDROGRAPH AT	D3	3153.	14.17	1748.	454.	454.	23.69
ROUTED TO	13R5A	2766.	15.33	1451.	371.	371.	23.69
ROUTED TO	13R5B	2542.	16.17	1296.	334.	334.	23.69
HYDROGRAPH AT	1306	2539.	12.67	522.	139.	139.	3.32
ROUTED TO	13R6A	1076.	14.50	315.	79.	79.	3.32
ROUTED TO	13R6B	682.	15.83	237.	59.	59.	3.32
HYDROGRAPH AT	1307	2886.	14.00	1064.	269.	269.	9.10
3 COMBINED AT	13C2	3383.	16.17	2185.	616.	616.	36.11
ROUTED TO	13R7	3330.	16.17	2165.	609.	609.	36.11
HYDROGRAPH AT	1308	363.	12.00	35.	9.	9.	.30
2 COMBINED AT	13C3	3330.	16.17	2165.	617.	617.	36.41
HYDROGRAPH AT	1401	2010.	12.67	383.	105.	105.	2.38
ROUTED TO	14R1A	627.	13.50	110.	27.	27.	2.38
ROUTED TO	14R1B	0.	.17	0.	0.	0.	2.38
HYDROGRAPH AT	1402	2021.	14.50	889.	230.	230.	7.54
HYDROGRAPH AT	RD3	2417.	14.17	1027.	265.	265.	23.69
ROUTED TO	14R2A	768.	15.67	190.	48.	48.	23.69
ROUTED TO	14R2B	42.	17.50	6.	2.	2.	23.69
3 COMBINED AT	14C1	2021.	14.50	929.	241.	241.	9.92
ROUTED TO	14R3	1882.	14.67	880.	226.	226.	9.92
HYDROGRAPH AT	1403	418.	12.00	36.	9.	9.	.28
2 COMBINED AT	14C2	1882.	14.67	893.	234.	234.	10.20
HYDROGRAPH AT	1501	4123.	13.33	1166.	305.	305.	8.79
HYDROGRAPH AT	1502	823.	12.50	136.	34.	34.	1.02

2 COMBINED AT	15C1	4266.	13.33	1297.	337.	337.	9.81
ROUTED TO	15R1	2580.	15.17	945.	237.	237.	9.81
HYDROGRAPH AT	1503	2123.	13.67	734.	190.	190.	5.18
2 COMBINED AT	15C2	3140.	15.00	1553.	411.	411.	14.99
ROUTED TO	15R2A	2822.	15.50	1506.	396.	396.	14.99
ROUTED TO	15R2B	2653.	16.00	1465.	386.	386.	14.99
HYDROGRAPH AT	1504	556.	12.83	112.	28.	28.	.80
2 COMBINED AT	15C3	2653.	16.00	1505.	412.	412.	15.79
ROUTED TO	15R3	2551.	16.33	1456.	396.	396.	15.79
HYDROGRAPH AT	1505	2100.	12.83	494.	134.	134.	3.13
HYDROGRAPH AT	1506	3397.	12.83	743.	203.	203.	4.46
ROUTED TO	15R4	2727.	13.17	639.	160.	160.	4.46
HYDROGRAPH AT	1507	2865.	12.17	345.	89.	89.	2.49
3 COMBINED AT	15C4	4605.	13.00	1459.	378.	378.	10.08
ROUTED TO	15R5	3050.	14.33	1019.	255.	255.	10.08
HYDROGRAPH AT	1508	2814.	13.00	644.	161.	161.	5.48
2 COMBINED AT	15C5	3251.	14.33	1578.	398.	398.	15.56
ROUTED TO	15R6	2561.	15.50	1259.	320.	320.	15.56
HYDROGRAPH AT	1509	1867.	13.17	477.	119.	119.	3.93
2 COMBINED AT	15C6	2561.	15.50	1588.	427.	427.	19.49
ROUTED TO	15R7A	2443.	16.00	1535.	414.	414.	19.49
ROUTED TO	15R7B	2354.	16.33	1473.	397.	397.	19.49
HYDROGRAPH AT	1510	454.	12.83	88.	22.	22.	.71
2 COMBINED AT	15C7	2354.	16.33	1488.	418.	418.	20.20
ROUTED TO	15R8	2239.	16.83	1425.	396.	396.	20.20
HYDROGRAPH AT	1511	482.	12.33	62.	15.	15.	.48
3 COMBINED AT	15C8	4342.	16.50	2663.	750.	750.	36.47
ROUTED TO	15R9	4032.	17.33	2535.	704.	704.	36.47
HYDROGRAPH AT	1519	521.	13.00	117.	29.	29.	.94
2 COMBINED AT	15C13	4032.	17.33	2538.	730.	730.	37.41

ROUTED TO	15R17	3957.	17.50	2507.	718.	718.	37.41
HYDROGRAPH AT	1512	1804.	12.83	393.	103.	103.	2.90
ROUTED TO	15R10	431.	16.17	148.	37.	37.	2.90
HYDROGRAPH AT	1513	2321.	13.67	777.	195.	195.	6.67
2 COMBINED AT	15C9	2311.	13.67	896.	230.	230.	9.57
ROUTED TO	15R11A	1669.	14.67	736.	189.	189.	9.57
ROUTED TO	15R11B	1139.	16.00	532.	136.	136.	9.57
HYDROGRAPH AT	1514	2457.	12.33	348.	94.	94.	2.42
ROUTED TO	15R12	529.	15.00	160.	40.	40.	2.42
HYDROGRAPH AT	1515	1865.	13.67	630.	158.	158.	5.40
2 COMBINED AT	15C10	1856.	13.67	780.	196.	196.	7.82
ROUTED TO	15R13A	1283.	15.17	593.	150.	150.	7.82
ROUTED TO	15R13B	887.	16.83	411.	103.	103.	7.82
HYDROGRAPH AT	1516	1918.	12.50	307.	83.	83.	1.89
ROUTED TO	15R14	875.	13.50	220.	55.	55.	1.89
HYDROGRAPH AT	1517	834.	12.83	179.	45.	45.	1.51
2 COMBINED AT	15C11	1292.	13.33	396.	99.	99.	3.40
ROUTED TO	15R15A	565.	15.67	209.	52.	52.	3.40
ROUTED TO	15R15B	216.	17.67	81.	20.	20.	3.40
HYDROGRAPH AT	1518	2138.	13.83	765.	193.	193.	6.61
4 COMBINED AT	15C12	1957.	13.83	1374.	395.	395.	27.40
ROUTED TO	15R16	1866.	14.00	1355.	389.	389.	27.40
HYDROGRAPH AT	1521	468.	12.00	40.	10.	10.	.34
3 COMBINED AT	15C14	4971.	17.33	3411.	1033.	1033.	65.15
HYDROGRAPH AT	1520	690.	13.00	154.	39.	39.	1.09
ROUTED TO	15R18	640.	13.00	146.	37.	37.	1.09
HYDROGRAPH AT	1522	371.	12.17	37.	9.	9.	.27
2 COMBINED AT	15C15	641.	13.00	182.	46.	46.	1.36
4 COMBINED AT	C13-15	7591.	16.50	5739.	1738.	1738.	113.12
ROUTED TO	R13-15	7551.	16.67	5734.	1737.	1737.	113.12

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:01:26.01 (86.01 Seconds)
NORMAL END OF HEC-1

HEC1 S/N: HMVersion: 6.00 Data File: GTZ.HC1

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
* RUN DATE  11/18/1991  TIME  04:54:46 *
*                                      *
****************************************
```

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

```
::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
:::                                  :::
:::  Full Microcomputer Implementation :::
:::                by                :::
:::       Haestad Methods, Inc.      :::
:::                                  :::
::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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            GILA BEND CANAL FLOODPLAIN STUDY
  2           ID            FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  3           ID            DONOHUE AND ASSOCIATES  PROJECT NO. 18099
  4           ID            DATE: 10-18-91
  5           ID            FILENAME: GTZ.HC1
  6           ID            HYDRALIC ANALYSIS FOR  BASINS 16 - 18
  7           ID                      24-HOUR STORM
  8           IT      10                    145
  9           IO       5
 10           IN      30
              *DIAGRAM
 11           JD    4.20     .01
 12           PC    .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
 13           PC    .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
 14           PC    .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
 15           PC    .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
 16           PC    .952    .959    .965    .972    .978    .984    .989    .995   1.000
 17           JD    3.99    10.0
 18           JD    3.86    20.0
 19           JD    3.78    30.0
 20           JD    3.70    50.0
 21           JD    3.57   100.0
              *  BASIN NO. 16

 22           KK    1601
 23           KM            SUB-BASIN 1601
 24           BA    3.79
 25           LG     .33     .30    5.80     .20    5.00
 26           UI    173.    291.    686.    907.   1097.   1364.   1955.   1998.   1536.   1260.
 27           UI   1009.    798.    510.    302.    267.    173.    119.     53.     53.     53.
 28           UI     53.     53.      0.      0.      0.      0.      0.      0.      0.      0.
 29           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 30           KK      D4          DIVERT FLOW TO BASIN 17
 31           DT    DIV4
 32           DI       0     300    2600    3800    7850
 33           DQ       0      60     360     620    1520

 34           KK    16R1
 35           RS       3    FLOW      -1
 36           RL                      5     100
 37           RC     .05     .05     .05    9051   .0088     105
 38           RX       0     100    1815    2198    2581    2964    4678    4777
 39           RY     106     104     102   100.1     100     102     104     106

 40           KK    1602
 41           KM            SUB-BASIN 1602
 42           BA    1.62
 43           LG     .35     .32    5.20     .20     .00
 44           UI    100.    298.    516.    675.    992.   1142.    820.    612.    438.    218.
 45           UI    154.    100.     36.     31.     31.     31.      0.      0.      0.      0.
 46           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

  47          KK    16C1
  48          HC       2

  49          KK    16R2
  50          RS       2    FLOW      -1
  51          RL                      5     100
  52          RC     .05     .05     .05    6537   .0092     105
  53          RX       0     100    1032    1182    1332    1482    2414    2514
  54          RY     106     104     102   100.1     100     102     104     106

  55          KK    1603
  56          KM          SUB-BASIN 1603
  57          BA     .56
  58          LG     .35     .33    4.80     .30     .00
  59          UI     78.    264.    414.    640.    431.    270.    113.     64.     19.     17.
  60          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  61          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  62          KK    16C2
  63          HC       2

  64          KK    16R3
  65          RS       1    FLOW      -1
  66          RL                      5     100
  67          RC     .05     .05     .05    2765   .0072     105
  68          RX       0     100     730     830     930    1030    1660    1760
  69          RY     106     104     102   100.1     100     102     104     106

  70          KK    1605
  71          KM   SUB-BASIN 1605
  72          BA    2.99
  73          LG     .35     .32    5.10     .22     .00
  74          UI    115.    115.    393.    526.    639.    745.    895.   1197.   1445.   1144.
  75          UI    956.    804.    668.    556.    397.    238.    195.    163.    115.     89.
  76          UI     35.     35.     35.     35.     35.     35.      0.      0.      0.      0.
  77          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  78          KK    16R4
  79          RS       3    FLOW      -1
  80          RL                      5     100
  81          RC     .05     .05     .05    9051   .0099     105
  82          RX       0     100    2190    2406    2622    2838    4928    5028
  83          RY     106     104     102   100.1     102     104     106

  84          KK    1606
  85          KM          SUB-BASIN 1606
  86          BA    2.06
  87          LG     .35     .33    4.90     .27     .00
  88          UI    141.    477.    771.   1038.   1638.   1371.   1004.    726.    394.    238.
  89          UI    144.     61.     43.     43.      0.      0.      0.      0.      0.      0.
  90          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 91           KK    16C3
 92           HC       2

 93           KK    16R5
 94           RS       1    FLOW      -1
 95           RL                      5     100
 96           RC     .05     .05     .05    2514     .008     105
 97           RX       0     100     730     830     930    1030    1660    1760
 98           RY     106     104     102   100.1     100     102     104     106

 99           KK    1604
100           KM           SUB-BASIN 1604
101           BA     .16
102           LG     .35     .33    4.80     .28     .00
103           UI    446.   1320.    740.    159.     43.      0.      0.      0.      0.      0.
104           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

105           KK    1607
106           KM           SUB-BASIN 1607
107           BA     .36
108           LG     .35     .32    5.00     .24     .00
109           UI    206.    647.    500.    148.     34.      0.      0.      0.      0.      0.
110           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

111           KK    16C4
112           KM           TOTAL FLOW FOR BASIN 16
113           HC       4

114           KK  SPWY11
              * KO     1
115           KM          SPILLWAY AT SIPHON 11 - GETZWEILLER
              *         ROUTE BASIN 16 THRU RES. 3 AND SPILLWAY 11
116           RS       1    ELEV     735
117           SV    0.01    0.68    2.80   13.80    40.3    98.4   208.6   372.5     593
118           SE     735     736     738     740     742     744     746     748     750
119           SQ       0      35     132     435     859    1394    2035    2782    3635    4594
120           SE   737.1   737.5     738     739     740     741     742     743     744     745
              *  BASIN NO. 17

121           KK    1701
122           KM           SUB-BASIN 1701
123           BA    7.09
124           LG     .35     .32    4.80     .27     .00
125           UI    191.    191.    246.    655.    806.    954.   1073.   1193.   1361.   1535.
126           UI   1935.   2408.   2270.   1896.   1665.   1500.   1304.   1153.   1002.    891.
127           UI    678.    486.    338.    322.    314.    200.    191.    185.     59.     59.
128           UI     59.     59.     59.     59.     59.     59.     59.      0.      0.      0.
129           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 130          KK     RD4
 131          KM            RETRIEVE FLOW DIVERTED FROM BASIN 16
 132          DR    DIV4

 133          KK    17R1
 134          RS       6    FLOW      -1
 135          RL                       5     100
 136          RC     .05     .05     .05   17100   .0082     105
 137          RX       0     100    2215    2415    2615    2815    4930    5030
 138          RY     106     104     102   100.1     100     102     104     106

 139          KK    17C1
 140          HC       2

 141          KK    17R2
 142          RS       1    FLOW      -1
 143          RL                       5     100
 144          RC     .05     .05     .05    2765   .0072     105
 145          RX       0     100    1007    1174    1340    1507    2414    2514
 146          RY     106     104     102   100.1     100     102     104     106

 147          KK    1702
 148          KM            SUB-BASIN 1702
 149          BA     .50
 150          LG     .35     .34    4.50     .35     .00
 151          UI    192.    579.    725.    310.     94.     23.      0.      0.      0.      0.
 152          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 153          KK    17C2
 154          KM    TOTAL FLOW FROM BASIN 17
 155          HC       2
              *  BASIN NO. 18

 156          KK    1801
 157          KM            SUB-BASIN 1801
 158          BA    1.64
 159          LG     .35     .32    5.10     .22     .00
 160          UI     91.    237.    441.    567.    756.   1110.    879.    678.    514.    362.
 161          UI    186.    140.     91.     40.     28.     28.     28.      0.      0.      0.
 162          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 163          KK    18R1
 164          RS       1    FLOW      -1
 165          RL                       5   737.8
 166          RC     .05     .05     .05    2100   .0086     742
 167          RX       0     150     300     320     360     380     520     570
 168          RY     742     740   742.8   737.8   737.8   742.8     740     742

 169          KK    1802
 170          KM            SUB-BASIN 1802
 171          BA     .21
 172          LG     .35     .33    4.70     .29     .00
 173          UI    162.    423.    158.     25.      0.      0.      0.      0.      0.      0.
 174          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 175          KK    18C1
 176          KM     COMBINE FLOW FROM BASIN 18
 177          HC       2

 178          KK  C17-18
 179          KM     COMBINE FLOW FROM BASINS 17 AND 18
 180          HC       2

 181          KK   RTE18
              * KO     1
 182          KM         ROUTE IN RES. 1 AND 2 THROUGH SPILLUNDERS IN BASIN 18
 183          RS       1    ELEV   730.7
 184          SV       0     0.5     1.8     8.1      41     122     293     545     860    1215
 185          SE   730.7     734     736     738     740     742     744     746     748     750
 186          SQ       0     7.7    14.2     164     273     365     441     507     571     580
 187          SQ     872    2595
 188          SE   730.7   731.7   732.7   734.7   736.7   738.7   740.7   742.7     745   745.2
 189          SE   745.7   746.7
 190          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

22         1601
             .
             .
31           .------->    DIV4
30         D4
           V
           V
34         16R1
             .
             .
40           .        1602
             .          .
             .          .
47         16C1............
           V
           V
49         16R2
             .
             .
55           .        1603
             .          .
             .          .
62         16C2............
           V
           V
64         16R3
             .
             .
70           .        1605
             .          V
             .          V
78           .        16R4
             .          .
             .          .
84           .          .        1606
             .          .          .
             .          .          .
91           .        16C3............
             .          V
             .          V
93           .        16R5
             .          .
             .          .
99           .          .        1604
             .          .          .
             .          .          .
105          .          .          .        1607
             .          .          .          .
             .          .          .          .
11         16C4.................................
           V
           V
114      SPWY11
```

```
                .
                .
121             .        1701
                .          .
                .          .
132             .          .          .<-------    DIV4
130             .          .        RD4
                .          .          V
                .          .          V
133             .          .        17R1
                .          .          .
                .          .          .
139             .        17C1............
                .          V
                .          V
141             .        17R2
                .          .
                .          .
147             .          .        1702
                .          .          .
                .          .          .
153             .        17C2............
                .          .
                .          .
156             .          .        1801
                .          .          V
                .          .          V
163             .          .        18R1
                .          .          .
                .          .          .
169             .          .          .        1802
                .          .          .          .
                .          .          .          .
175             .          .        18C1............
                .          .          .
                .          .          .
178             .      C17-18............
                .          V
                .          V
181             .       RTE18
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*          SEPTEMBER 1990              *
*           VERSION 4.0                *
*                                      *
* RUN DATE  11/18/1991  TIME  04:54:46 *
*                                      *
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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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GILA BEND CANAL FLOODPLAIN STUDY
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
DONOHUE AND ASSOCIATES PROJECT NO. 18099
DATE: 10-18-91
FILENAME: GTZ.HC1
HYDRALIC ANALYSIS FOR BASINS 16 - 18
24-HOUR STORM

```
 9 IO        OUTPUT CONTROL VARIABLES
                  IPRNT          5  PRINT CONTROL
                  IPLOT          0  PLOT CONTROL
                  QSCAL         0.  HYDROGRAPH PLOT SCALE

 IT          HYDROGRAPH TIME DATA
                   NMIN         10  MINUTES IN COMPUTATION INTERVAL
                  IDATE     1    0  STARTING DATE
                  ITIME       0000  STARTING TIME
                     NQ        145  NUMBER OF HYDROGRAPH ORDINATES
                 NDDATE     2    0  ENDING DATE
                 NDTIME       0000  ENDING TIME
                  ICENT         19  CENTURY MARK

            COMPUTATION INTERVAL     .17 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

11 JD        INDEX STORM NO. 1
                  STRM        4.20  PRECIPITATION DEPTH
                  TRDA         .01  TRANSPOSITION DRAINAGE AREA

12 PI          PRECIPITATION PATTERN
                 .00      .00      .00      .00      .00      .00      .00      .00      .00      .00
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.13	.13	.02	.02	.02	.01	.01	.01	.01	.01
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17 JD INDEX STORM NO. 2

STRM 3.99 PRECIPITATION DEPTH

TRDA 10.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.01	.01	.01	.01	.01
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18 JD INDEX STORM NO. 3

STRM 3.86 PRECIPITATION DEPTH

TRDA 20.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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19 JD INDEX STORM NO. 4

STRM 3.78 PRECIPITATION DEPTH

TRDA 30.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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20 JD INDEX STORM NO. 5

STRM 3.70 PRECIPITATION DEPTH

TRDA 50.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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.01	.01	.01	.01	.01	.01	.02	.02	.02	.13
.13	.13	.02	.02	.02	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
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.00	.00	.00	.00						

21 JD INDEX STORM NO. 6

STRM 3.57 PRECIPITATION DEPTH

TRDA 100.00 TRANSPOSITION DRAINAGE AREA

0 PI PRECIPITATION PATTERN

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.13	.13	.02	.02	.02	.01	.01	.01	.01	.01
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	1601	2383.	13.00	558.	145.	145.	3.79		
DIVERSION TO	DIV4	332.	13.00	84.	22.	22.	3.79		
HYDROGRAPH AT	D4	2052.	13.00	474.	123.	123.	3.79		
ROUTED TO	16R1	867.	13.83	181.	45.	45.	3.79		
HYDROGRAPH AT	1602	1265.	12.67	225.	56.	56.	1.62		
2 COMBINED AT	16C1	1248.	12.67	401.	100.	100.	5.41		
ROUTED TO	16R2	774.	13.83	285.	71.	71.	5.41		
HYDROGRAPH AT	1603	574.	12.33	74.	19.	19.	.56		
2 COMBINED AT	16C2	808.	13.17	356.	89.	89.	5.97		
ROUTED TO	16R3	729.	13.33	316.	79.	79.	5.97		
HYDROGRAPH AT	1605	1575.	13.17	407.	102.	102.	2.99		
ROUTED TO	16R4	1536.	13.33	406.	102.	102.	2.99		
HYDROGRAPH AT	1606	1581.	12.50	264.	66.	66.	2.06		
2 COMBINED AT	16C3	2288.	12.67	665.	166.	166.	5.05		
ROUTED TO	16R5	2048.	12.83	621.	155.	155.	5.05		
HYDROGRAPH AT	1604	1001.	12.00	90.	23.	23.	.16		
HYDROGRAPH AT	1607	555.	12.00	54.	13.	13.	.36		
4 COMBINED AT	16C4	2609.	12.83	1051.	263.	263.	11.54		
ROUTED TO	SPWY11	2438.	13.50	1047.	262.	262.	11.54		
HYDROGRAPH AT	1701	2573.	13.67	888.	223.	223.	7.09		
HYDROGRAPH AT	RD4	332.	13.00	84.	22.	22.	3.79		
ROUTED TO	17R1	0.	.17	0.	0.	0.	3.79		
2 COMBINED AT	17C1	2573.	13.67	888.	223.	223.	7.09		
ROUTED TO	17R2	2333.	13.83	803.	201.	201.	7.09		
HYDROGRAPH AT	1702	602.	12.17	59.	15.	15.	.50		
2 COMBINED AT	17C2	2333.	13.83	859.	215.	215.	7.59		

HYDROGRAPH AT	1801	1144.	12.67	218.	54.	54.	1.64
ROUTED TO	18R1	1060.	12.83	210.	52.	52.	1.64
HYDROGRAPH AT	1802	295.	12.00	25.	6.	6.	.21
2 COMBINED AT	18C1	1060.	12.83	235.	59.	59.	1.85
2 COMBINED AT	C17-18	2486.	13.83	1085.	272.	272.	9.44
ROUTED TO	RTE18	557.	15.50	541.	254.	254.	9.44

*** NORMAL END OF HEC-1 ***
Elapsed Time - 00:00:17.19 (17.19 Seconds)
NORMAL END OF HEC-1

I.D. Number	Elevation (ft.)	Description/Location
ERM 47	749.44	United States Coast and Geodetic Survey brass cap in concrete stamped S-361 1967, 17.6 miles north Jct. Old US 80-SR 85, 3.85 miles north Patterson Road to station on left.
ERM 48	749.42	Chiseled 2-inch square concrete pad in northeast leg of high voltage transmission tower, 17.6 miles north Jct. Old US 80-SR 85, 4.4 miles north Patterson Road, 245 feet left of centerline of Old US 80.
ERM 49	751.25	United States Coast and Geodetic Survey brass cap stamped T-361 1967, northeast corner concrete pad of El Paso Natural Gas pipeline bridge, 22.4 miles north Jct. Old US 80-SR 85 to station on left.

51M/GI/AH7

I.D. Number	Elevation (ft.)	Description/Location
ERM 38	743.36	30-inch 5/8-inch rebar in concrete 0.5 feet below ground, 13.3 miles north Jct. Old US 80-SR 85, 3.55 miles north Woods Road, 50 feet west of centerline Old US 80 to station.
ERM 39	749.19	National Geodetic Survey brass cap in northeast corner of concrete pump pad, stamped A476 1981, 17.6 miles north Jct. Old US 80-SR 85 to station on left.
ERM 40	747.64	30-inch 5/8-inch rebar in concrete 0.5 feet below ground, 17.6 miles north Jct. Old US 80-SR 85, 0.55 miles north Patterson Road, 50 feet west of centerline Old US 80 to station.
ERM 41	747.65	United States Coast and Geodetic Survey brass cap in 6-inch steel pipe stamped Q-361 1967, 17.6 miles north Jct. Old US 80-SR 85, 1 mile north Patterson Road, 50 feet west of centerline Old US 80 to station.
ERM 42	744.98	Bureau Land Management brass cap on 3-inch pipe stamped T2S,R5W, Section 36, 1 and 6, T3S 1958, 17.6 miles north Jct. Old US 80-SR 85, 1.65 miles Patterson Road, 250 feet west of centerline Old US 80 to station.
ERM 43	748.28	United States Coast and Geodetic Survey brass cap in concrete stamped R-13 1927, 17.6 miles north Jct. Old US 80-SR 85, 1.9 miles north Patterson Road, 50 feet west of centerline Old US 80 to station.
ERM 44	749.93	Chiseled 2-inch square in northwest corner of concrete pump pad, 17.6 miles north Jct. Old US 80-SR 85, 2.2 miles north Patterson Road to pump and station on right.
ERM 45	747.73	United States Coast and Geodetic Survey brass cap in concrete stamped R-361 1967, 17.6 miles north Jct. Old US 80-SR 85, 2.8 miles north Patterson Road, 50 feet west of centerline Old US 80 to station.
ERM 46	754.60	Chiseled 2-inch square in southeast corner of concrete pump pad, 17.6 miles north Jct. Old US 80-SR 85, 3.2 miles north Patterson Road to pump and station on right.

I.D. Number	Elevation (ft.)	Description/Location
ERM 29	741.15	Government Land Office brass cap on 3-inch pipe, 1 foot above ground, section corner 33, 34, 3 and 4 in T3S R4W, 12.25 miles north Jct. Old US 80-SR 85, 145 feet east from centerline Old US 80 to station.
ERM 30	736.22	United States Coast and Geodetic Survey brass cap stamped K-361 1967, in a 6-inch steel pipe, 12.65 miles north Jct. Old US 80-SR 85, 60 feet east of centerline of Old US 80 to station.
ERM 31	742.44	United States Coast and Geodetic Survey brass cap in concrete post stamped T-13 1967, 13.3 miles north Jct. Old US 80-SR 85, 190 feet east of centerline Old US 80 to station.
ERM 32	747.57	Chiseled 2-inch square in southeast corner of concrete pump pad, 13.3 miles north Jct. Old US 80-SR 85, 0.65 miles north of Woods Road, 320 feet east of centerline Old US 80 to well and station.
ERM 33	741.83	United States Coast and Geodetic Survey brass cap in concrete stamped L-361 1967, 13.3 miles north Jct. Old US 80-SR 85, 1 mile north Woods Road, 0.45 feet east of centerline Old US 80 to station.
ERM 34	746.80	Chiseled 2-inch square in southwest corner of concrete pump pad, 13.3 miles north Jct. Old US 80-SR 85, 1.4 miles north Woods Road, 62 feet east of centerline Old US 80 to well and station.
ERM 35	745.32	United States Coast and Geodetic Survey brass cap in concrete stamped M-361 1967, 13.3 miles north Jct. Old US 80-SR 85, 2.1 miles north Woods Road, 90 feet west of centerline old US 80 to station.
ERM 36	743.36	30-inch 5/8-inch rebar in concrete 0.5 feet below ground, 13.3 miles north Jct. Old US 80-SR 85, 2.55 miles north Woods Road, 15 feet west of centerline Old US 80 to station.
ERM 37	744.91	United States Coast and Geodetic Survey brass cap in concrete stamped N-361 1967, 13.3 miles north Jct. Old US 80-SR 85, 3.05 miles north 50 feet west of centerline Old US 80 to station.

I.D. Number	Elevation (ft.)	Description/Location
ERM 20	750.84	Chiseled 2-inch square in middle south siphon headwall, 6.85 miles north Jct. Old US 80-SR 85, dirt road 0.85 miles east, 1.15 miles north along canal to siphon headwall and station.
ERM 21	746.76	Chiseled 2-inch square in northeast corner of concrete pad, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.05 miles east, 1.7 miles north to well and station.
ERM 22	752.06	Chiseled 2-inch square in west and south siphon headwall, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.85 miles east, 2.2 miles north along canal to siphon headwall and station.
ERM 23	738.52	30-inch rebar set in concrete 0.5 foot below ground, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.85 miles east, 2.7 miles north along canal to station on left.
ERM 24	742.05	Chiseled 2-inch square in northeast corner of concrete pump pad, 10.2 miles north Jct. Old US 80-SR 85, Pierpont Road 0.25 miles east to a "T" intersection, 0.15 miles south to canal, 0.55 miles south to well and station.
ERM 25	750.67	Chiseled 2-inch square in northeast corner of concrete pump pad, 10.2 miles north Jct. Old US 80-SR 85, Pierpont Road .25 miles east to a "T" intersection, 0.15 miles south to canal, well and station.
ERM 26	751.01	Chiseled 2-inch square in northeast corner of concrete pump pad, 10.2 miles north Jct. Old US 80-SR 85, Pierpont Road 0.25 miles east to a "T" intersection, 0.15 miles south to canal, 0.55 miles north to well and station.
ERM 27	751.76	Chiseled 2-inch square in northeast corner of concrete pump pad, 11.35 miles north Jct. Old US 80-SR 85, dirt road, 0.20 miles east to lift station, well, and station.
ERM 28	746.89	Chiseled 2-inch square in northeast corner of concrete pump pad, 11.75 miles north Jct. Old US 80-SR 85, dirt road 300 feet east to canal, well, and station.

I.D. Number	Elevation (ft.)	Description/Location
ERM 10	733.70	United States Coast and Geodetic Survey brass cap stamped B-361, 1967, 3.3 miles north Jct. Old US 80-SR 85, 50 feet west Old US 80.
ERM 11	739.16	Chiseled 2-inch square in northwest corner of concrete pump pad, 4.0 miles north Jct. Old US 80-SR 85, 250 feet east of centerline Old US 80 to well and station.
ERM 12	737.96	National Geodetic Survey Vertical Control Mark stamped G-476, 1981, northwest corner concrete pump pad, 4.4 miles north Jct. Old US 80-SR 85, 400 feet east to well and station.
ERM 13	739.53	Chiseled 2-inch square in northwest corner of concrete pump pad, 4.9 miles north Jct. Old US 80-SR 85, dirt road 0.25 miles east to well site.
ERM 14	742.88	Chiseled 2-inch square in northwest corner of concrete pump pad, 5.3 miles north Jct. Old US 80-SR 85, dirt road 0.45 miles east, south 0.10 miles along canal to pump and station.
ERM 15	742.30	Chiseled 2-inch square in northwest corner of concrete pump pad, 5.9 miles north Jct. Old US 80-SR 85, dirt road, 0.5 miles east, 0.1 miles south along canal to well and station.
ERM 16	742.60	Chiseled 2-inch square in northeast corner of concrete pump pad, 5.95 miles north Jct. Old US 80-SR 85, field road 0.6 miles east, 0.4 miles north along canal to well and station.
ERM 17	743.89	Chiseled 2-inch square in southwest corner of concrete pump pad, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.85 miles east to canal and station.
ERM 18	747.32	Chiseled 2-inch square in northeast corner of concrete pump pad, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.85 miles east, 0.3 miles north along canal to well and station.
ERM 19	740.57	Chiseled 2-inch square in southeast of concrete pump pad, 6.85 miles north Jct. Old US 80-SR 85, dirt road, 0.85 miles east, 0.65 miles north along canal to well and station.

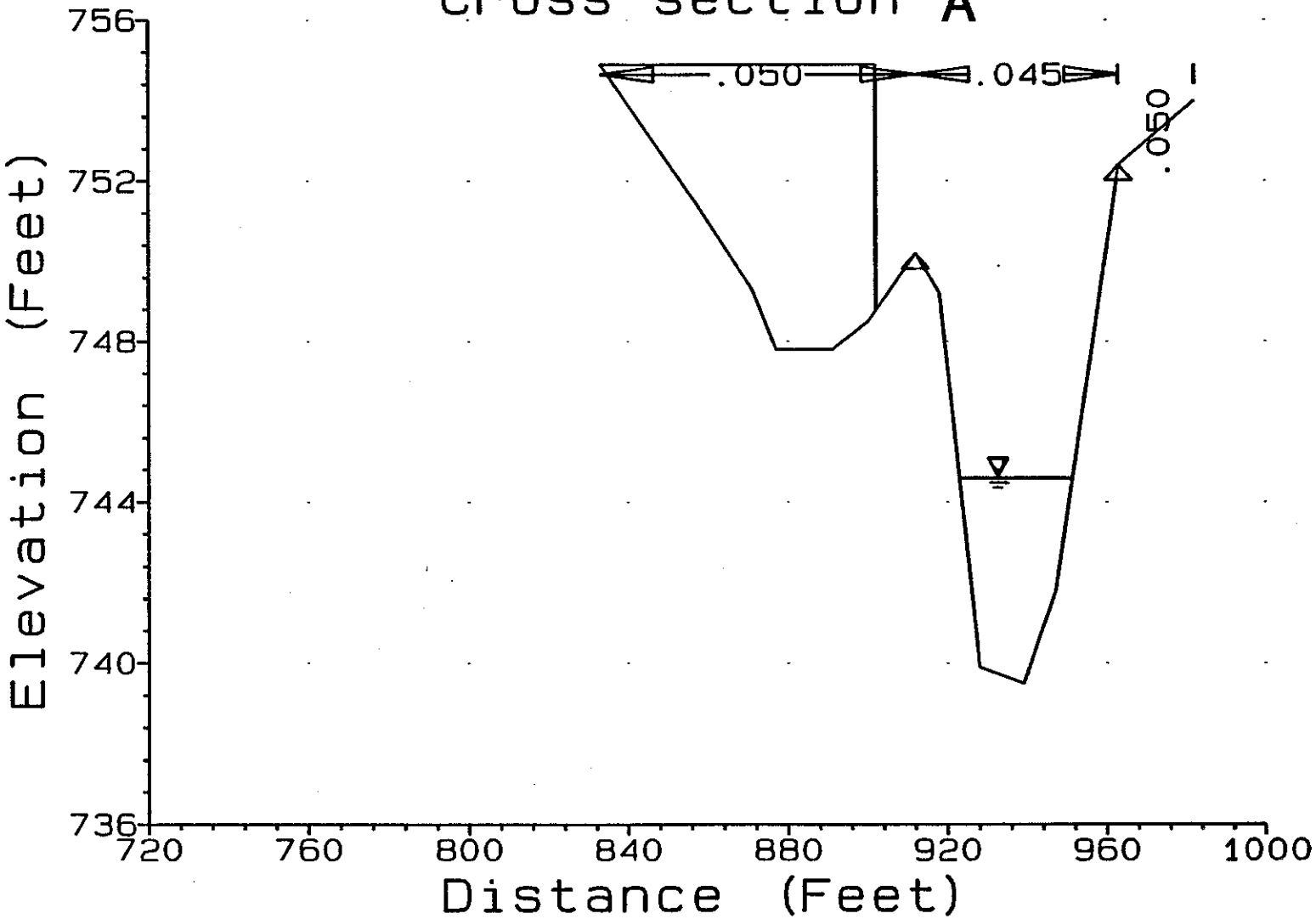
ELEVATION REFERENCE MARKS

I.D. Number	Elevation (ft.)	Description/Location
ERM 1	743.04	Chiseled 2-inch square in southeast corner of concrete pump pad, 1,100 feet west and 1,750 feet north of southeast corner Section 31, T5S R4W.
ERM 2	745.57	Arizona Highway Department brass cap, northeast sidewalk, Gila Bend Canal Bridge, Jct. Old US 80-SR 85.
ERM 3	738.82	Maricopa County Highway Department brass cap in north end headwall, 0.5 miles north Jct. Old US 80-SR 85.
ERM 4	736.82	Chiseled 2-inch square in northeast corner of concrete pump pad, 1.1 miles north Jct. Old US 80-SR 85.
ERM 5	736.76	United States Coast and Geodetic Survey brass cap stamped A-361, in a 6-inch steel pipe, 1.25 miles north Jct. Old US 80-SR 85, 50 feet west centerline Old US 80, 1 foot south of witness post.
ERM 6	741.60	Chiseled 2-inch square top, east headwall concrete irrigation box, 1.75 miles north Jct. Old US 80-SR 85, 0.3 east miles on Watermelon Road to station on left.
ERM 7	742.47	Chiseled 2-inch square in southeast corner of concrete pump pad, 2.05 miles north Jct. Old US 80-SR 85, direct road 0.2 miles east to well and station.
ERM 8	746.90	Chiseled 2-inch square in northwest corner of concrete pump pad, 2.05 miles north Jct. Old US 80-SR 85, dirt road east 0.2 miles, north 0.4 miles along canal to station on left.
ERM 9	741.70	Maricopa County Highway Department brass cap on 3-inch pipe stamped 1/4 $\frac{16}{21}$, 2.9 miles north Jct. Old US 80-SR 85, dirt road 0.15 miles east to station on right.

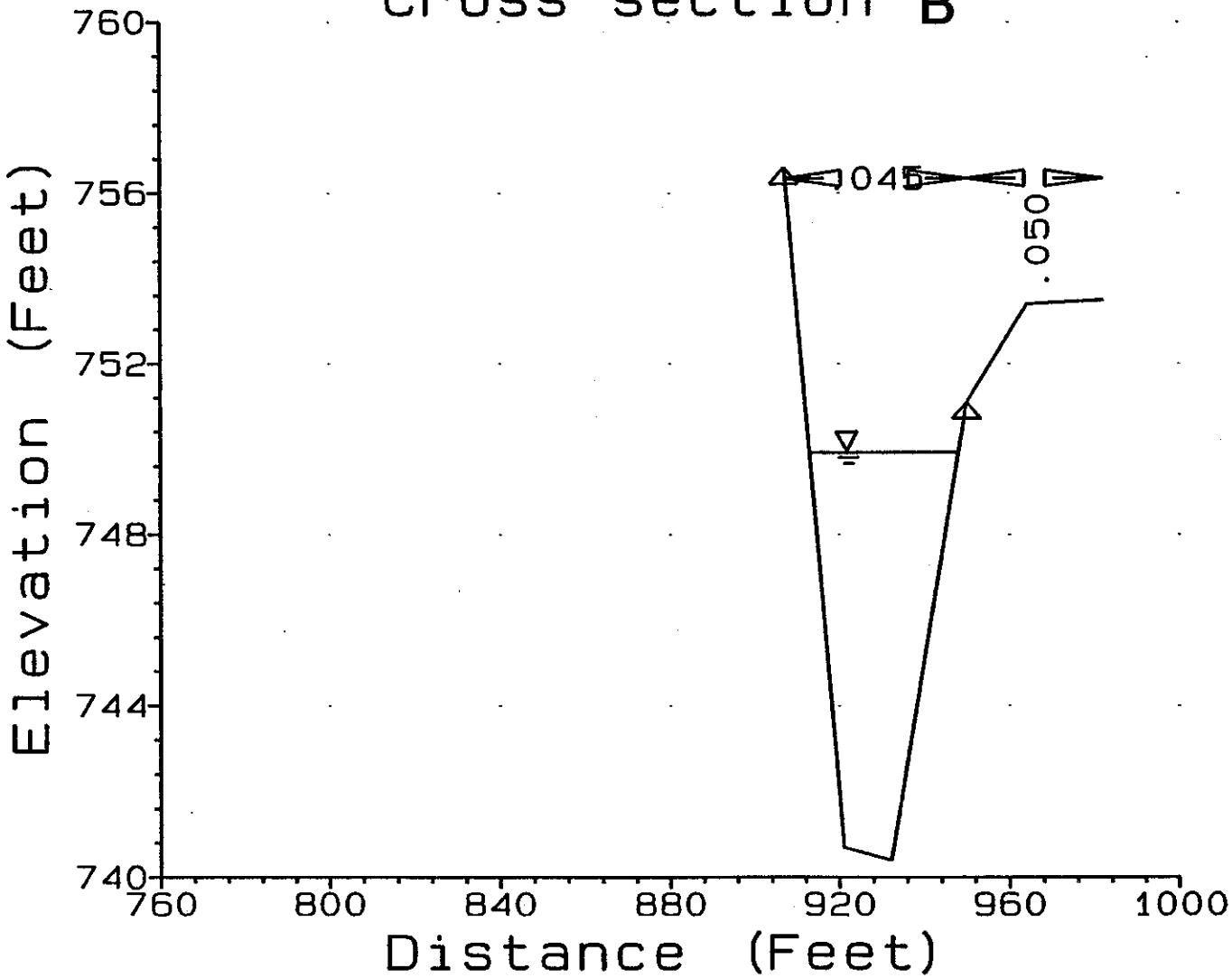
APPENDIX E

ELEVATION REFERENCE MARKS

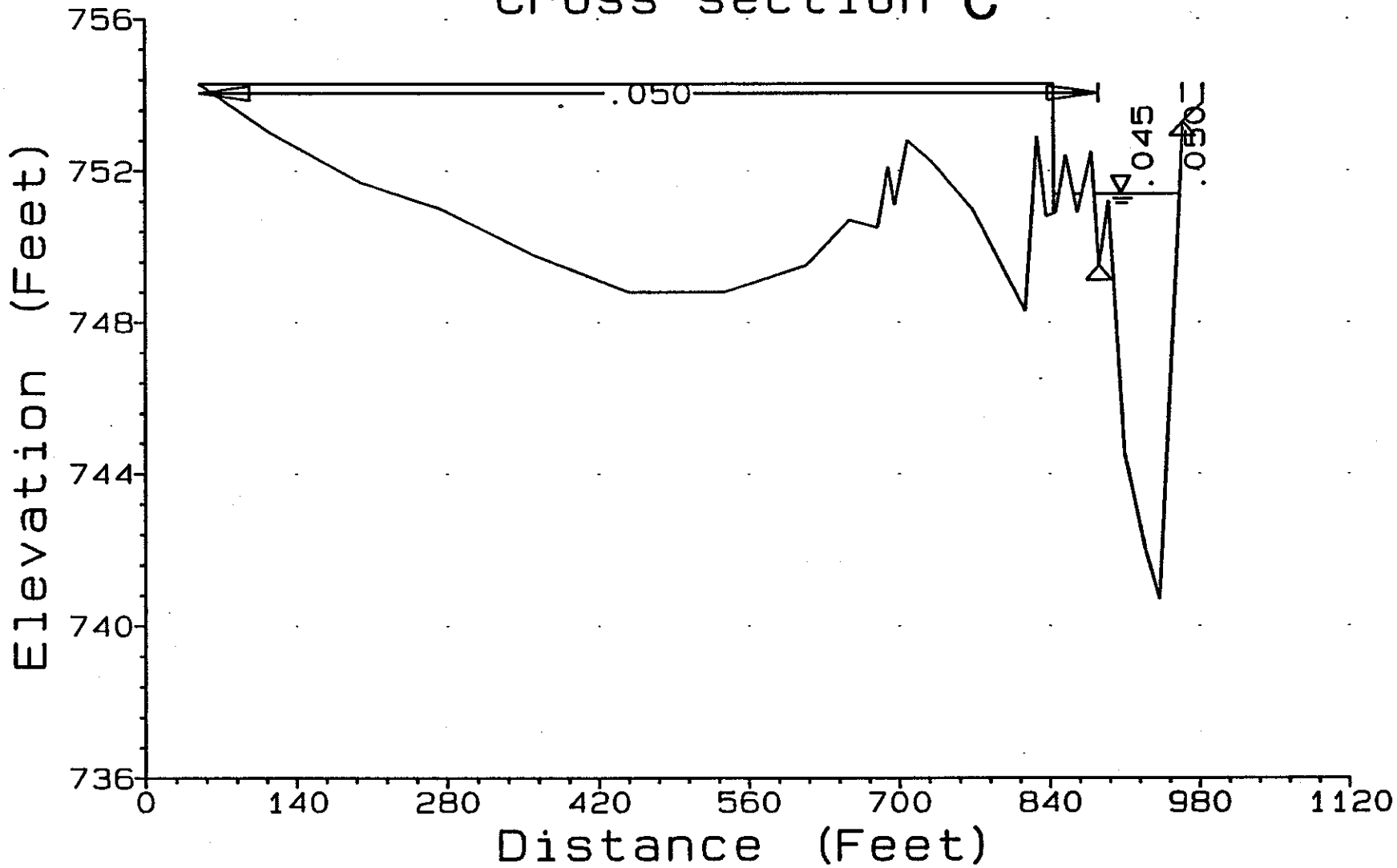
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section A



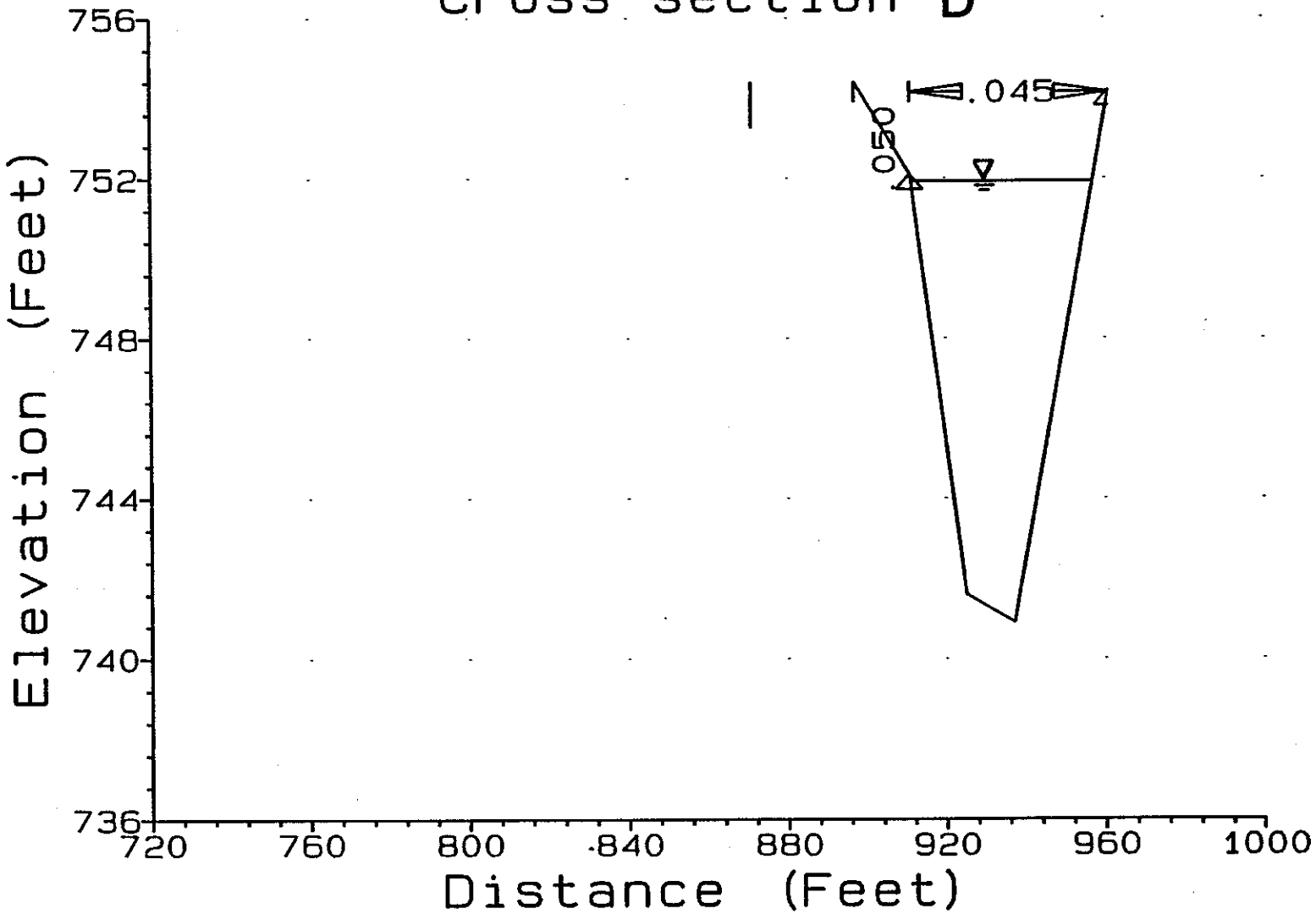
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section B



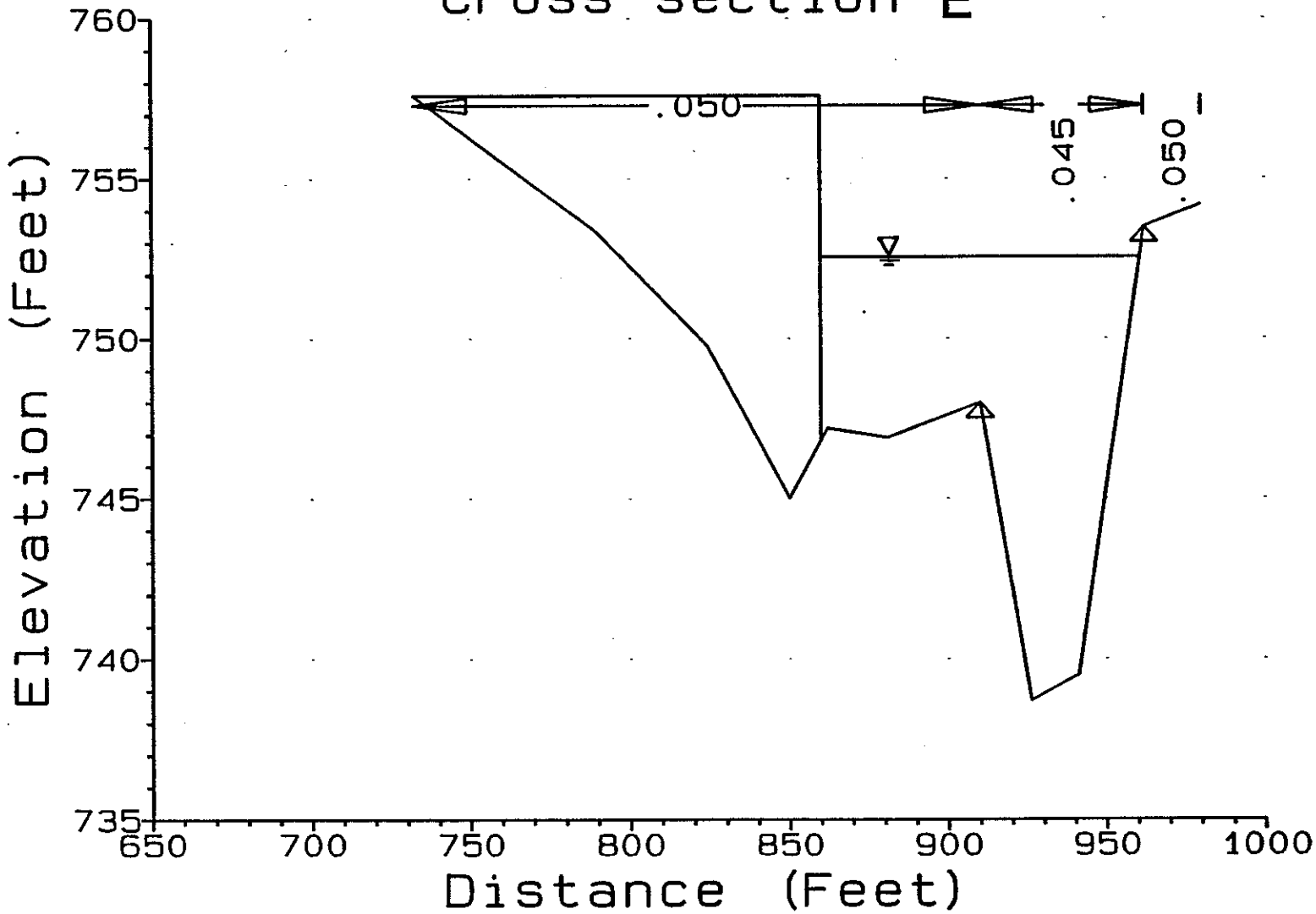
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section C



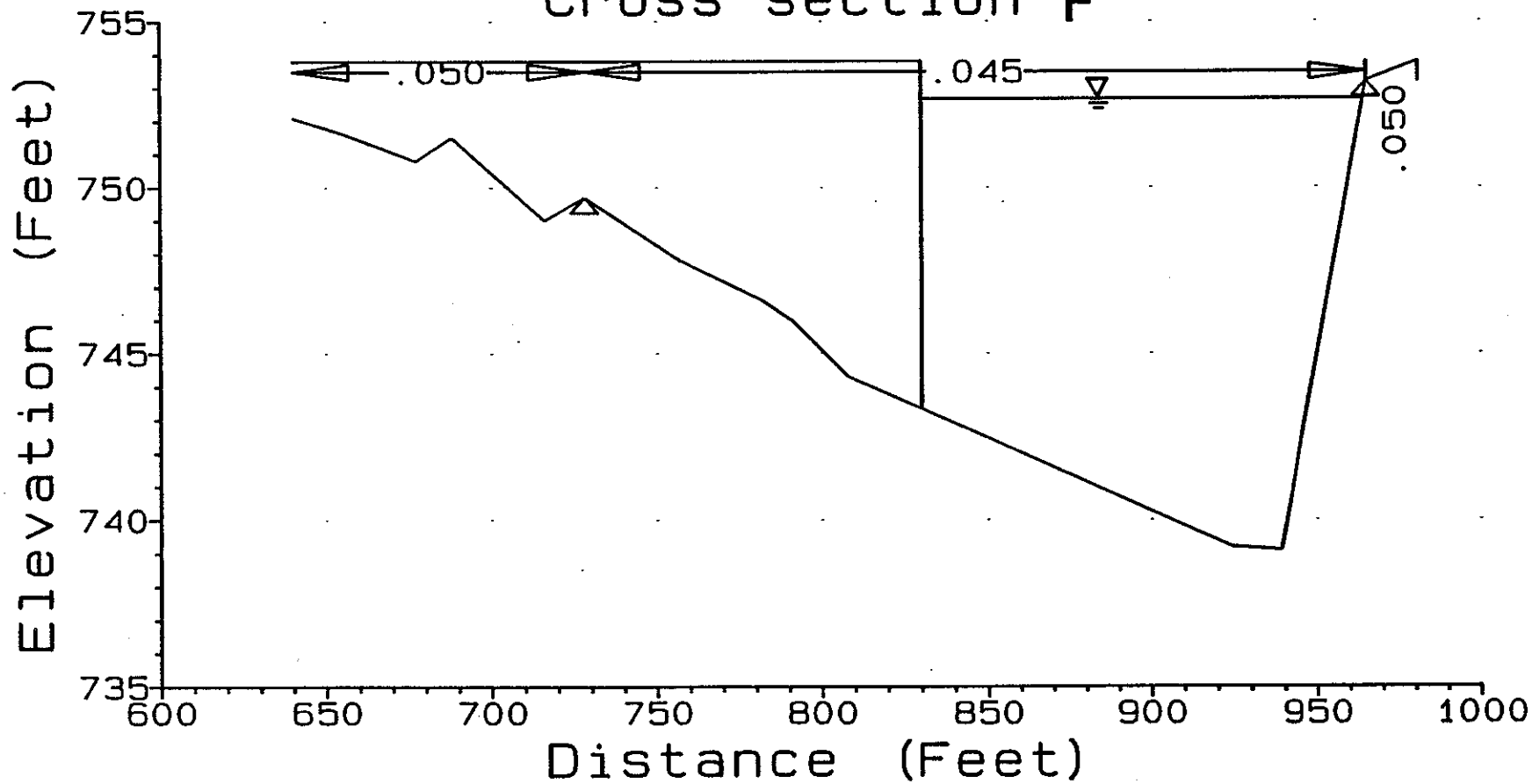
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section D



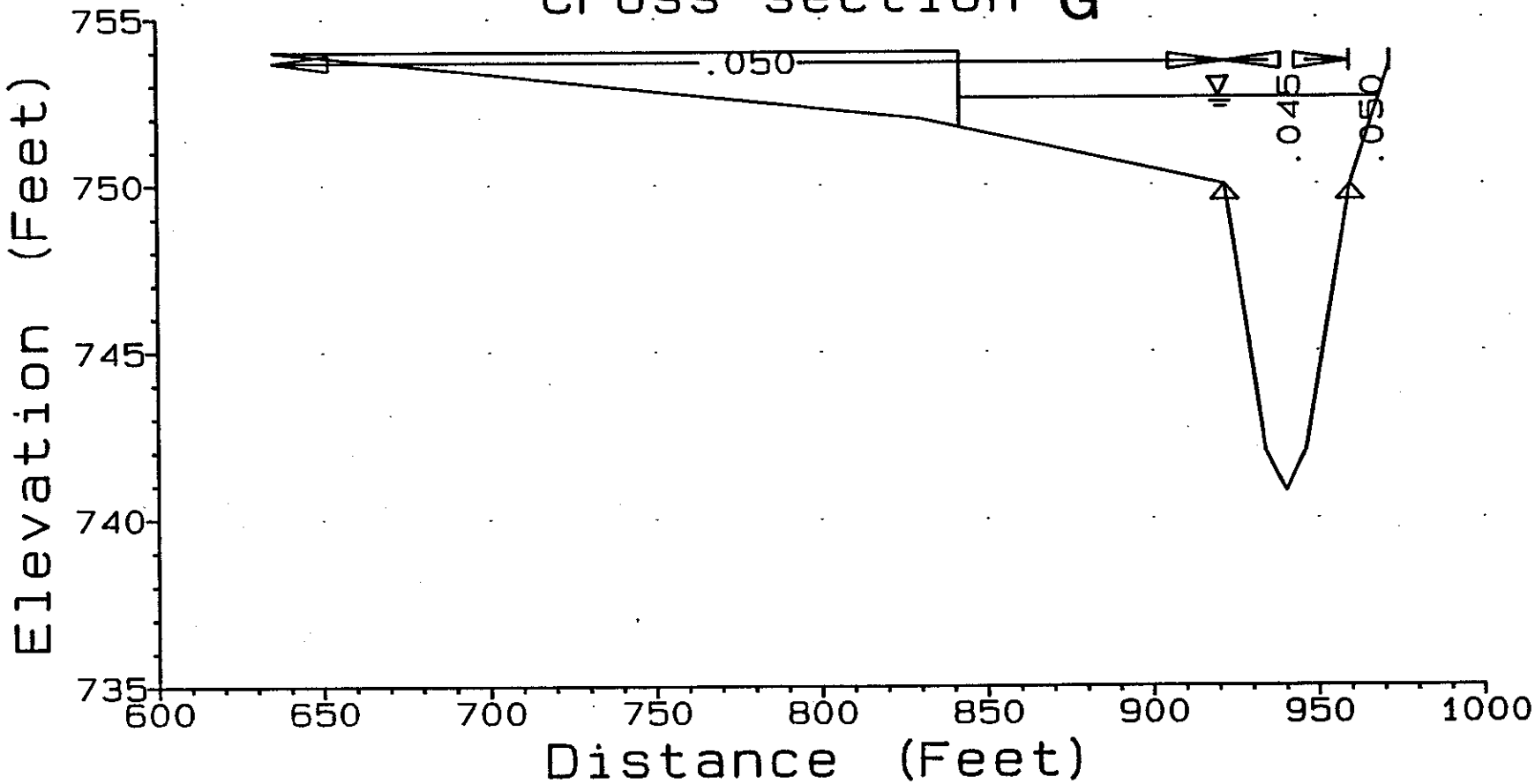
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section E



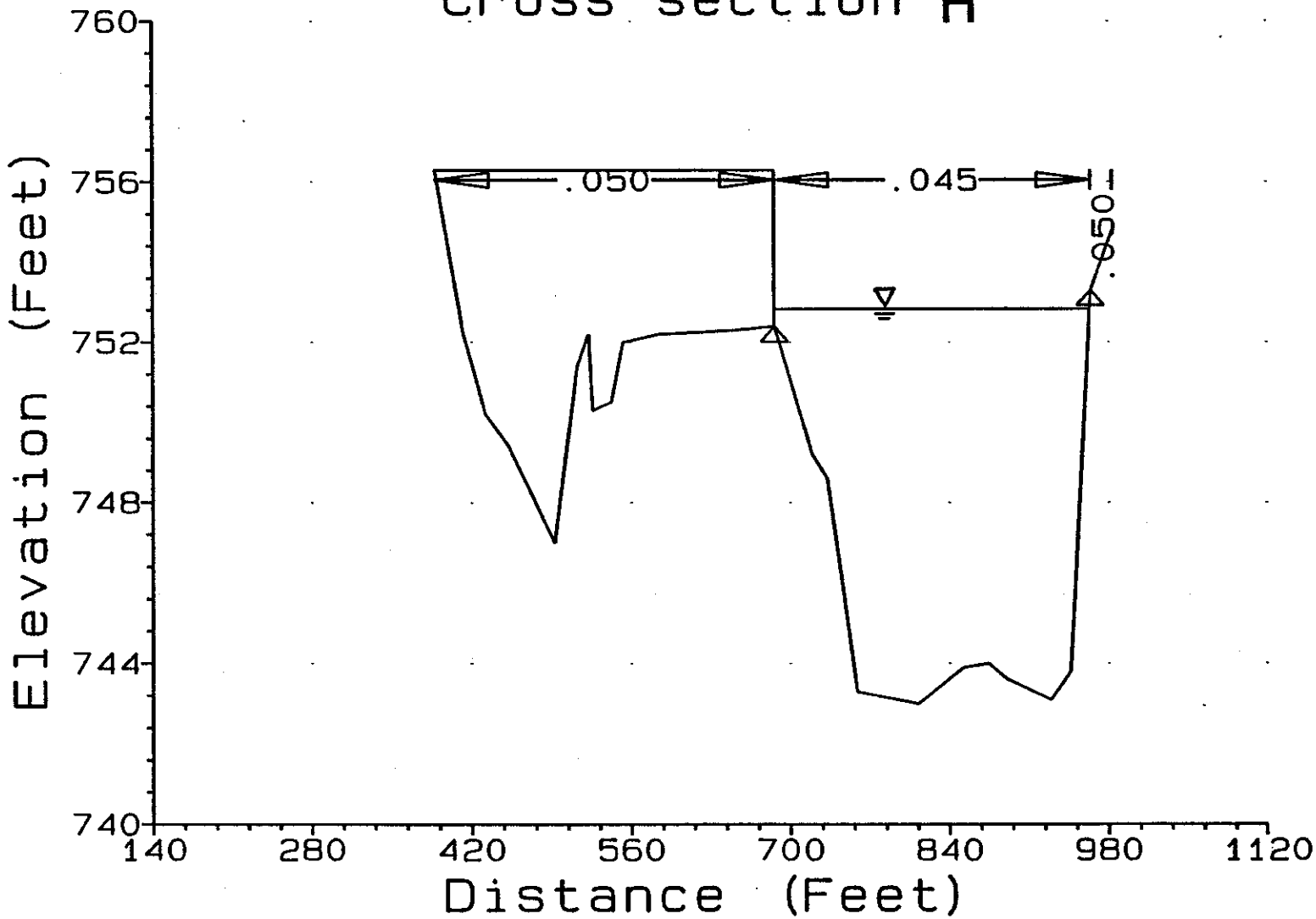
HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section F

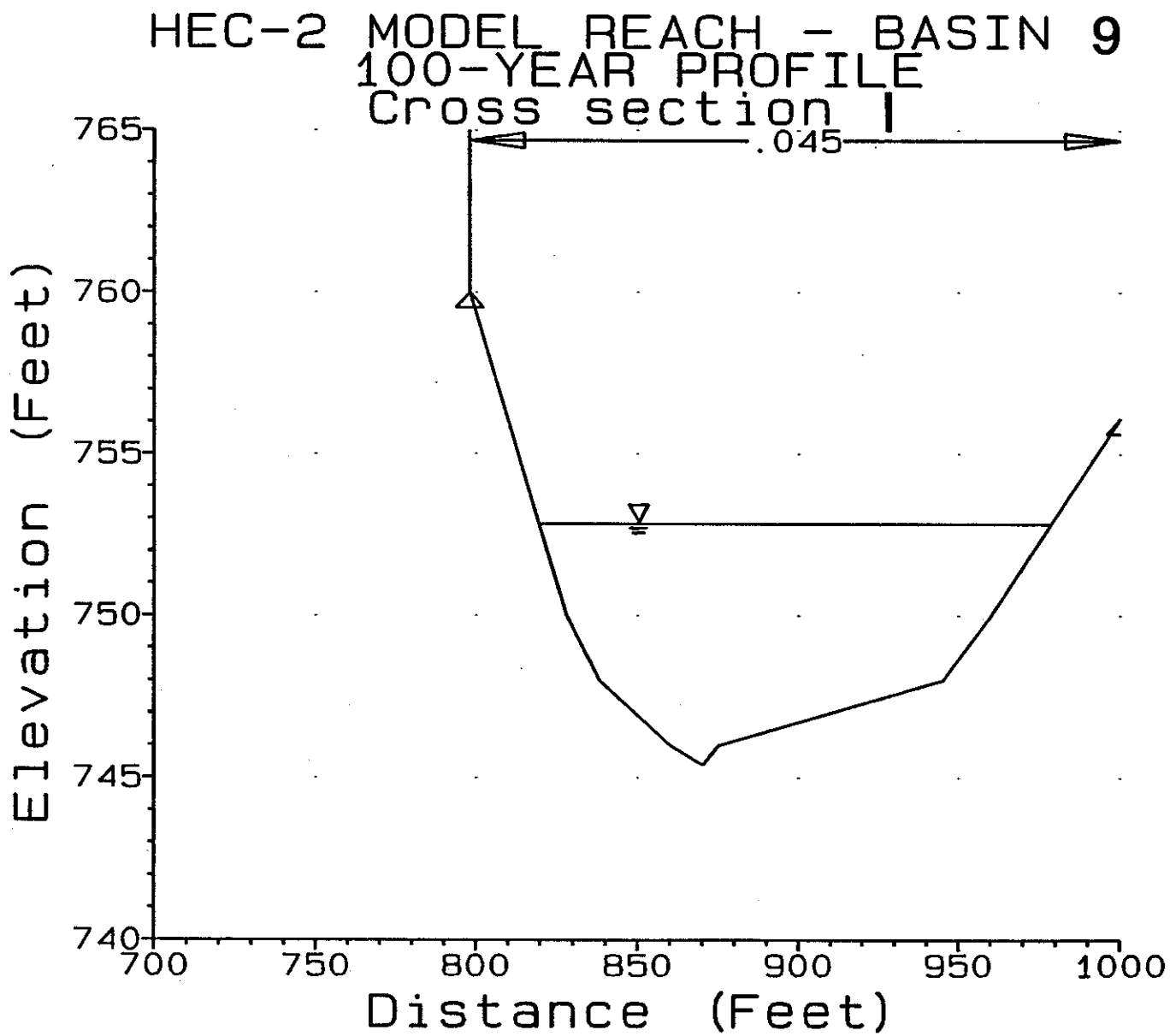


HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section G



HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section H




HEC-2 MODEL REACH - BASIN 9
100-YEAR PROFILE
Cross section I
.045
765
760
755
750
745
740
Elevation (Feet)
700
750
800
850
900
950
1000
Distance (Feet)

APPENDIX D

HEC-2 MODEL INPUT AND OUTPUT WITH SUPPORTING DOCUMENTATION

- HEC-2 Input
- HEC-2 Output
- Manning 'n' Computation
- Effective Flow Area Determination
- Cross Section Plots

```
C
C     10
C 153.83CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
C 153.83BY DONOHUE AND ASSOCIATES, INC., PHOENIX, ARIZONA
C 153.83FOR GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
C 153.83DONOUE PROJECT NUMBER 18099
C 153.83RUN DESCRIPTION: HEC-2 ANALYSIS OF DEEP CHANNEL IN BASIN 9
C 153.83                 EFFECTIVE FLOW AREA DELINEATED USING X3 CARDS.
C 153.83                 STARTING WSEL = 744.6
C 153.83                 CHANNEL FLOW INTERPOLATED FROM RESULTS OF
C 153.83                 DONOHUE HEC-1 MODEL: SKILKS.HC1
C 153.83FILE NAME: MODELA.HC2   DATE:  11/12/91
T1      GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
T2      MODEL A - CHANNEL ALONG CANAL BERM IN BASIN 9
T3       100-YR PROFILE
J1     0       2       0       0       0       0       0       0   744.6       0
J2     1       0       0       0       0       0       0       0       0       0
J3   150
NC 0.045    0.04   0.045     0.2     0.4
QT     1    1005
X1153.83      13     912     963       0       0       0
X3    10                    902
GR 754.9     833   751.3     858   749.3     871   747.8     877   747.8     891
GR 748.5     900   750.2     912   749.2     918   739.9     928   739.5     939
GR 741.8     947   752.4     963     754     982
QT     1    1040
X1153.99       6     907     950     800     800     800
X3    10                    907
GR 756.6     907   740.7     921   740.4     932   751.1     950   753.4     964
   753.5     982
       1    1092
X1154.22      29     886     965    1200    1200    1200
X3    10                    844
GR 754.3      49     753     116   751.7     200     751     274   749.8     358
GR 748.8     448   748.8     537   749.5     613   750.7     654   750.5     680
GR 752.1     690   751.1     696   752.8     708   752.2     732     751     768
GR 748.3     817   752.9     828   750.8     837   750.9     846   752.4     855
GR 750.9     866   752.5     879   749.5     886   751.2     895   744.5     910
GR 741.9     930   740.7     942   753.3     965   753.8     984
QT     1    1127
X1154.37       5     911     961     800     800     800
X3    10                    871
GR 754.4     897   752.1     911   741.6     925   740.9     937   754.2     961
QT     1    1179
X1154.60      11     910     962    1200    1200    1200
X3    10                    860
GR 757.6     732   753.4     789   749.8     824     745     850   747.2     862
GR 746.9     881     748     910   738.7     926   739.5     941   753.5     962
GR 754.2     980
QT     1    1231
X1154.83      14     728     965    1200    1200    1200
X3    10                    830
GR 752.1     640   751.6     656   750.8     677   751.5     688     749     716
GR 749.7     728   747.8     757   746.6     782     746     791   744.3     808
GR 739.2     924   739.1     939   753.2     965   753.8     981
       1    1252
   54.92       9     922     960     475     475     475
X3    10                    842
GR   754     635   753.6     675     752     830     750     922     742     934
GR 740.8     940     742     946     750     960   753.6     972
```

```
QT      1    1266
X1154.98      24     686     964     325     325     325
X3     10                    686
GR   756.3    388   752.2     413   750.2     432   749.5     450     747     492
GR   751.4    512   752.2     522   750.3     526   750.5     542     752     553
GR   752.2    584   752.3     650   752.4     686   749.2     719   748.6     732
GR   743.3    758     743     812   743.9     852     744     874   743.6     891
GR   743.1    929   743.8     946   753.3     964   754.8     983
QT      1    1290
X1155.09       9     798    1000     605     605     605
X3     10                    798
GR    760    798     750     828     748     838     746     860   745.4     870
GR    746    875     748     945     750     960   756.1    1000
EJ


ER
```

HEC2 S/N: 1126260085 HMVersion: 6.20 Data File: MODELA.HC2

```
*****************************************
* HEC-2 WATER SURFACE PROFILES          *
*                                       *
* Version   4.6.0;  February 1991       *
*                                       *
* RUN DATE    21NOV91    TIME   17:42:37 *
*****************************************
```

```
****************************************
* U.S. ARMY CORPS OF ENGINEERS         *
* HYDROLOGIC ENGINEERING CENTER        *
* 609 SECOND STREET, SUITE D           *
* DAVIS, CALIFORNIA 95616-4687         *
*         (916) 756-1104               *
****************************************
```

```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X         XXXXX    XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

```
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
:::                                     :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION  :::
:::                                     :::
:::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::
```

```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 21NOV91 17:42:38

```
************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.0;  February 1991
************************************


T1      GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
T2      MODEL A - CHANNEL ALONG CANAL BERM IN BASIN 9
T3       100-YR PROFILE

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2        0        0        0        0        0        0      744.6      0

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

      1        0        0        0        0        0        0        0        0        0


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150

NC    0.045      0.04      0.045       0.2        0.4
QT        1      1005
        CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
        BY DONOHUE AND ASSOCIATES, INC., PHOENIX, ARIZONA
        FOR GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
        DONOUE PROJECT NUMBER 18099
        RUN DESCRIPTION: HEC-2 ANALYSIS OF DEEP CHANNEL IN BASIN 9
                         EFFECTIVE FLOW AREA DELINEATED USING X3 CARDS.
                         STARTING WSEL = 744.6
                         CHANNEL FLOW INTERPOLATED FROM RESULTS OF
                         DONOHUE HEC-1 MODEL: SKILKS.HC1
        FILE NAME: MODELA.HC2   DATE:  11/12/91
X1    153.83        13       912       963         0         0         0
X3        10                           902
GR     754.9       833     751.3       858     749.3       871     747.8       877     747.8       891
GR     748.5       900     750.2       912     749.2       918     739.9       928     739.5       939
GR     741.8       947     752.4       963       754       982

QT        1      1040
X1    153.99         6       907       950       800       800       800
X3        10                           907
GR     756.6       907     740.7       921     740.4       932     751.1       950     753.4       964
GR     753.5       982

          1      1092
      154.22        29       886       965      1200      1200      1200
X3        10                           844
GR     754.3        49       753       116     751.7       200       751       274     749.8       358
GR     748.8       448     748.8       537     749.5       613     750.7       654     750.5       680
```

GR	752.1	690	751.1	696	752.8	708	752.2	732	751	768

	748.3	817	752.9	828	750.8	837	750.9	846	752.4	855
GR	750.9	866	752.5	879	749.5	886	751.2	895	744.5	910
GR	741.9	930	740.7	942	753.3	965	753.8	984		
QT	1	1127								
X1	154.37	5	911	961	800	800	800			
X3	10			871						
GR	754.4	897	752.1	911	741.6	925	740.9	937	754.2	961
QT	1	1179								
X1	154.60	11	910	962	1200	1200	1200			
X3	10			860						
GR	757.6	732	753.4	789	749.8	824	745	850	747.2	862
GR	746.9	881	748	910	738.7	926	739.5	941	753.5	962
GR	754.2	980								
QT	1	1231								
X1	154.83	14	728	965	1200	1200	1200			
X3	10			830						
GR	752.1	640	751.6	656	750.8	677	751.5	688	749	716
GR	749.7	728	747.8	757	746.6	782	746	791	744.3	808
GR	739.2	924	739.1	939	753.2	965	753.8	981		
QT	1	1252								
X1	154.92	9	922	960	475	475	475			
	10			842						
	754	635	753.6	675	752	830	750	922	742	934
GR	740.8	940	742	946	750	960	753.6	972		
QT	1	1266								
X1	154.98	24	686	964	325	325	325			
X3	10			686						
GR	756.3	388	752.2	413	750.2	432	749.5	450	747	492
GR	751.4	512	752.2	522	750.3	526	750.5	542	752	553
GR	752.2	584	752.3	650	752.4	686	749.2	719	748.6	732
GR	743.3	758	743	812	743.9	852	744	874	743.6	891
GR	743.1	929	743.8	946	753.3	964	754.8	983		
QT	1	1290								
X1	155.09	9	798	1000	605	605	605			
X3	10			798						
GR	760	798	750	828	748	838	746	860	745.4	870
GR	746	875	748	945	750	960	756.1	1000		

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .200 CEHV= .400
*SECNO 153.830

3470 ENCROACHMENT STATIONS= 902.0 982.0 TYPE= 1 TARGET= -902.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 750.20 ELREA= 752.40

CLIENT: FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
BY DONOHUE AND ASSOCIATES, INC., PHOENIX, ARIZONA
FOR GILA BEND CANAL FLOODPLAIN DELINEATION STUDY
DONOUE PROJECT NUMBER 18099
RUN DESCRIPTION: HEC-2 ANALYSIS OF DEEP CHANNEL IN BASIN 9
EFFECTIVE FLOW AREA DELINEATED USING X3 CARDS.
STARTING WSEL = 744.6
CHANNEL FLOW INTERPOLATED FROM RESULTS OF
DONOHUE HEC-1 MODEL: SKILKS.HC1
FILE NAME: MODELA.HC2 DATE: 11/12/91

153.830	5.10	744.60	.00	744.60	746.07	1.47	.00	.00	750.20
1005.0	.0	1005.0	.0	.0	103.3	.0	.0	.0	752.40
.00	.00	9.73	.00	.000	.045	.000	.000	739.50	922.95
.017670	0.	0.	0.	0	0	0	.00	28.28	951.23

*SECNO 153.990

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.83

3470 ENCROACHMENT STATIONS= 907.0 982.0 TYPE= 1 TARGET= -907.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 806.60 ELREA= 751.10

153.990	9.52	749.92	.00	.00	750.28	.36	3.99	.22	806.60
1040.0	.0	1040.0	.0	.0	216.8	.0	2.9	.6	751.10
.05	.00	4.80	.00	.000	.045	.000	.000	740.40	912.88
.002361	800.	800.	800.	5	0	0	.00	35.14	948.02

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 154.220

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.22

3470 ENCROACHMENT STATIONS= 844.0 984.0 TYPE= 1 TARGET= -844.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 749.50 ELREA= 753.30

154.220	10.69	751.39	.00	.00	751.48	.09	1.15	.05	749.50
1092.0	4.1	1087.9	.0	7.8	451.8	.0	12.3	2.3	753.30
.19	.52	2.41	.00	.045	.045	.000	.000	740.70	844.00
.000529	1200.	1200.	1200.	4	0	0	.00	92.48	961.52

*SECNO 154.370

3470 ENCROACHMENT STATIONS= 871.0 961.0 TYPE= 1 TARGET= -871.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 752.10 ELREA= 100000.00

154.370	11.03	751.93	.00	.00	752.13	.21	.60	.05	752.10
1127.0	.0	1127.0	.0	.0	308.9	.0	19.3	3.6	100000.00
.25	.00	3.65	.00	.000	.045	.000	.000	740.90	911.23
.001133	800.	800.	800.	2	0	0	.00	45.67	956.90

*SECNO 154.600

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.70

3470 ENCROACHMENT STATIONS= 860.0 980.0 TYPE= 1 TARGET= -860.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 748.00 ELREA= 753.50

154.600	13.84	752.54	.00	.00	752.58	.04	.42	.03	748.00
1179.0	334.1	844.9	.0	262.9	476.1	.0	33.7	5.6	753.50
.45	1.27	1.77	.00	.045	.045	.000	.000	738.70	860.00
.000171	1200.	1200.	1200.	2	0	0	.00	100.56	960.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 154.830

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.42

3470 ENCROACHMENT STATIONS= 830.0 981.0 TYPE= 1 TARGET= -830.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 100000.00 ELREA= 753.20

154.830	13.55	752.65	.00	.00	752.66	.01	.07	.01	100000.00
1231.0	.0	1231.0	.0	.0	1441.8	.0	63.8	8.9	753.20
.84	.00	.85	.00	.000	.045	.000	.000	739.10	830.00
.000032	1200.	1200.	1200.	2	0	0	.00	133.99	963.99

*SECNO 154.920

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .20

70 ENCROACHMENT STATIONS= 842.0 972.0 TYPE= 1 TARGET= -842.000

154.920	11.80	752.60	.00	.00	752.76	.16	.04	.06	750.00
1252.0	184.3	1054.0	13.7	138.7	306.1	11.3	74.1	10.3	750.00
.88	1.33	3.44	1.21	.045	.045	.040	.000	740.80	842.00
.000788	475.	475.	475.	2	0	0	.00	126.68	968.68

*SECNO 154.980

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.12

3470 ENCROACHMENT STATIONS= 686.0 983.0 TYPE= 1 TARGET= -686.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 752.40 ELREA= 753.30

154.980	9.81	752.81	.00	.00	752.81	.01	.02	.03	752.40
1266.0	.0	1266.0	.0	.0	2134.7	.0	83.8	11.8	753.30
1.04	.00	.59	.00	.000	.045	.000	.000	743.00	686.00
.000022	325.	325.	325.	2	0	0	.00	277.07	963.07

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 155.090

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .27

3470 ENCROACHMENT STATIONS= 798.0 1000.0 TYPE= 1 TARGET= -798.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 810.00 ELREA= 100000.00

155.090	7.42	752.82	.00	.00	752.86	.04	.03	.01	810.00
1290.0	.0	1290.0	.0	.0	775.6	.0	104.0	14.8	100000.00
1.14	.00	1.66	.00	.000	.045	.000	.000	745.40	819.54
.000310	605.	605.	605.	2	0	0	.00	158.94	978.49

PROFILE FOR STREAM 100-YR PROFILE

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

```
ELEVATION   739.     741.     743.     745.     747.     749.     751.     753.     755.     757.
   SECNO    CUMDIS

 153.83      0.  C  I    .        .       W.     E .        .      L .       R.    M  .        .        .
             100.  C   I    .        .        . W    E.        .        .      R .    M  .        . L      .
             200.  C   I    .        .        .   W  . E      .        .     R  .    M  .        .        L
             300.  C    I   .        .        .      W.   E   .        .    R   .    M  .        .        L
             400.  C    I   .        .        .        . W  E .        .   R    .   M   .        .        L
             500.  C     I  .        .        .        .   W  E        . R     .   M   .        .        L
             600.  C     I  .        .        .        .      W. E     . R     .   M   .        .        L
             700.  C      I .        .        .        .        . W E  . R      M   .        .        L
 153.99      800.  C       I.        .        .        .        .   W E . R      M   .        .        L
             900.  C       I.        .        .        .        .    WE . R      M   .        .        L
            1000.  C       I.        .        .        .        .    W E. R      M   .        .        L
            1100.  C       I.        .        .        .        .     WE.   R    M   .        .        L
            1200.  C       I.        .        .        .        .      WE    R   M   .        .        L
            1300.  C       I.        .        .        .        .      WE     R  M   .        .        L
            1400.  C       I.        .        .        .        .       WE    R  M   .        .        L
            1500.  C       I.        .        .        .        .       WE     R M   .        .        L
            1600.  C        I        .        .        .        .       .WE     R.   M   .        .        L
            1700.  C        I        .        .        .        .       . E      R   M   .        .        L
            1800.  C        I        .        .        .        .       . WE     .R  M   .        .        L
            1900.  C        I        .        .        .        .       . E      . R M L .        .        .
 154.22     2000.  C        I        .        .        .        .  L    . WE     . R M   .        .        .
            2100.  C        I        .        .        .        .    L  .  E     .    M   .        .        R
            2200.  C        I        .        .        .        .    L  .  WE    .    M   .        .        R
            2300.  C        I        .        .        .        .      L.  WE    .    M   .        .        R
            2400.  C        .I       .        .        .        .       L   WE   .    M   .        .        R
            2500.  C        .I       .        .        .        .       . L WE   .     M  .        .        R
            2600.  C        .I       .        .        .        .       .  LWE   .     M  .        .        R
            2700.  C        .I       .        .        .        .       .   LWE  .     M  .        .        R
 154.37     2800.  C        .I       .        .        .        .       .    WE  .      M .        .        R
            2900.  C        I        .        .        .        .       .   LWE  .      M .        .        R
            3000.  C       I.        .        .        .        .       .  L WE  .      M .        .        R
            3100.  C      I .        .        .        .        .       . L   WE .      M .        .        R
            3200.  C     I  .        .        .        .        .       L     WE .      M .        .        R
            3300.  C    I   .        .        .        .        .      L .    WE .      M .        .        R
            3400.  C    I   .        .        .        .        .    L  .     E .      M .        .        R
            3500.  C   I    .        .        .        .        .   L   .     E .      M .        .        R
            3600.  C  I     .        .        .        .        . L     .     WE.      M .        .        R
            3700.  C I      .        .        .        .        .L      .     WE.      M .        .        R
            3800.  C I      .        .        .        .        L       .      E.      M .        .        R
            3900.  CI       .        .        .        .      L .       .      E.      M .        .        R
 154.60     4000.  I        .        .        .        .    L   .       .      E.   R  M .        .        .
            4100.  I        .        .        .        .        .       .      E.   R  M .        .        L
            4200.  I        .        .        .        .        .       .      E.   R  M .        .        L
            4300.  I        .        .        .        .        .       .      E.   R  M .        .        L
            4400.  CI       .        .        .        .        .       .      WE R  M .        .        L
            4500.  CI       .        .        .        .        .       .      WE R  M .        .        L
            4600.  CI       .        .        .        .        .       .      WE R  M .        .        L
            4700.  CI       .        .        .        .        .       .       E R  M .        .        L
```

```
        4800.  CI        .        .        .        .        .        .        E  R  M  .        .        L
        4900.  CI        .        .        .        .        .        .        E  R  M  .        .        L
        5000.  C I       .        .        .        .        .        .        E  R  M  .        .        L
        5100.  C I       .        .        .        .        .        .        E  R  M  .        .        L
154.83  5200.  C I       .        .        .        .        .        .        E  R M   .        .        L
        5300.  C   I     .        .        .        .        .        .       RE   M   .        .        L
        5400.  C     I   .        .        .        .        .        .     R  E   M   .        .        L
        5500.  C      I  .        .        .        .        .        . R      E   M   .        .        L
        5600.  C       I.        .        .        .        .       R.        E   M   .        .        L
154.92  5700.  C        I        .        .        .        .     L  .       WE  M    .        .        .
        5800.  C        .  I     .        .        .        .        L R      E    M  .        .        .
        5900.  C        .     I  .        .        .        .        .  L  R  E      M .        .        .
154.98  6000.  C        .        .I       .        .        .        .       L.E R     M        .        .
        6100.  C        .        . I      .        .        .        .        .E       . M      .        L
        6200.  C        .        .   I    .        .        .        .        .E       .  M     .        L
        6300.  C        .        .     I  .        .        .        .        .E       .   M    .        L
        6400.  C        .        .       I.        .        .        .        .E       .    M   .        L
        6500.  C        .        .        .I       .        .        .        .E       .     M  .        L
        6600.  C        .        .        . I      .        .        .        .E       .      M .        L
155.09  6700.  C        .        .        .  I     .        .        .        .E       .      M .        L
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THIS RUN EXECUTED 21NOV91 17:42:39

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HEC-2 WATER SURFACE PROFILES

Version 4.6.0; February 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100-YR PROFILE

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	153.830	.00	.00	.00	739.50	1005.00	744.60	.00	746.07	176.70	9.73	103.29	75.61
*	153.990	800.00	.00	.00	740.40	1040.00	749.92	.00	750.28	23.61	4.80	216.76	214.03
*	154.220	1200.00	.00	.00	740.70	1092.00	751.39	.00	751.48	5.29	2.41	459.53	474.59
	154.370	800.00	.00	.00	740.90	1127.00	751.93	.00	752.13	11.33	3.65	308.94	334.75
*	154.600	1200.00	.00	.00	738.70	1179.00	752.54	.00	752.58	1.71	1.77	739.01	902.91
*	154.830	1200.00	.00	.00	739.10	1231.00	752.65	.00	752.66	.32	.85	1441.82	2183.45
*	154.920	475.00	.00	.00	740.80	1252.00	752.60	.00	752.76	7.88	3.44	456.17	445.92
*	154.980	325.00	.00	.00	743.00	1266.00	752.81	.00	752.81	.22	.59	2134.74	2727.99
*	155.090	605.00	.00	.00	745.40	1290.00	752.82	.00	752.86	3.10	1.66	775.59	733.25

100-YR PROFILE

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	153.830	1005.00	744.60	.00	.00	.00	28.28	.00
*	153.990	1040.00	749.92	.00	5.32	.00	35.14	800.00
*	154.220	1092.00	751.39	.00	1.47	.00	92.48	1200.00
	154.370	1127.00	751.93	.00	.53	.00	45.67	800.00
*	154.600	1179.00	752.54	.00	.61	.00	100.56	1200.00
*	154.830	1231.00	752.65	.00	.11	.00	133.99	1200.00
*	154.920	1252.00	752.60	.00	-.05	.00	126.68	475.00
*	154.980	1266.00	752.81	.00	.21	.00	277.07	325.00
*	155.090	1290.00	752.82	.00	.01	.00	158.94	605.00

Donohue
CONSULTING ENGINEERS
PHOENIX, ARIZONA

CLIENT FCDMC DATE Revised 11-22-91
PROJECT Gila Bend BY EDL
PROJECT NO. 18099 PAGE NO. 1/1

Manning n - Computations

Compute n-value for Channel in Basin 9 according to Cowan's method described in Chow P. 108-108
Refer to Table 5-5, p. 108

Base value	$n_0 = 0.020$	(Earth Channel)
irregularity	$n_1 = 0.005$	(minor)
Section Variation	$n_2 = 0.010$	(frequent but not max)
Obstructions	$n_3 = 0.000$	(none)
Vegetation	$n_4 = 0.010$	(Low to Medium)
Meandering	$m_5 = 1.000$	(None)

$$n_c = m_5(n_0 + n_1 + n_2 + n_3 + n_4) = \boxed{0.045}$$

For Overbank areas $n_4 = 0.015$ due to slightly greater vegetation present

DONOHUE & ASSOCIATES, INC.

CONSULTING ENGINEERS

CLIENT FCDMC DATE 10/27/91

PROJECT Gila Bend BY AA CHKD

PROJECT NO. PAGE NO. 1

EFFECTIVE FLOW AREA DELINEATION FOR HEC-2 MODEL REPRESENTING DEEP FLOW CHANNEL IN BASIN 9

See attached figure for the Effective flow area delineation. The delineation is based on flow expansion of 4:1 (1 foot of horizontal expansion for every 4 feet of flow length), and flow contraction of 1:1.

The flow area limit at the right side of the X-Section is at the canal berm. The left limit is as follows:

X-SEC. NO.	Dist. from canal berm
67310 (1)	80
66510 (2)	70
65310 (3)	140
64510 (4)	90
63310 (5)	120
62110 (6)	150
61635 (7)	130
61310 (8)	190
60705 (9)	200