ENVIRONMENTAL HYDROLOGY LAW CONSULTANTS

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July 9, 2007

Myrna Hau Rodriguez
PR-466 Road, Bajuras Ward
Isabela, PR 00605

Reference: Hydrologic/Hydraulic Study And Jurisdictional Determination Preparation
Villas del Mar Hau Development
Isabela, Puerto Rico

Dear Mrs. Hau:

Environmental Hydrology Law Consultants (EHLC) respectfully submits one copy of the report documenting the Hydrologic/Hydraulic (H/H) evaluation and one copy of the Jurisdictional Determination (JD) activities conducted for the referenced project. The H/H study was conducted to comply with the requirements of the Puerto Rico Planning Board (PRPB) Regulations No.13 and No. 3. The JD was performed to comply with the Clean Water Acts and the Corps of Engineers regulations. Please note that the H/H will be revised once the following additional data be obtained:

- Topographic data of the portion of the site located to the south of the PR-466 road.
- Topographic data of the PR-466 road, including any crossing structures.
- Percolation test of the project site soil
- Final proposed grading

We appreciate the opportunity to assist you with this project. If you have any question regarding these reports, please do not hesitate to contact us at your convenience.

Respectfully,
ENVIRONMENTAL HYDROLOGY LAW CONSULTANTS

Guillermo E. Fulcar, P.H., J.D. **Jesus M. Suarez**

Principal Hydrologist **Project Engineer**

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HYDROLOGIC/HYDRAULIC STUDY

VILLAS DEL MAR HAU DEVELOPMENT
ISABELA, PUERTO RICO

PREPARED FOR:

MYRNA HAU RODRIGUEZ
ISABELA, PUERTO RICO

PREPARED BY:

ENVIRONMENTAL HYDROLOGY LAW CONSULTANTS
LEVITTOWN, PUERTO RICO

JULY 2007

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1.0 INTRODUCTION

1.1 Background

Mrs. Myrna Hau Rodriguez is proposing the Villas del Mar Hau development in a property located at the PR-466 road, Km. 1.8, the Bajuras Ward in Isabela. The project covers an area of approximately 44 acres. The proposed project consists of the construction of 244 residential units distributed in resort villas (11 buildings), resort apartments (3 buildings) and condominiums (2 buildings); 82 condo hotel units in 7 buildings and 96 hotel rooms and supporting facilities such as restaurants, boutique, conference room, pools, gardens, sport facilities and access roads and streets. The approximate location of the proposed development project is shown in Figure 1. The proposed development master plan is presented in Figure 2.

The PR-466 road runs across the project site from west to east. Project area located to the south of this road is about 14 acre while project area to the north is comprised of about 30 acre. Runoff generated at the portion of the site south of the PR-466 drains toward a low-laying area located at the southeastern corner of the site and eventually percolates into the subsurface and/or discharge into the northern portion through a pipe system located under the PR-466 road. Runoff generated at the portion of the site located to the north of the PR-466 road drains toward the eastern portion of the site and eventually evaporate and/or infiltrates into the subsurface.

A review of the FEMA flooding map for the area (FEMA, 2005), which is presented in Figure 3, indicates that the proposed project site is located outside of the coastal flooding area. Reported flood elevation at the adjacent coastal area is 2.3 meter above mean sea level (MSL).

1.2 Purpose and Scope

Mrs. Hau retained Environmental Hydrology Law Consultants (EHLC) to conduct a Hydrologic and Hydraulic (H/H) study for the proposed project site. The objective of the study was to determine the potential impact of the proposed development on existing hydrologic/hydraulic conditions at the site and nearby areas. This study was also aimed at designing, conceptually, flood control measures which may be implemented within the project site.

The scope of work for this project included the following activities:

- Hydrologic study of the proposed project site to estimate the 2, 5, 10, 25, 50, and 100-year storm hydrographs under existing conditions.
- A hydrologic evaluation of the project site to estimate the 2, 5, 10, 25, 50, and 100-year storm hydrographs, assuming conditions after the construction of the project.
- A hydrologic evaluation of the contributing offsite areas to estimate the 2, 5, 10, 25, 50, and 100-year storm hydrographs.
- Hydraulic evaluation of the drainage structures located under the PR-488 road to estimate their capacity to convey the 100-year flood, assuming conditions prior and after the construction of the proposed project.
- Conceptual design of runoff control measures at the proposed project site to manage potential excess runoff expected to be generated after construction of the proposed project.
- Preparation of a report documenting the analyses conducted.

1.3 Database

The data used during the course of this study were obtained from the following sources:

- Topographic survey maps of the project site prepared by Francisco Perez Agront.
- Proposed project Site Development Master Plan prepared by Sierra, Cardona & Ferre Design

Workshop.

- U.S. Geological Survey 7.5 Min. Topographic Map of Isabela, Quadrangle (USGS, 1964).
- U.S. Department of Commerce Technical Paper No. 42 (USDC, 1961).
- U.S. Soil Conservation Service Soil Survey of Mayaguez Area of Western Puerto Rico (SCS, 1975).

This study has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using the degree of skill and care ordinarily exercised by reputable consultants under similar circumstances. No other warranty, expressed or implied is made. The results of this study should be used as guidance by the project designing engineers, but plans provided are not intended for construction purposes.

2.0 HYDROLOGIC EVALUATION

2.1 Methodology

The hydrologic evaluation for this study was performed using the USACE HEC-1 computer model (Version 4.1, USACE, 1998). This event simulation model is capable of using the hydrograph generation methodology recommended by the Soil Conservation Service (SCS, 1964) to estimate design hydrographs from selected design storms. Runoff hydrographs for the 2, 5, 10, 25, 50, and 100-year storms were computed at selected locations within the project site. Storms hydrographs were also computed for the offsite area draining into the site.

The watershed delineation for the site and offsite contributing areas is presented in Figure 4. Under existing and proposed conditions the project site was divided into two subareas: Drainage Area 1 (DA-1) located to the south of the PR-466 road and Drainage Area 2 (DA-2) located to the north of the PR-466 road. Offsite runoff generated at the adjacent steep area on the south (Offsite 1) drains into the project site DA-1. Likewise, runoff generated at the developed area adjacent to the project site on the west, drain into DA-2. As result of field inspections and topographic survey data it appears that runoff generated at the site and/or entering the site from adjacent properties does not discharge outside the project area. Its seems that runof at the site percolates and/or evaporates.

2.2 Watershed Parameters

2.2.1 Drainage Area, Curve Number and Times of Concentration

The principal watershed parameters considered for the development of runoff hydrographs using the SCS method are: the drainage area, the time of concentration (TC) and the SCS curve number (CN). The time of concentration is considered as a measure of how fast the watershed may respond to a rainfall event. The curve number is an index of the infiltration loss potential of the watershed. It is a function of the soil

type, hydrologic soil group, land use, soil cover and the antecedent moisture condition. The CN values used in this study are representative of average antecedent soil moisture conditions (AMC II).

Data to compute weighted curve numbers were obtained from the SCS Soil Survey of Mayaguez Are of Western of Puerto Rico (SCS, 1978), the U.S. Geological Survey (USGS) topographic maps for Isabela (USGS, 1964) and field observations.

Soils series found within the studied are were classified as Coastal Beach (Ch), Cata_o Sand (Cd) and Rio Lajas (RiB). These soils series have hydrologic classification of A. Soils of the offsite area adjacent to the site on the south (Offsite 1) are Limestone Outcrop with hydrologic classification of D. On the other hand, Cata_o Sand (Cd) and Rio Lajas (RiB) soils whith hydrologic classification of A were found at the adjacent property to the site on the west (Offsite 2).

For the selection of the CNs, grassland and short brush were used as cover type for the project under existing conditions. Also, hydrologic conditions was fair. For the Offsite area to the south, brush as the major element was used as cover type and good hydrologic conditions. The Offsite-2 was considered fully developed. Under proposed conditions, at the project site the impermeable area was 25% and 5% for DA-1 and DA-2 respectively. These low percentages are explained by the use of permeable material for the parking areas and the preservation of major green areas

Data for computation of the times of concentration were obtained from the USGS topographic maps, the Topographic Survey Map provided by the client, and field observations. The Upland method was used to estimate the time of concentration for the project site and offsite area contributing to the site. At the offsite area to the south, land is very steep, 14% slope. However, the land is covered completely by heavy vegetation where runoff velocity is expected to be low. On the other hand, at the fully developed offsite area located to the west of the project site, runoff run on concrete surface. Also, at the project site, land is covered by grass and brush and the slope is low, generating low velocities (0.95-1.2 ft/sec.). A summary of the computed watershed parameters is presented in Table 1.

2.2.2 Rainfall Data

Rainfall depth - duration data for the 2, 5, 10, 25, 50, and 100-years storm events were generated using data from the Technical Paper No. 42 (USDC, 1961). The rainfall data are shown in Table 2. To develop runoff hydrographs for a particular storm duration, the rainfall depth obtained from Table 2 needs to be distributed in time and space. The temporal distribution of rainfall for this project was simulated using a Triangular rainfall distribution.

2.3 Hydrologic Results

The HEC-1 model was executed to evaluate the 2, 5, 10, 25, 50, and 100 year event peak flows for 24 hours duration storms for the project site and adjacent offsite areas. The results of the hydrologic evaluation are summarized in Tables 3 and 4 for existing and proposed conditions, respectively. The HEC-1 model computer printouts for the hydrologic evaluations under existing and proposed conditions are included in Appendix 1 and 3, respectively.

The results of the hydrologic evaluation indicated that the project site runoff peak flows are expected to increase significantly after the construction of the proposed project. The flow increases are explained by the change in land use proposed for the project (from undeveloped to developed land mostly) and the faster flow travel times associated with the development. However, the potential impact of the development in the hydrologic conditions is expected to be reduced by keeping the impermeable area at the minimum level. In this way, the parking material to be installed will be permeable. In addition, only the 18% of the area will be covered by impermeable material. The remaining of the area will be kept as green areas.

3.0 HYDRAULIC EVALUATION

3.1 Existing Conditions Evaluation

Under existing conditions, runoff generated at the portion of the site south of the PR-466 drains toward a low-laying area located at the southeastern corner of the site and eventually percolates into the subsurface and/or discharge into the northern portion through a pipe system located under the PR-466 road. Runoff generated at the portion of the site located to the north of the PR-466 road drains toward the eastern portion of the site and eventually evaporate and/or infiltrates into the subsurface. To evaluate the storage capacity of the low areas located within the site and the hydraulic capacity of the structure located under the PR-466 road, a hydraulic evaluation was conducted.

Hydraulic computations for the runoff storage system located within the property were conducted using the USACE HEC-1 computer model. In addition to its hydrologic capabilities, HEC-1 is capable of simulating the routing of a flood wave through reservoirs or detention ponds. Storage routing is used to simulate the flood wave movement through river reaches or reservoirs and to define outflow hydrographs at the exit point of the reservoir and the expected flood elevations at the reservoir area. For this study the reservoir routing method available in the HEC-1 model was used.

The hydraulic evaluation for the structure under the PR-466 was performed assuming one-dimensional steady gradually varied flow. The March 2001 version of the Hydrologic Engineering Center's River Analysis System (HEC-RAS) computer model developed by the United State Army Corps of Engineers (USACE, 2001) was used for the hydraulic simulations. HEC-RAS is an integrated system of software, designed for interactive use in multi-tasking, multi-user network environment. The system comprises a graphical user interface, separate hydraulic analysis components, data storage and management capabilities and graphic and reporting facilities.

HEC-RAS is capable of simulating natural and constructed channels with irregular cross sections,

variable roughness, changing slopes, incremental flows, bridges and other structures and variable flow regimes. HEC-RAS computes various hydraulic parameters such as flood stages, velocities, top widths and other hydraulics characteristics at discrete points within a river system. Discrete points along the river are represented by cross sections. HEC-RAS is also capable of importing HEC-2 (USACE, 1991) data, and to simulate one-dimensional sediment transport resulting from scour and deposition. HEC-RAS has been designed by the USACE as their next generation of one-dimensional river system analyses and is expected to replace the HEC-2 computer model.

The existing topographic data, geometry data for the structures, and the hydrologic data were coded onto the HEC-RAS Model to estimate flood elevations at the entrance of the existing 24" culvert pipe located under the PR-466 road. Manning roughness coefficients (N's) were selected based on field observations, professional experience and published data. Channel N's values used for the model were 0.06 for channel and overbank. Detail results generated by HEC-RAS model are included as Appendix 2. The rating curve (discharge vs. elevations) generated at the entrance of the pipe culvert is presented as Figure 5. The values for this figure were obtained from the HEC-RAS model results.

The area-elevation curve for the project site area located to the south of the PR-466 (DA-1) as obtained from the topographic data is presented as Figure 6. This rating curve and the aforementioned rating curve for the structure under the PR-466 were coded into the HEC-1 model to determine the storage capacity of the low-laying area located to the south of the PR-466. The HEC-1 results as presented in Appendix 1 indicate that the maximum flood elevation generated by the Offsite-1 and the project DA-1 at the PR-466 is about 6.23 meter. Since the minimum elevation of this road is about 6.5, overtopping is not expected to occur.

The area-elevation curve for the project site area located to the north of the PR-466 road (DA-2) as obtained from the topographic data is presented as Figure 7. This rating curve was coded into the HEC-1 model to determine the storage capacity of the low-laying area located to the north of the PR-466 road. The minimum percolation rate of 7.0 inches/hour reported for the project soil (the soil survey report indicate a range of 6-20 inches/hour) was used as outflow from the site. The HEC-1 results as presented

in Appendix 1 indicate that the maximum flood elevation generated at the project site is about 2.31 meters. The 100-year flood boundary delineation within the site is shown in Figure 8. These results indicate that runoff surface discharges are not expected to occur outside of the project area.

3.2 Proposed Conditions Evaluation (Runoff Detention-Control System)

The HEC-1 computer model was modified to consider conditions after the construction of the proposed project to simulate the impact of the proposed runoff control structures for mitigation of the excess runoff. One proposed structure will be constructed at the southern portion of the site. The other runoff control structure will be constructed at the northern portion of the site. The location of the proposed retention structures are shown in Figure 2. The structures will consist of retention pond without outlet structure, except for the emergency outlet structure located at the top of the structures. It is expected that the stored runoff will percolate through the high permeable sandy soil at the area.

Each of the proposed ponds will occupied a mean surface area of approximately 1.5 acres. The pond located to the south of the PR-466 within DA-1 will have the bottom at elevation of 2.0 meters and will provide a maximum storage capacity of 16,269 cubic meters at the expected 100-year flood elevation of 4.68 meters. Also, the pond located at the northern portion of the site within DA-2 will have the bottom at elevation of 1.0 meters and will provide a maximum storage capacity of 13,416 cubic meters at the expected 100-year flood elevation of 3.21 meters. Each of the proposed pond will have an emergency outflow structure above the 100-year flood elevation. The emergency structure for the pond being proposed at the southern portion of the site (DA-1) is presented as Figure 9. This structure will be located under the PR-466 and will be connected to the pond at DA-2. Also, the emergency structure for the Pond at DA-2 will be installed to discharge to the Sea. The invert elevation of this structure should be above the expected coastal flood elevation of 2.3 meters for the area, to avoid intrusion of the Sea into the system. Conceptual design of the detention systems are presented in Figures 10 and 11, for DA-1 and DA-2 respectively.

We note that for purposes of this study it is assumed that the design storage capacity of the detention pond to be constructed for the project will be available prior to the occurrence of the design storm event. Long term accumulation of water and/or sedimentation in the pond may impact the hydraulic performance herein presented. Evaluation of such condition was not part of the scope of this study. We also note that the designer engineers must assure that the total runoff generated within the project site is directed toward the proposed ponds.

The HEC-1 model computer printout for the proposed conditions simulation is included in Appendix 3.

The results of the proposed conditions evaluation indicate that once the proposed retention systems are implemented, the peak flows generated within the project site, including runoff generated at offsite areas, would not discharge outside of the project area as is expected under existing conditions. Therefore, the proposed development is in compliance with Puerto Rico Planning Board Regulation No. 3, Section 14.04.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Based upon the results obtained during this study, the following is concluded:

- The peak flows computed under existing and proposed conditions for the project area indicated that runoff peak flows are expected to increase after the construction of the proposed project. The flow increases are explained by the change in land use proposed for the project. However, the potential impact of the development in the hydrologic conditions is expected to be reduced by keeping the impermeable area at the minimum level. In this way, the parking material to be installed will be permeable. In addition, only the 18% of the area will be covered by impermeable material. The remaining of the area will be kept as green areas.

- To meet the requirements of Section 14.04 of the Puerto Rico Planning Board (JP) "Reglamento Núm. 3" two runoff retention-control were evaluated. These systems are proposed to avoid an increase in runoff discharges outside of the project area once the proposed project is constructed, when compare with the runoff discharges under existing conditions.

- The results of this study indicate that once the proposed runoff retention-control system are implemented, the runoff peak flows from the proposed project area, under existing conditions, would not increase. Proposed conditions peak flows will be equal to or less than those expected under existing conditions. Therefore, the proposed development is not expected to increase the existing conditions runoff peak flows being discharged from the project area for any of the rainfall events evaluated, once the runoff retention-control systems are implemented.

- Based upon the results of this study the implementation of the project proposed by, as described in this report, is consistent with the requirements of the PR Planning Board Regulation No. 13 and Section 14.04 of the Puerto Rico Planning Board (JP) "Reglamento Núm. 3".

4.2 Recommendations

Based upon the results of this investigation the following is recommended:

- Even though the project site is located outside of the coastal flooding at the area and therefore, it

is not required to comply with Section 7.00 of the PR Planning Board Regulation No. 13, the residential and hotel area being proposed should be constructed with a minimum finished floor elevation equal to or greater than the coastal 100-year flood elevations of 2.3 meters reported for the area by FEMA.

· For purposes of this study it is assumed that the design storage capacity of the retention ponds to be constructed for the project will be available prior to the occurrence of the design storm event. Long term accumulation of water and/or sedimentation in the ponds may impact the hydraulic performance herein presented. Evaluation of such condition was not part of the scope of this study. We recommend that, after the runoff retention-control system for this project be constructed, a regular maintenance program be implemented to minimize the possibility that the hydraulic capacity of the system be affected by sedimentation and/or debris accumulation.

5.0 REFERENCES

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TABLES

TABLE 1
Summary of Watershed Parameters
Existing and Proposed Conditions

Sub-basin (ID)	Existing Conditions Drainage Area (acre-sq. miles)	Proposed Conditions Drainage Area (acre-sq. miles)	Existing Conditions CN*	Proposed Conditions CN*	Existing Conditions TC(minute)	Proposed Conditions TC(minute)
PROJECT SITE						
South of PR-466 (DA-1)	14.46-0.0226	14.46-0.0226	49	52	6.80	5.00
North of PR-466 (DA-2)	30.02-0.0469	30.02-0.0469	49	61	18.70	13.00
OFFSITE AREA						
Adjacent to the south (Offsite 1)	23.74-0.0371	23.74-0.0371	73	73	15.18	15.18
Adjacent to the west (Offsite 2)	4.42-0.0069	4.42-0.0069	77	77	1.75	1.75

*Note: For the selection of the CNs, grassland and short brush were used as cover type for the project under existing conditions. Also, hydrologic conditions was fair. For the Offsite area to the south, brush as the major element was used as cover type and good hydrologic conditions. The Offsite-2 was considered fully developed. Under proposed conditions, the impermeable area was 25% and 5% for DA-1 and DA-2 respectively. These low percentages are explained by the use of permeable material for the parking areas and the preservation of major green areas.

TABLE 2
Rainfall Data
(depths in inches)*

Rainfall * Durations	**2-Year Recurrence Interval**	**5-Year Recurrence Interval**	**10-Year Recurrence Interval**	**25-Year Recurrence Interval**	**50-Year Recurrence Interval**	**100-Year Recurrence Interval**
**5	0.68	0.74	0.93	1.00	1.08	1.24
**15 minutes	1.12	1.35	1.69	1.83	1.97	2.25
30 minutes	1.50	2.00	2.25	2.50	2.75	3.00
1.0 hours	2.00	2.40	3.00	3.25	3.50	4.00
2.0 hours	2.25	3.00	3.50	4.50	5.00	5.50
3.0 hours	2.50	3.50	4.25	5.00	5.25	6.00
6.0 hours	3.00	4.50	5.10	6.00	7.00	8.00
12.0 hours	4.00	5.50	6.50	7.75	8.90	10.00
24.0 hours	4.50	6.25	7.25	8.50	10.10	12.00

Notes:

* Rainfall depths obtained from the TP-42 for the area of Isabela

** Rainfall depths for 5 and 15 minutes were estimated from published empirical rainfall depth-durations formulas (Chen, 1983).

TABLE 3
Summary of Hydrologic Results
Existing Conditions

Sub-Basin (ID)	2-Year Recurrence Interval	5-Year Recurrence Interval	10-Year Recurrence Interval	25-Year Recurrence Interval	50-Year Recurrence Interval	100-Year Recurrence Interval
	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)
PROJECT SITE						
South of PR-466 (DA-1)	4	15	26	37	51	70
North of PR-466 (DA-2)	7	24	41	58	78	107
OFFSITE AREA						
Adjacent to site on the south (Offsite 1)	46	72	98	115	133	161
Adjacent to site on the west (Offsite 2)	17	24	32	37	41	49

Notes: Flows computed for AMC II condition

TABLE 4
Summary of Hydrologic Results
Proposed Conditions

Sub-Basin (ID)	2-Year Recurrence Interval	5-Year Recurrence Interval	10-Year Recurrence Interval	25-Year Recurrence Interval	50-Year Recurrence Interval	100-Year Recurrence Interval
	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)
PROJECT SITE						
South of PR-466 (DA-1)	7	24	39	53	69	92
North of PR-466 (DA-2)	32	62	91	114	139	176
OFFSITE AREA						
Adjacent to site on the south (Offsite 1)	46	72	98	115	133	161
Adjacent to site on the west (Offsite 2)	17	24	32	37	41	49

Notes: Flows computed for AMC II condition

FIGURES

APPENDICES

APPENDIX 1
HEC-1 Model Computer Printout - Existing Conditions

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1****************************************
              ****************************************
 *                                      *
              *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
              *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *
              *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *
              *          609 SECOND STREET           *
 *                                      *
              *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   09JUL07  TIME  11:20:33   *
              *           (916) 756-1104             *
 *                                      *
              *                                      *
 ****************************************
              ****************************************
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```
                                                    X     X  XXXXXXX   XXXXX
    X
                                                    X     X  X        X     X
   XX
                                                    X     X  X        X
    X
                                                    XXXXXXX  XXXX    X      XXXXX
  X
                                                    X     X  X        X
    X
                                                    X     X  X        X     X
    X
                                                    X     X  XXXXXXX   XXXXX
   XXX
```

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

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

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

             1           ID  EXISTING CONDITIONS   FILE:EXISTING

             2           ID  HYDROLOGY CONDITIONS      SITE        VILLAS DEL
MAR HAU
             3           ID  , 5, 10, 25, 50 AND 100 YEAR FREQUENCY FLOW

             4           ID                  24 HOURS DURATION

                         *DIAGRAM

             5           IT       5       0       0     300

             6           IO       3

             7           JP       6


             8           KK    OFF1OFFSITE RUNOFF FROM SOUTH AREA

             9           KP       1

            10           BA  0.0371

            11           LS       0      73

            12           UD  0.1518

            13           KM  2 YEAR

            14           PH       0       0   0.618   1.124    2.00    2.25
 2.50     3.0     4.0    4.50
            15           KP       2

            16           KM  5 YEAR

            17           PH       0       0  0.7416   1.349    2.40     3.0
  3.5     4.5     5.5    6.25
            18           KP       3

            19           KM  10YEAR

            20           PH       0       0   0.927   1.686     3.0    3.50
 4.25    5.10    6.50    7.25
            21           KP       4

            22           KM  25YEAR

            23           PH       0       0   1.004   1.826    3.25    4.50
 5.00    6.00    7.75    8.50
            24           KP       5
```

```
             25           KM  50YEAR
             26           PH       0       0    1.08   1.967    3.50    5.00
 5.25    7.00    8.90   10.10
             27           KP       6
             28           KM  00YEAR
             29           PH       0       0   1.236    2.25    4.00    5.50
 6.00    8.00   10.00   12.00
             30           KK    DA-1SOUTH AREA OF PROJECT
             31           KP       1
             32           BA  0.0226
             33           LS       0      49
             34           UD   0.068
             35           KM  2 YEAR
             36           PH       0       0   0.618   1.124    2.00    2.25
 2.50     3.0     4.0    4.50
             37           KP       2
             38           KM  5 YEAR
             39           PH       0       0  0.7416   1.349    2.40     3.0
  3.5     4.5     5.5    6.25
             40           KP       3
             41           KM  10YEAR
             42           PH       0       0   0.927   1.686     3.0    3.50
 4.25    5.10    6.50    7.25
             43           KP       4
             44           KM  25YEAR
             45           PH       0       0   1.004   1.826    3.25    4.50
 5.00    6.00    7.75    8.50
             46           KP       5
             47           KM  50YEAR
             48           PH       0       0    1.08   1.967    3.50    5.00
 5.25    7.00    8.90   10.10
             49           KP       6
             50           KM  00YEAR
             51           PH       0       0   1.236    2.25    4.00    5.50
 6.00    8.00   10.00   12.00
1                                                    HEC-1 INPUT
                                PAGE  2
```

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

             52           KK  COMB.1EXTERNA SOUTH (1) AND PROJECT SOUTH (DA1)

             53           HC       2


             54           KK   POND1(AREA STORAGE PROJECT SOUTH AREA)

             55           RS       1    ELEV   11.48

             56           SA       0     0.3    0.75       1     1.5     1.5
  1.5     1.5     1.5     1.5
             57           SE   11.48  13.124   16.41   19.69   21.49   21.72
21.78   21.88   21.95   22.02
             58           SQ       0      16   34.78   58.12   70.62  105.93
141.24  176.55  211.86  247.17


             59           KK    DA-2 NORTH AREA OF  PROJECT

             60           KP       1

             61           BA  0.0469

             62           LS       0      49

             63           UD  0.1870

             64           KM  2 YEAR

             65           PH       0       0   0.618   1.124    2.00    2.25
 2.50     3.0     4.0    4.50
             66           KP       2

             67           KM  5 YEAR

             68           PH       0       0  0.7416   1.349    2.40     3.0
  3.5     4.5     5.5    6.25
             69           KP       3

             70           KM  10YEAR

             71           PH       0       0   0.927   1.686     3.0    3.50
 4.25    5.10    6.50    7.25
             72           KP       4

             73           KM  25YEAR

             74           PH       0       0   1.004   1.826    3.25    4.50
 5.00    6.00    7.75    8.50
             75           KP       5
```

```
             76           KM  50YEAR
             77           PH       0       0    1.08   1.967    3.50    5.00
 5.25    7.00    8.90   10.10
             78           KP       6
             79           KM  00YEAR
             80           PH       0       0   1.236    2.25    4.00    5.50
 6.00    8.00   10.00   12.00
             81           KK    OFF2OFFSITE RUNOFF FROM WESTERN AREAS AND SO
             82           KP       1
             83           BA  0.0069
             84           LS       0      77
             85           UD  0.0175
             86           KM  2 YEAR
             87           PH       0       0   0.618   1.124    2.00    2.25
 2.50     3.0     4.0    4.50
             88           KP       2
             89           KM  5 YEAR
             90           PH       0       0  0.7416   1.349    2.40     3.0
  3.5     4.5     5.5    6.25
             91           KP       3
             92           KM  10YEAR
             93           PH       0       0   0.927   1.686     3.0    3.50
 4.25    5.10    6.50    7.25
             94           KP       4
             95           KM  25YEAR
             96           PH       0       0   1.004   1.826    3.25    4.50
 5.00    6.00    7.75    8.50
             97           KP       5
             98           KM  50YEAR
             99           PH       0       0    1.08   1.967    3.50    5.00
 5.25    7.00    8.90   10.10
            100           KP       6
            101           KM  00YEAR
            102           PH       0       0   1.236    2.25    4.00    5.50
 6.00    8.00   10.00   12.00
1                                                    HEC-1 INPUT
                                PAGE  3
```

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

            103           KK  ROUTING THROUGH PROJECT SITE

            104           RM       1  0.3116    0.12


            105           KK   COMB2TOTAL OFFSITE AND SITE AREAS

            106           HC       3


            107           KK  ROUTING THROUGH PROJECT SITE POND

            108           RS       1    ELEV    1.64

            109           SA       0  0.0024   0.214  0.7161   4.889  13.256
18.308
            110           SE    1.64   3.281    4.92    5.74    6.56   9.843
13.124
            111           SQ       0   0.017   1.511    5.06   34.50   93.55
129.21
            112           ZZ

1
                SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

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

     8        OFF1
                 .
                 .
    30           .        DA-1
                 .           .
                 .           .
    52      COMB.1...........
                 V
                 V
    54       POND1
                 .
                 .
    59           .        DA-2
                 .           .
                 .           .
    81           .           .        OFF2
                 .           .          V
                 .           .          V
   103           .           .      ROUTIN
                 .           .           .
                 .           .           .
   105       COMB2.....................
```

```
                V
                V
   107      ROUTIN

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
             ****************************************
 *                                      *
             *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
             *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *
             *    HYDROLOGIC ENGINEERING CENTER     *
 *            VERSION 4.1               *
             *          609 SECOND STREET           *
 *                                      *
             *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   09JUL07  TIME  11:20:33   *
             *           (916) 756-1104             *
 *                                      *
             *                                      *
 ****************************************
             ****************************************



                          EXISTING CONDITIONS   FILE:EXISTING

                          HYDROLOGY CONDITIONS      SITE        VILLAS DEL MAR
HAU
                          , 5, 10, 25, 50 AND 100 YEAR FREQUENCY FLOW

                                        24 HOURS DURATION


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

      IT          HYDROGRAPH TIME DATA
                         NMIN           5  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1    0  STARTING DATE
                        ITIME        0000  STARTING TIME
                           NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2    0  ENDING DATE
                       NDTIME        0055  ENDING TIME
                       ICENT          19  CENTURY MARK

                    COMPUTATION INTERVAL     .08 HOURS
                         TOTAL TIME BASE   24.92 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA         SQUARE MILES
                 PRECIPITATION DEPTH   INCHES
```

```
                LENGTH, ELEVATION     FEET
                FLOW                  CUBIC FEET PER SECOND
                STORAGE VOLUME        ACRE-FEET
                SURFACE AREA          ACRES
                TEMPERATURE           DEGREES FAHRENHEIT

      JP          MULTI-PLAN OPTION
                        NPLAN           6  NUMBER OF PLANS

      JR          MULTI-RATIO OPTION
                      RATIOS OF RUNOFF
                     1.00


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


              **************
              *            *
    8 KK      *      OFF1  *     OFFSITE RUNOFF FROM SOUTH AREA
              *            *
              **************


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

    9 KP        PLAN  1 FOR STATION     OFF1          OFFSITE RUNOFF FROM SOUTH
AREA
                          2 YEAR


                SUBBASIN RUNOFF DATA

   10 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .04  SUBBASIN AREA

                  PRECIPITATION DATA

   14 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .62    1.12    2.00    2.25    2.50    3.00    4.00    4.50
    .00     .00     .00     .00

                                                      STORM AREA =     .04

   11 LS          SCS LOSS RATE
                        STRTL          .74  INITIAL ABSTRACTION
                       CRVNBR        73.00  CURVE NUMBER
                        RTIMP          .00  PERCENT IMPERVIOUS AREA
```

```
   12 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .15  LAG

                                                                    ***

                                                                 UNIT HYDROGRAPH
                                                              11 END-OF-PERIOD
ORDINATES
                  34.       90.       81.       41.       21.       10.
5.        3.        1.        1.
                   0.

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

                           HYDROGRAPH AT STATION     OFF1
                             FOR PLAN 1, RATIO = 1.00

     TOTAL RAINFALL =    4.50, TOTAL LOSS =    2.60, TOTAL EXCESS =    1.90

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      46.     12.17                      6.          2.          2.          2.
                         (INCHES)     1.591       1.896       1.896       1.896
                          (AC-FT)        3.          4.          4.          4.

                           CUMULATIVE AREA =     .04 SQ MI


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

                           HYDROGRAPH AT STATION     OFF1
                             FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      46.     12.17                      6.          2.          2.          2.
                         (INCHES)     1.591       1.896       1.896       1.896
                          (AC-FT)        3.          4.          4.          4.

                           CUMULATIVE AREA =     .04 SQ MI


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

   15 KP        PLAN  2 FOR STATION     OFF1          OFFSITE RUNOFF FROM SOUTH
AREA
                           5 YEAR


                  SUBBASIN RUNOFF DATA
```

```
   10 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .04  SUBBASIN AREA

                  PRECIPITATION DATA

   17 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .74    1.35    2.40    3.00    3.50    4.50    5.50    6.25
    .00     .00     .00     .00

                                                          STORM AREA =     .04

   11 LS          SCS LOSS RATE
                       STRTL         .74  INITIAL ABSTRACTION
                      CRVNBR       73.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   12 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .15  LAG

                                                                  ***

                                                              UNIT HYDROGRAPH
                                                          11 END-OF-PERIOD
ORDINATES
                  34.       90.       81.       41.       21.       10.
5.        3.        1.        1.
                   0.

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

                           HYDROGRAPH AT STATION     OFF1
                             FOR PLAN 2, RATIO = 1.00

     TOTAL RAINFALL =    6.25, TOTAL LOSS =    2.95, TOTAL EXCESS =    3.30

  PEAK FLOW     TIME                            MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                            (CFS)
+      72.     12.17                       11.          3.          3.          3.
                           (INCHES)     2.711       3.297       3.297       3.297
                            (AC-FT)       5.          7.          7.          7.

                           CUMULATIVE AREA =     .04 SQ MI


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

                           HYDROGRAPH AT STATION     OFF1
                             FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                            MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
```

```
+   (CFS)       (HR)
                          (CFS)
+      72.     12.17                    11.          3.          3.          3.
                        (INCHES)     2.711       3.297       3.297       3.297
                         (AC-FT)       5.          7.          7.          7.

                          CUMULATIVE AREA =     .04 SQ MI


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

   18 KP        PLAN  3 FOR STATION     OFF1          OFFSITE RUNOFF FROM SOUTH
AREA
                            10YEAR


                SUBBASIN RUNOFF DATA

   10 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .04  SUBBASIN AREA

                  PRECIPITATION DATA

   20 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .93    1.69    3.00    3.50    4.25    5.10    6.50    7.25
    .00     .00     .00     .00

                                                      STORM AREA =     .04

   11 LS          SCS LOSS RATE

                         STRTL         .74  INITIAL ABSTRACTION
                        CRVNBR       73.00  CURVE NUMBER
                         RTIMP         .00  PERCENT IMPERVIOUS AREA

   12 UD          SCS DIMENSIONLESS UNITGRAPH
                          TLAG         .15  LAG

                                                                  ***

                                                          UNIT HYDROGRAPH
                                                      11 END-OF-PERIOD
ORDINATES
                  34.       90.       81.       41.       21.       10.
5.        3.        1.        1.
                   0.

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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 3, RATIO = 1.00
```

```
     TOTAL RAINFALL =    7.25, TOTAL LOSS =    3.10, TOTAL EXCESS =    4.15

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      98.     12.17                   14.         4.          4.          4.
                         (INCHES)     3.427       4.151       4.151       4.151
                          (AC-FT)       7.          8.          8.          8.

                          CUMULATIVE AREA =     .04 SQ MI


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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      98.     12.17                   14.         4.          4.          4.
                         (INCHES)     3.427       4.151       4.151       4.151
                          (AC-FT)       7.          8.          8.          8.

                          CUMULATIVE AREA =     .04 SQ MI


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

   21 KP        PLAN  4 FOR STATION     OFF1          OFFSITE RUNOFF FROM SOUTH
AREA
                           25YEAR


                SUBBASIN RUNOFF DATA

   10 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .04  SUBBASIN AREA

                  PRECIPITATION DATA

   23 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                   1.00    1.83    3.25    4.50    5.00    6.00    7.75    8.50
    .00     .00     .00     .00

                                                    STORM AREA =     .04

   11 LS          SCS LOSS RATE
```

```
                        STRTL         .74  INITIAL ABSTRACTION
                       CRVNBR       73.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   12 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .15  LAG

                                                                  ***

                                                              UNIT HYDROGRAPH
                                                           11 END-OF-PERIOD
ORDINATES
                  34.       90.       81.       41.       21.       10.
5.        3.        1.        1.
                   0.

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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 4, RATIO = 1.00

     TOTAL RAINFALL =    8.50, TOTAL LOSS =    3.24, TOTAL EXCESS =    5.26

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+     115.     12.17                  17.         5.          5.          5.
                         (INCHES)     4.377       5.255       5.255       5.255
                          (AC-FT)       9.         10.         10.         10.

                          CUMULATIVE AREA =     .04 SQ MI


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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+     115.     12.17                  17.         5.          5.          5.
                         (INCHES)     4.377       5.255       5.255       5.255
                          (AC-FT)       9.         10.         10.         10.

                          CUMULATIVE AREA =     .04 SQ MI


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

   24 KP        PLAN  5 FOR STATION     OFF1          OFFSITE RUNOFF FROM SOUTH
AREA
```

50YEAR

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

26 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
1.08	1.97	3.50	5.00	5.25	7.00	8.90	10.10	.00	.00	.00	.00

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES

34.	90.	81.	41.	21.	10.	5.	3.	1.	1.
0.									

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 5, RATIO = 1.00

TOTAL RAINFALL = 10.10, TOTAL LOSS = 3.39, TOTAL EXCESS = 6.71

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	133.	12.17	21.	7.	6.	6.
			(INCHES) 5.303	6.709	6.709	6.709
			(AC-FT) 10.	13.	13.	13.

CUMULATIVE AREA = .04 SQ MI

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 5, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
133.	12.17	21.	7.	6.	6.
		(INCHES) 5.303	6.709	6.709	6.709
		(AC-FT) 10.	13.	13.	13.

CUMULATIVE AREA = .04 SQ MI

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

27 KP PLAN 6 FOR STATION OFF1 OFFSITE RUNOFF FROM SOUTH AREA
00YEAR

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

29 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
1.24	2.25	4.00	5.50	6.00	8.00	10.00	12.00	.00	.00	.00	.00

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES

34.	90.	81.	41.	21.	10.	5.	3.	1.	1.
0.									

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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 6, RATIO = 1.00

     TOTAL RAINFALL =   12.00, TOTAL LOSS =    3.52, TOTAL EXCESS =    8.48

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+     161.     12.17                25.          8.          8.           8.
                      (INCHES)     6.348       8.476       8.476        8.476
                       (AC-FT)      13.         17.         17.          17.

                       CUMULATIVE AREA =     .04 SQ MI


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

                          HYDROGRAPH AT STATION     OFF1
                            FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+     161.     12.17                25.          8.          8.           8.
                      (INCHES)     6.348       8.476       8.476        8.476
                       (AC-FT)      13.         17.         17.          17.

                       CUMULATIVE AREA =     .04 SQ MI



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


              **************
              *            *
   30 KK      *      DA-1  *     SOUTH AREA OF PROJECT
              *            *
              **************


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

   31 KP        PLAN  1 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                            2 YEAR


                SUBBASIN RUNOFF DATA
```

```
   32 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .02  SUBBASIN AREA

                  PRECIPITATION DATA

   36 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ..............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .62    1.12    2.00    2.25    2.50    3.00    4.00    4.50
    .00     .00     .00     .00

                                                        STORM AREA =     .02

   33 LS          SCS LOSS RATE
                       STRTL        2.08  INITIAL ABSTRACTION
                      CRVNBR       49.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   34 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .07  LAG

                                                                 ***

                                                             UNIT HYDROGRAPH
                                                          6 END-OF-PERIOD
ORDINATES
                 86.       64.       18.        5.        1.        0.

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

                          HYDROGRAPH AT STATION     DA-1
                            FOR PLAN 1, RATIO = 1.00

     TOTAL RAINFALL =    4.50, TOTAL LOSS =    4.04, TOTAL EXCESS =     .46

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)

                            (CFS)
+       4.     12.17                     1.          0.          0.           0.
                          (INCHES)      .369        .456        .456         .456
                           (AC-FT)        0.          1.          1.           1.

                          CUMULATIVE AREA =     .02 SQ MI


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

                          HYDROGRAPH AT STATION     DA-1
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
```

```
+   (CFS)       (HR)
                          (CFS)
+       4.     12.17                1.          0.          0.          0.
                       (INCHES)     .369        .456        .456        .456
                        (AC-FT)       0.          1.          1.          1.

                         CUMULATIVE AREA =     .02 SQ MI


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

   37 KP        PLAN  2 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                            5 YEAR


                SUBBASIN RUNOFF DATA

   32 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .02  SUBBASIN AREA

                  PRECIPITATION DATA

   39 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .74    1.35    2.40    3.00    3.50    4.50    5.50    6.25
    .00     .00     .00     .00

                                                      STORM AREA =     .02

   33 LS          SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   34 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .07  LAG

                                                                 ***

                                                          UNIT HYDROGRAPH
                                                      6 END-OF-PERIOD
ORDINATES
                 86.       64.       18.        5.        1.        0.

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

                           HYDROGRAPH AT STATION     DA-1
                             FOR PLAN 2, RATIO = 1.00

     TOTAL RAINFALL =    6.25, TOTAL LOSS =    5.06, TOTAL EXCESS =    1.19
```

```
  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+      15.     12.17                    2.          1.          1.           1.
                     (INCHES)      .995       1.192       1.192        1.192
                      (AC-FT)        1.          1.          1.           1.

                      CUMULATIVE AREA =     .02 SQ MI


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

                        HYDROGRAPH AT STATION     DA-1
                          FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+      15.     12.17                    2.          1.          1.           1.
                     (INCHES)      .995       1.192       1.192        1.192
                      (AC-FT)        1.          1.          1.           1.

                      CUMULATIVE AREA =     .02 SQ MI


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

   40 KP        PLAN  3 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                          10YEAR


                SUBBASIN RUNOFF DATA

   32 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .02  SUBBASIN AREA

                  PRECIPITATION DATA

   42 PH                              DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .93    1.69    3.00    3.50    4.25    5.10    6.50    7.25
    .00     .00     .00     .00

                                                    STORM AREA =     .02

   33 LS          SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA
```

```
   34 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .07  LAG

                                                                    ***

                                                                UNIT HYDROGRAPH
                                                             6 END-OF-PERIOD
ORDINATES
                 86.       64.       18.        5.        1.        0.

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

                          HYDROGRAPH AT STATION     DA-1
                            FOR PLAN 3, RATIO = 1.00

     TOTAL RAINFALL =    7.25, TOTAL LOSS =    5.54, TOTAL EXCESS =    1.71

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      26.     12.08                      4.          1.          1.          1.
                         (INCHES)     1.471       1.715       1.715       1.715
                          (AC-FT)        2.          2.          2.          2.

                          CUMULATIVE AREA =     .02 SQ MI


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

                          HYDROGRAPH AT STATION     DA-1
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      26.     12.08                      4.          1.          1.          1.
                         (INCHES)     1.471       1.715       1.715       1.715
                          (AC-FT)        2.          2.          2.          2.

                          CUMULATIVE AREA =     .02 SQ MI


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

   43 KP        PLAN  4 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                            25YEAR


                SUBBASIN RUNOFF DATA

   32 BA          SUBBASIN CHARACTERISTICS
```

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                        TAREA         .02  SUBBASIN AREA

                  PRECIPITATION DATA

   45 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                   1.00    1.83    3.25    4.50    5.00    6.00    7.75    8.50
    .00     .00     .00     .00

                                                        STORM AREA =     .02

   33 LS          SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   34 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .07  LAG

                                                                 ***

                                                             UNIT HYDROGRAPH
                                                          6 END-OF-PERIOD
ORDINATES
                86.       64.       18.        5.        1.        0.

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

                         HYDROGRAPH AT STATION     DA-1
                           FOR PLAN 4, RATIO = 1.00

     TOTAL RAINFALL =    8.50, TOTAL LOSS =    6.05, TOTAL EXCESS =    2.45

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      37.     12.08                     5.          1.          1.          1.
                        (INCHES)     2.122       2.448       2.448       2.448
                         (AC-FT)       3.          3.          3.          3.

                         CUMULATIVE AREA =     .02 SQ MI


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

                         HYDROGRAPH AT STATION     DA-1
                           FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      37.     12.08                     5.          1.          1.          1.
```

```
                        (INCHES)     2.122       2.448       2.448        2.448
                         (AC-FT)       3.          3.          3.           3.

                        CUMULATIVE AREA =     .02 SQ MI


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

  46 KP        PLAN  5 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                          50YEAR


               SUBBASIN RUNOFF DATA

  32 BA          SUBBASIN CHARACTERISTICS
                       TAREA         .02  SUBBASIN AREA

                 PRECIPITATION DATA

  48 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                 ..... HYDRO-35 ......   ............... TP-40 ...............
 ..... TP-49 ....
                 5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
 2-DAY   4-DAY   7-DAY  10-DAY
                  1.08    1.97    3.50    5.00    5.25    7.00    8.90   10.10
   .00     .00     .00     .00

                                                    STORM AREA =     .02

  33 LS          SCS LOSS RATE
                       STRTL        2.08  INITIAL ABSTRACTION
                      CRVNBR       49.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

  34 UD          SCS DIMENSIONLESS UNITGRAPH
                        TLAG         .07  LAG

                                                                 ***

                                                      UNIT HYDROGRAPH
                                                  6 END-OF-PERIOD
ORDINATES
                86.       64.       18.        5.        1.        0.

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

                         HYDROGRAPH AT STATION     DA-1
                           FOR PLAN 5, RATIO = 1.00

     TOTAL RAINFALL =   10.10, TOTAL LOSS =    6.61, TOTAL EXCESS =    3.49

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
```

```
                          (CFS)
+      51.     12.08                    7.          2.          2.          2.
                       (INCHES)     2.896       3.489       3.489       3.489
                        (AC-FT)       3.          4.          4.          4.

                        CUMULATIVE AREA =     .02 SQ MI


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

                      HYDROGRAPH AT STATION     DA-1
                        FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      51.     12.08                    7.          2.          2.          2.
                       (INCHES)     2.896       3.489       3.489       3.489
                        (AC-FT)       3.          4.          4.          4.

                        CUMULATIVE AREA =     .02 SQ MI


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

   49 KP         PLAN  6 FOR STATION     DA-1          SOUTH AREA OF PROJECT

                            00YEAR


                 SUBBASIN RUNOFF DATA

   32 BA           SUBBASIN CHARACTERISTICS
                         TAREA         .02  SUBBASIN AREA

                   PRECIPITATION DATA

   51 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                   1.24    2.25    4.00    5.50    6.00    8.00   10.00   12.00
    .00     .00     .00     .00

                                                    STORM AREA =     .02

   33 LS           SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   34 UD           SCS DIMENSIONLESS UNITGRAPH
                          TLAG         .07  LAG
```

```
                                                                      ***

                                                                  UNIT HYDROGRAPH
                                                               6 END-OF-PERIOD
ORDINATES
                86.       64.       18.        5.        1.        0.

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

                        HYDROGRAPH AT STATION     DA-1
                          FOR PLAN 6, RATIO = 1.00

     TOTAL RAINFALL =   12.00, TOTAL LOSS =    7.16, TOTAL EXCESS =    4.84

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      70.     12.08                  9.          3.          3.           3.
                        (INCHES)     3.792       4.839       4.839        4.839
                         (AC-FT)       5.          6.          6.           6.

                        CUMULATIVE AREA =     .02 SQ MI


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

                        HYDROGRAPH AT STATION     DA-1
                          FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      70.     12.08                  9.          3.          3.           3.
                        (INCHES)     3.792       4.839       4.839        4.839
                         (AC-FT)       5.          6.          6.           6.

                        CUMULATIVE AREA =     .02 SQ MI



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


             **************
             *            *
   52 KK     *    COMB.1  *     EXTERNA SOUTH (1) AND PROJECT SOUTH (DA1)
             *            *
             **************

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

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 1, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 51.	12.17	7.	2.	2.	2.
		(INCHES) 1.123	1.351	1.351	1.351
		(AC-FT) 4.	4.	4.	4.

CUMULATIVE AREA = .06 SQ MI

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 2, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 87.	12.17	13.	4.	4.	4.
		(INCHES) 2.040	2.500	2.500	2.500
		(AC-FT) 6.	8.	8.	8.

CUMULATIVE AREA = .06 SQ MI

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 3, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 124.	12.17	17.	5.	5.	5.
		(INCHES) 2.654	3.229	3.229	3.229
		(AC-FT) 8.	10.	10.	10.

CUMULATIVE AREA = .06 SQ MI

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

HYDROGRAPH AT STATION COMB.1

FOR PLAN 4, RATIO = 1.00

```
  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                    6-HR      24-HR       72-HR    24.92-HR
+   (CFS)       (HR)
                             (CFS)
+     150.     12.17                 22.          7.          6.          6.
                          (INCHES)  3.504       4.192       4.192       4.192
                           (AC-FT)    11.         13.         13.         13.

                          CUMULATIVE AREA =     .06 SQ MI


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

                           HYDROGRAPH AT STATION   COMB.1
                             FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                    6-HR      24-HR       72-HR    24.92-HR
+   (CFS)       (HR)
                             (CFS)
+     179.     12.17                 28.          9.          8.          8.
                          (INCHES)  4.388       5.490       5.490       5.490
                           (AC-FT)    14.         17.         17.         17.

                          CUMULATIVE AREA =     .06 SQ MI


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

                           HYDROGRAPH AT STATION   COMB.1
                             FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                           MAXIMUM AVERAGE FLOW
                                    6-HR      24-HR       72-HR    24.92-HR
+   (CFS)       (HR)
                             (CFS)
+     223.     12.17                 34.         11.         11.         11.
                          (INCHES)  5.335       7.099       7.099       7.099
                           (AC-FT)    17.         23.         23.         23.

                          CUMULATIVE AREA =     .06 SQ MI



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


             **************
             *            *
  54 KK      *     POND1  *     (AREA STORAGE PROJECT SOUTH AREA)
             *            *
             **************

                HYDROGRAPH ROUTING DATA
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```
   55 RS          STORAGE ROUTING
                       NSTPS           1  NUMBER OF SUBREACHES
                        ITYP        ELEV  TYPE OF INITIAL CONDITION
                       RSVRIC       11.48  INITIAL CONDITION
                            X         .00 WORKING R AND D COEFFICIENT

   56 SA              AREA          .0        .3        .8       1.0       1.5
      1.5       1.5       1.5       1.5       1.5


   57 SE          ELEVATION       11.48     13.12     16.41     19.69     21.49
    21.72     21.78     21.88     21.95     22.02


   58 SQ          DISCHARGE          0.       16.       35.       58.       71.
     106.      141.      177.      212.      247.


                                                                  ***

                                                    COMPUTED STORAGE-ELEVATION
DATA

            STORAGE        .00       .16      1.83      4.69      6.93      7.27
     7.36      7.51      7.62      7.72
          ELEVATION      11.48     13.12     16.41     19.69     21.49     21.72
    21.78     21.88     21.95     22.02


 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                  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    POND1
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                             (CFS)
+      23.     12.50                      7.          2.          2.          2.
                           (INCHES)     1.121       1.351       1.351       1.351
                            (AC-FT)       4.          4.          4.          4.

 PEAK STORAGE   TIME                       MAXIMUM AVERAGE STORAGE
                                        6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        1.     12.50                      0.          0.          0.          0.

  PEAK STAGE    TIME                        MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.92-HR
```

```
+   (FEET)      (HR)
     14.40     12.50                12.28       11.72       11.71        11.71

                          CUMULATIVE AREA =     .06 SQ MI


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

                PLAN  2 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN
1

 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                  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    POND1
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      33.     12.50                 13.          4.          4.           4.
                         (INCHES)    2.039       2.500       2.500        2.500
                          (AC-FT)      6.          8.          8.           8.

 PEAK STORAGE   TIME                         MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        2.     12.50                   0.          0.          0.           0.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
     16.06     12.50                13.05       11.95       11.93        11.93

                          CUMULATIVE AREA =     .06 SQ MI


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

                PLAN  3 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN
1

 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                  THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR
OUTFLOWS GREATER THAN PEAK INFLOWS.
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                  THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR
INCREASING STORAGE (USE A LONGER REACH.)

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

                          HYDROGRAPH AT STATION    POND1
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      41.     12.58                  17.          5.          5.           5.
                         (INCHES)    2.653       3.229       3.229        3.229
                          (AC-FT)      8.         10.         10.          10.

 PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        3.     12.58                   1.          0.          0.           0.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
     17.25     12.58                 13.63       12.11       12.09        12.09

                         CUMULATIVE AREA =     .06 SQ MI


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

                PLAN  4 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN
1

 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                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    POND1
                            FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      47.     12.58                  22.          7.          6.           6.
                         (INCHES)    3.500       4.192       4.192        4.192
                          (AC-FT)      11.         13.         13.          13.

 PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
```

```
                                        6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        3.     12.58                     1.          0.          0.           0.

  PEAK STAGE    TIME                            MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.92-HR

+   (FEET)      (HR)
     18.14     12.58                   14.37       12.32       12.29        12.29

                          CUMULATIVE AREA =     .06 SQ MI


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

                PLAN  5 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN
1

 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                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    POND1
                            FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                            MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      55.     12.58                    28.         9.          8.           8.
                        (INCHES)      4.381       5.490       5.490        5.490
                         (AC-FT)        14.         17.         17.          17.

 PEAK STORAGE   TIME                            MAXIMUM AVERAGE STORAGE
                                        6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        4.     12.58                     1.          0.          0.           0.

  PEAK STAGE    TIME                            MAXIMUM AVERAGE STAGE
                                        6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
     19.21     12.58                   15.19       12.59       12.55        12.55

                          CUMULATIVE AREA =     .06 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
  ***     ***     ***     ***     ***     ***     ***
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                PLAN  6 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN
1

 *** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS
BETWEEN      106. TO      247.
                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    POND1
                            FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                             (CFS)
+      63.     12.58                 34.         11.         11.          11.
                           (INCHES)     5.332       7.099       7.099        7.099
                            (AC-FT)      17.         23.         23.          23.

 PEAK STORAGE   TIME                        MAXIMUM AVERAGE STORAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        6.     12.58                  2.          1.          1.           1.

  PEAK STAGE    TIME                          MAXIMUM AVERAGE STAGE
                                      6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)

     20.44     12.58                16.10       12.93       12.87        12.87

                          CUMULATIVE AREA =     .06 SQ MI



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


              **************
              *            *
   59 KK      *      DA-2  *      NORTH AREA OF  PROJECT
              *            *
              **************


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

   60 KP        PLAN  1 FOR STATION     DA-2           NORTH AREA OF  PROJECT
```

2 YEAR

SUBBASIN RUNOFF DATA

61 BA SUBBASIN CHARACTERISTICS
TAREA .05 SUBBASIN AREA

PRECIPITATION DATA

65 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.62	1.12	2.00	2.25	2.50	3.00	4.00	4.50	.00	.00	.00	.00

STORM AREA = .05

62 LS SCS LOSS RATE
STRTL 2.08 INITIAL ABSTRACTION
CRVNBR 49.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

63 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .19 LAG

***

UNIT HYDROGRAPH
13 END-OF-PERIOD ORDINATES

26.	84.	98.	71.	37.	21.	12.	6.	4.	2.	1.	1.	0.

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

HYDROGRAPH AT STATION DA-2
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 4.50, TOTAL LOSS = 4.04, TOTAL EXCESS = .46

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
7.	12.33	2.	1.	1.	1.
		(INCHES) .365	.456	.456	.456
		(AC-FT) 1.	1.	1.	1.

CUMULATIVE AREA = .05 SQ MI

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

HYDROGRAPH AT STATION DA-2
FOR PLAN 1, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
7.	12.33	2.	1.	1.	1.
		(INCHES) .365	.456	.456	.456
		(AC-FT) 1.	1.	1.	1.

CUMULATIVE AREA = .05 SQ MI

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

66 KP PLAN 2 FOR STATION DA-2 NORTH AREA OF PROJECT

5 YEAR

SUBBASIN RUNOFF DATA

61 BA SUBBASIN CHARACTERISTICS
TAREA .05 SUBBASIN AREA

PRECIPITATION DATA

68 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .....
..... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.74	1.35	2.40	3.00	3.50	4.50	5.50	6.25	.00	.00	.00	.00

STORM AREA = .05

62 LS SCS LOSS RATE
STRTL 2.08 INITIAL ABSTRACTION
CRVNBR 49.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

63 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .19 LAG

***

UNIT HYDROGRAPH
13 END-OF-PERIOD ORDINATES

26.	84.	98.	71.	37.	21.	12.	6.	4.	2.	1.	1.	0.

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

                        HYDROGRAPH AT STATION     DA-2
                          FOR PLAN 2, RATIO = 1.00

     TOTAL RAINFALL =    6.25, TOTAL LOSS =    5.06, TOTAL EXCESS =    1.19

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+      24.     12.25                    5.          2.          1.          1.
                       (INCHES)      .991       1.192       1.192       1.192
                        (AC-FT)        2.          3.          3.          3.

                        CUMULATIVE AREA =     .05 SQ MI

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

                        HYDROGRAPH AT STATION     DA-2
                          FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR

+   (CFS)       (HR)
                         (CFS)
+      24.     12.25                    5.          2.          1.          1.
                       (INCHES)      .991       1.192       1.192       1.192
                        (AC-FT)        2.          3.          3.          3.

                        CUMULATIVE AREA =     .05 SQ MI


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

   69 KP        PLAN  3 FOR STATION     DA-2           NORTH AREA OF  PROJECT

                           10YEAR


                SUBBASIN RUNOFF DATA

   61 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .05  SUBBASIN AREA

                  PRECIPITATION DATA

   71 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
```

```
                  .93    1.69    3.00    3.50    4.25    5.10    6.50    7.25
    .00     .00     .00     .00

                                                    STORM AREA =     .05

   62 LS          SCS LOSS RATE
                       STRTL        2.08  INITIAL ABSTRACTION
                      CRVNBR       49.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   63 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .19  LAG

                                                                  ***

                                                         UNIT HYDROGRAPH
                                                    13 END-OF-PERIOD
ORDINATES
                26.       84.       98.       71.       37.       21.       12.
       6.        4.        2.
                 1.        1.        0.

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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 3, RATIO = 1.00

     TOTAL RAINFALL =    7.25, TOTAL LOSS =    5.53, TOTAL EXCESS =    1.71

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      41.     12.25                     7.          2.          2.          2.
                        (INCHES)     1.466       1.715       1.715       1.715
                        (AC-FT)        4.          4.          4.          4.

                         CUMULATIVE AREA =     .05 SQ MI


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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      41.     12.25                     7.          2.          2.          2.
                        (INCHES)     1.466       1.715       1.715       1.715
                        (AC-FT)        4.          4.          4.          4.

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

   72 KP        PLAN  4 FOR STATION     DA-2           NORTH AREA OF  PROJECT

                           25YEAR


                SUBBASIN RUNOFF DATA

   61 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .05  SUBBASIN AREA

                  PRECIPITATION DATA

   74 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                   1.00    1.83    3.25    4.50    5.00    6.00    7.75    8.50
    .00     .00     .00     .00

                                                        STORM AREA =     .05

   62 LS          SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   63 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .19  LAG

                                                              ***

                                                          UNIT HYDROGRAPH
                                                      13 END-OF-PERIOD
ORDINATES
                 26.       84.       98.       71.       37.       21.       12.
       6.         4.        2.
                   1.        1.        0.

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

                          HYDROGRAPH AT STATION     DA-2
                            FOR PLAN 4, RATIO = 1.00

     TOTAL RAINFALL =    8.50, TOTAL LOSS =    6.05, TOTAL EXCESS =    2.45

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                             (CFS)
+      58.     12.25                    11.          3.          3.          3.
                           (INCHES)     2.118       2.448       2.448       2.448
                            (AC-FT)       5.          6.          6.          6.
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                          CUMULATIVE AREA =     .05 SQ MI

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

                          HYDROGRAPH AT STATION     DA-2
                            FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                             (CFS)
+      58.     12.25                  11.          3.          3.           3.
                           (INCHES)    2.118       2.448       2.448        2.448
                            (AC-FT)      5.          6.          6.           6.

                          CUMULATIVE AREA =     .05 SQ MI


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

   75 KP         PLAN  5 FOR STATION     DA-2           NORTH AREA OF  PROJECT

                             50YEAR


                 SUBBASIN RUNOFF DATA

   61 BA           SUBBASIN CHARACTERISTICS
                         TAREA         .05  SUBBASIN AREA

                   PRECIPITATION DATA

   77 PH                                 DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                   ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                   5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    1.08    1.97    3.50    5.00    5.25    7.00    8.90   10.10
    .00     .00     .00     .00

                                                      STORM AREA =     .05

   62 LS           SCS LOSS RATE
                         STRTL        2.08  INITIAL ABSTRACTION
                        CRVNBR       49.00  CURVE NUMBER
                         RTIMP         .00  PERCENT IMPERVIOUS AREA

   63 UD           SCS DIMENSIONLESS UNITGRAPH
                          TLAG         .19  LAG

                                                                  ***

                                                              UNIT HYDROGRAPH
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                                                          13 END-OF-PERIOD
ORDINATES
                26.       84.       98.       71.       37.       21.       12.
       6.        4.        2.
                 1.        1.        0.

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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 5, RATIO = 1.00

     TOTAL RAINFALL =   10.10, TOTAL LOSS =    6.61, TOTAL EXCESS =    3.49

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      78.     12.25                  15.         4.          4.          4.
                         (INCHES)    2.891       3.489       3.489       3.489
                          (AC-FT)      7.          9.          9.          9.

                          CUMULATIVE AREA =     .05 SQ MI


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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      78.     12.25                  15.         4.          4.          4.
                         (INCHES)    2.891       3.489       3.489       3.489
                          (AC-FT)      7.          9.          9.          9.

                          CUMULATIVE AREA =     .05 SQ MI


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

   78 KP        PLAN  6 FOR STATION     DA-2           NORTH AREA OF  PROJECT

                          00YEAR


                SUBBASIN RUNOFF DATA

   61 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .05  SUBBASIN AREA

                  PRECIPITATION DATA

   80 PH                             DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
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                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                   1.24    2.25    4.00    5.50    6.00    8.00   10.00   12.00
    .00     .00     .00     .00

                                                        STORM AREA =     .05

   62 LS          SCS LOSS RATE
                        STRTL        2.08  INITIAL ABSTRACTION
                       CRVNBR       49.00  CURVE NUMBER
                        RTIMP         .00  PERCENT IMPERVIOUS AREA

   63 UD          SCS DIMENSIONLESS UNITGRAPH
                          TLAG         .19  LAG

                                                                  ***

                                                          UNIT HYDROGRAPH
                                                      13 END-OF-PERIOD
ORDINATES
                26.       84.       98.       71.       37.       21.       12.
       6.        4.        2.
                 1.        1.        0.

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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 6, RATIO = 1.00

     TOTAL RAINFALL =   12.00, TOTAL LOSS =    7.16, TOTAL EXCESS =    4.84

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+     107.     12.25                19.          6.          6.           6.
                         (INCHES)     3.787       4.839       4.839        4.839
                          (AC-FT)       9.         12.         12.          12.

                         CUMULATIVE AREA =     .05 SQ MI


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

                         HYDROGRAPH AT STATION     DA-2
                           FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+     107.     12.25                19.          6.          6.           6.
                         (INCHES)     3.787       4.839       4.839        4.839
                          (AC-FT)       9.         12.         12.          12.
```

```
                          CUMULATIVE AREA =     .05 SQ MI


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


             **************
             *            *
   81 KK     *      OFF2  *     OFFSITE RUNOFF FROM WESTERN AREAS AND SO
             *            *
             **************


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

   82 KP       PLAN  1 FOR STATION     OFF2         OFFSITE RUNOFF FROM WESTERN
AREAS AND SO
                         2 YEAR


               SUBBASIN RUNOFF DATA

   83 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .01  SUBBASIN AREA

                  PRECIPITATION DATA

   87 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .62    1.12    2.00    2.25    2.50    3.00    4.00    4.50
    .00     .00     .00     .00

                                                      STORM AREA =     .01

   84 LS          SCS LOSS RATE
                         STRTL         .60  INITIAL ABSTRACTION
                        CRVNBR       77.00  CURVE NUMBER
                         RTIMP         .00  PERCENT IMPERVIOUS AREA

   85 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .02  LAG

                                                                 ***

                                                             UNIT HYDROGRAPH
                                                         5 END-OF-PERIOD
ORDINATES
                 40.       11.        2.        0.        0.
```

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

                          HYDROGRAPH AT STATION     OFF2
                            FOR PLAN 1, RATIO = 1.00

     TOTAL RAINFALL =    4.50, TOTAL LOSS =    2.29, TOTAL EXCESS =    2.21

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+      17.     12.08                1.          0.          0.           0.
                       (INCHES)    1.837       2.211       2.211        2.211
                        (AC-FT)      1.          1.          1.           1.

                        CUMULATIVE AREA =     .01 SQ MI


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

                          HYDROGRAPH AT STATION     OFF2
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+      17.     12.08                1.          0.          0.           0.
                       (INCHES)    1.837       2.211       2.211        2.211
                        (AC-FT)      1.          1.          1.           1.

                        CUMULATIVE AREA =     .01 SQ MI


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

   88 KP       PLAN  2 FOR STATION     OFF2          OFFSITE RUNOFF FROM WESTERN
AREAS AND SO
                          5 YEAR


                SUBBASIN RUNOFF DATA

   83 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .01  SUBBASIN AREA

                PRECIPITATION DATA

   90 PH                               DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                  .74    1.35    2.40    3.00    3.50    4.50    5.50    6.25
    .00     .00     .00     .00
```

```
                                                    STORM AREA =     .01

   84 LS          SCS LOSS RATE
                       STRTL         .60  INITIAL ABSTRACTION
                      CRVNBR       77.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   85 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .02  LAG

                                                                ***

                                                          UNIT HYDROGRAPH
                                                       5 END-OF-PERIOD
ORDINATES
                40.       11.        2.        0.        0.

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

                         HYDROGRAPH AT STATION     OFF2
                           FOR PLAN 2, RATIO = 1.00

     TOTAL RAINFALL =    6.25, TOTAL LOSS =    2.55, TOTAL EXCESS =    3.70

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      24.     12.08                     2.          1.          1.          1.
                         (INCHES)     3.020       3.698       3.698       3.698
                          (AC-FT)        1.          1.          1.          1.

                         CUMULATIVE AREA =     .01 SQ MI


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

                         HYDROGRAPH AT STATION     OFF2
                           FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      24.     12.08                     2.          1.          1.          1.
                         (INCHES)     3.020       3.698       3.698       3.698
                          (AC-FT)        1.          1.          1.          1.

                         CUMULATIVE AREA =     .01 SQ MI


 ***     ***     ***     ***     ***     ***     ***     ***     ***     ***
  ***     ***     ***     ***     ***     ***     ***
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   91 KP       PLAN  3 FOR STATION    OFF2         OFFSITE RUNOFF FROM WESTERN
AREAS AND SO
                          10YEAR


                SUBBASIN RUNOFF DATA

   83 BA          SUBBASIN CHARACTERISTICS
                        TAREA         .01  SUBBASIN AREA

                  PRECIPITATION DATA

   93 PH                                DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
                  ..... HYDRO-35 ......   ............... TP-40 ...............
  ........... TP-49 ...........
                  5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR
  2-DAY   4-DAY   7-DAY  10-DAY
                    .93    1.69    3.00    3.50    4.25    5.10    6.50    7.25
    .00     .00     .00     .00

                                                        STORM AREA =     .01

   84 LS          SCS LOSS RATE
                       STRTL         .60  INITIAL ABSTRACTION
                      CRVNBR       77.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   85 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .02  LAG

                                                              ***

                                                          UNIT HYDROGRAPH
                                                      5 END-OF-PERIOD
ORDINATES
                 40.       11.        2.        0.        0.

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

                          HYDROGRAPH AT STATION     OFF2
                            FOR PLAN 3, RATIO = 1.00

     TOTAL RAINFALL =    7.25, TOTAL LOSS =    2.66, TOTAL EXCESS =    4.59

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      32.     12.08                     3.          1.          1.          1.
                        (INCHES)     3.764       4.591       4.591       4.591
                         (AC-FT)       1.          2.          2.          2.

                          CUMULATIVE AREA =     .01 SQ MI


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

HYDROGRAPH AT STATION OFF2
FOR PLAN 3, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
32.	12.08	3.	1.	1.	1.
		(INCHES) 3.764	4.591	4.591	4.591
		(AC-FT) 1.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

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

94 KP PLAN 4 FOR STATION OFF2 OFFSITE RUNOFF FROM WESTERN AREAS AND SO
25YEAR

SUBBASIN RUNOFF DATA

83 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

96 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
1.00	1.83	3.25	4.50	5.00	6.00	7.75	8.50	.00	.00	.00	.00

STORM AREA = .01

84 LS SCS LOSS RATE
STRTL .60 INITIAL ABSTRACTION
CRVNBR 77.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

85 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .02 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES

40.	11.	2.	0.	0.

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

HYDROGRAPH AT STATION OFF2
FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL = 8.50, TOTAL LOSS = 2.77, TOTAL EXCESS = 5.73

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
	(CFS)				
+ 37.	12.08	4.	1.	1.	1.
	(INCHES)	4.720	5.735	5.735	5.735
	(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

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

HYDROGRAPH AT STATION OFF2
FOR PLAN 4, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
	(CFS)				
+ 37.	12.08	4.	1.	1.	1.
	(INCHES)	4.720	5.735	5.735	5.735
	(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .01 SQ MI

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

97 KP PLAN 5 FOR STATION OFF2 OFFSITE RUNOFF FROM WESTERN AREAS AND SO
50YEAR

SUBBASIN RUNOFF DATA

83 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

99 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
1.08	1.97	3.50	5.00	5.25	7.00	8.90	10.10	.00	.00	.00	.00

STORM AREA = .01

```
   84 LS          SCS LOSS RATE
                       STRTL         .60  INITIAL ABSTRACTION
                      CRVNBR       77.00  CURVE NUMBER
                       RTIMP         .00  PERCENT IMPERVIOUS AREA

   85 UD          SCS DIMENSIONLESS UNITGRAPH
                         TLAG         .02  LAG

                                                                  ***

                                                              UNIT HYDROGRAPH
                                                           5 END-OF-PERIOD
ORDINATES
                 40.       11.        2.        0.        0.

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

                          HYDROGRAPH AT STATION     OFF2
                            FOR PLAN 5, RATIO = 1.00

     TOTAL RAINFALL =   10.10, TOTAL LOSS =    2.87, TOTAL EXCESS =    7.23

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      41.     12.08                  4.          1.          1.          1.
                         (INCHES)     5.638       7.230       7.230       7.230
                          (AC-FT)       2.          3.          3.          3.

                           CUMULATIVE AREA =     .01 SQ MI


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

                          HYDROGRAPH AT STATION     OFF2
                            FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      41.     12.08                  4.          1.          1.          1.
                         (INCHES)     5.638       7.230       7.230       7.230
                          (AC-FT)       2.          3.          3.          3.

                           CUMULATIVE AREA =     .01 SQ MI


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

  100 KP        PLAN  6 FOR STATION     OFF2          OFFSITE RUNOFF FROM WESTERN
AREAS AND SO
```

00YEAR

SUBBASIN RUNOFF DATA

83 BA SUBBASIN CHARACTERISTICS
TAREA .01 SUBBASIN AREA

PRECIPITATION DATA

102 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .....
..... TP-49 .....

5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
1.24	2.25	4.00	5.50	6.00	8.00	10.00	12.00	.00	.00	.00	.00

STORM AREA = .01

84 LS SCS LOSS RATE
STRTL .60 INITIAL ABSTRACTION
CRVNBR 77.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

85 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .02 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
40. 11. 2. 0. 0.

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

HYDROGRAPH AT STATION OFF2
FOR PLAN 6, RATIO = 1.00

TOTAL RAINFALL = 12.00, TOTAL LOSS = 2.96, TOTAL EXCESS = 9.04

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW (CFS) 6-HR	24-HR	72-HR	24.92-HR
49.	12.08	5.	2.	2.	2.
		(INCHES) 6.714	9.036	9.036	9.036
		(AC-FT) 2.	3.	3.	3.

CUMULATIVE AREA = .01 SQ MI

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

HYDROGRAPH AT STATION OFF2
FOR PLAN 6, RATIO = 1.00

```
  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+      49.     12.08                    5.          2.          2.           2.
                      (INCHES)     6.714       9.036       9.036        9.036
                       (AC-FT)       2.          3.          3.           3.

                       CUMULATIVE AREA =     .01 SQ MI


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


            **************
            *            *
  103 KK    *    ROUTIN  *     G THROUGH PROJECT SITE
            *            *
            **************

               HYDROGRAPH ROUTING DATA

  104 RM         MUSKINGUM ROUTING
                       NSTPS         1 NUMBER OF SUBREACHES
                       AMSKK       .31 MUSKINGUM K
                           X       .12 MUSKINGUM X

                                                                  ***

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

                         HYDROGRAPH AT STATION   ROUTIN
                           FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                        (CFS)
+       8.     12.25                    1.          0.          0.           0.
                      (INCHES)     1.828       2.210       2.210        2.210
                       (AC-FT)       1.          1.          1.           1.

                       CUMULATIVE AREA =     .01 SQ MI


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

               PLAN  2 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1
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       ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION   ROUTIN
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+      11.     12.25                2.          1.          1.           1.
                        (INCHES)    3.016       3.698       3.698        3.698
                         (AC-FT)      1.          1.          1.           1.

                         CUMULATIVE AREA =     .01 SQ MI


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

                PLAN  3 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                          HYDROGRAPH AT STATION   ROUTIN
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+      15.     12.25                3.          1.          1.           1.
                        (INCHES)    3.750       4.590       4.590        4.590
                         (AC-FT)      1.          2.          2.           2.

                         CUMULATIVE AREA =     .01 SQ MI


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

                PLAN  4 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                          HYDROGRAPH AT STATION   ROUTIN
                            FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                         (CFS)
+      17.     12.25                3.          1.          1.           1.
                        (INCHES)    4.712       5.734       5.734        5.734
```

```
                          (AC-FT)        2.          2.          2.          2.

                          CUMULATIVE AREA =     .01 SQ MI


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

                PLAN  5 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                            HYDROGRAPH AT STATION   ROUTIN
                              FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                           (CFS)
+      20.     12.25                4.          1.          1.          1.
                         (INCHES)     5.621       7.229       7.229       7.229
                          (AC-FT)        2.          3.          3.          3.

                          CUMULATIVE AREA =     .01 SQ MI


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

                PLAN  6 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                            HYDROGRAPH AT STATION   ROUTIN
                              FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                    6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                           (CFS)
+      24.     12.25                5.          2.          2.          2.
                         (INCHES)     6.703       9.034       9.034       9.034
                          (AC-FT)        2.          3.          3.          3.

                          CUMULATIVE AREA =     .01 SQ MI


 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
*** *** *** *** *** *** *** *** *** *** *** ***
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            **************
            *            *
  105 KK    *     COMB2  *     TOTAL OFFSITE AND SITE AREAS
            *            *
            **************

  106 HC          HYDROGRAPH COMBINATION
                        ICOMP           3  NUMBER OF HYDROGRAPHS TO COMBINE
                                                                    ***
       ***             ***             ***             ***             ***

                          HYDROGRAPH AT STATION    COMB2
                            FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      36.     12.33                    10.          3.          3.           3.
                       (INCHES)       .847       1.033       1.033        1.033
                        (AC-FT)         5.          6.          6.           6.

                         CUMULATIVE AREA =     .11 SQ MI

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

                          HYDROGRAPH AT STATION    COMB2
                            FOR PLAN 2, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      64.     12.33                    20.          6.          6.           6.
                       (INCHES)     1.650       2.032       2.032        2.032
                        (AC-FT)       10.         12.         12.          12.

                         CUMULATIVE AREA =     .11 SQ MI

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

                          HYDROGRAPH AT STATION    COMB2
                            FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                        6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      90.     12.33                    27.          8.          8.           8.
                       (INCHES)     2.217       2.686       2.686        2.686
                        (AC-FT)       13.         16.         16.          16.
```

CUMULATIVE AREA = .11 SQ MI

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

HYDROGRAPH AT STATION COMB2
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	115.	12.25		36.	11.	10.	10.
			(INCHES)	2.985	3.565	3.565	3.565
			(AC-FT)	18.	22.	22.	22.

CUMULATIVE AREA = .11 SQ MI

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

HYDROGRAPH AT STATION COMB2
FOR PLAN 5, RATIO = 1.00

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	144.	12.25		47.	15.	14.	14.
			(INCHES)	3.836	4.769	4.769	4.769
			(AC-FT)	23.	29.	29.	29.

CUMULATIVE AREA = .11 SQ MI

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

HYDROGRAPH AT STATION COMB2
FOR PLAN 6, RATIO = 1.00

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	185.	12.25		58.	19.	18.	18.
			(INCHES)	4.767	6.283	6.283	6.283
			(AC-FT)	29.	38.	38.	38.

CUMULATIVE AREA = .11 SQ MI

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

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            **************
            *            *
  107 KK    *    ROUTIN  *     G THROUGH PROJECT SITE POND
            *            *
            **************

               HYDROGRAPH ROUTING DATA

  108 RS          STORAGE ROUTING
                       NSTPS           1  NUMBER OF SUBREACHES
                        ITYP        ELEV  TYPE OF INITIAL CONDITION
                      RSVRIC        1.64  INITIAL CONDITION
                           X         .00 WORKING R AND D COEFFICIENT

  109 SA              AREA          .0        .0        .2        .7       4.9
     13.3      18.3

  110 SE          ELEVATION        1.64      3.28      4.92      5.74      6.56
     9.84     13.12

  111 SQ          DISCHARGE          0.        0.        2.        5.       35.
     94.      129.

                                                                  ***

                                                 COMPUTED STORAGE-ELEVATION
DATA

             STORAGE        .00       .00       .13       .49      2.54     31.20
     82.76
           ELEVATION       1.64      3.28      4.92      5.74      6.56      9.84
     13.12

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

                         HYDROGRAPH AT STATION   ROUTIN
                           FOR PLAN 1, RATIO = 1.00

  PEAK FLOW     TIME                              MAXIMUM AVERAGE FLOW
                                          6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                          (CFS)
+      20.     13.08         10.          3.          3.           3.
                       (INCHES)      .793       1.022       1.022        1.022
                        (AC-FT)        5.          6.          6.           6.

 PEAK STORAGE   TIME                            MAXIMUM AVERAGE STORAGE
                                          6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        2.     13.08           1.          0.          0.           0.

  PEAK STAGE    TIME                             MAXIMUM AVERAGE STAGE
                                          6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
      6.16     13.08         5.87        3.94        3.85         3.85
```

CUMULATIVE AREA = .11 SQ MI

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

PLAN 2 INPUT DATA FOR STATION ROUTIN ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION ROUTIN
FOR PLAN 2, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
35.	13.17	20.	6.	6.	6.
		(INCHES) 1.606	2.011	2.011	2.011
		(AC-FT) 10.	12.	12.	12.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
3.	13.17	2.	0.	0.	0.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
6.57	13.17	6.15	4.25	4.15	4.15

CUMULATIVE AREA = .11 SQ MI

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

PLAN 3 INPUT DATA FOR STATION ROUTIN ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION ROUTIN
FOR PLAN 3, RATIO = 1.00

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
38.	13.67	26.	8.	8.	8.
		(INCHES) 2.156	2.663	2.663	2.663
		(AC-FT) 13.	16.	16.	16.

PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE

```
                                                6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        4.     13.67                             2.          1.          1.           1.

  PEAK STAGE    TIME                                    MAXIMUM AVERAGE STAGE
                                                6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
      6.73     13.67                           6.36        4.40        4.30         4.30

                              CUMULATIVE AREA =     .11 SQ MI


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

                PLAN  4 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                            HYDROGRAPH AT STATION   ROUTIN
                              FOR PLAN 4, RATIO = 1.00

  PEAK FLOW     TIME                                    MAXIMUM AVERAGE FLOW
                                                6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                                 (CFS)
+      42.     13.75                            35.         11.         10.          10.
                               (INCHES)       2.870       3.540       3.540        3.540
                                (AC-FT)         17.         21.         21.          21.

 PEAK STORAGE   TIME                                    MAXIMUM AVERAGE STORAGE
                                                6-HR       24-HR       72-HR     24.92-HR
+  (AC-FT)      (HR)
        6.     13.75                             4.          1.          1.           1.

  PEAK STAGE    TIME                                    MAXIMUM AVERAGE STAGE
                                                6-HR       24-HR       72-HR     24.92-HR
+   (FEET)      (HR)
      6.98     13.75                           6.67        4.58        4.47         4.47

                              CUMULATIVE AREA =     .11 SQ MI


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

                PLAN  5 INPUT DATA FOR STATION   ROUTIN ARE SAME AS FOR PLAN
1

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

                            HYDROGRAPH AT STATION   ROUTIN
                              FOR PLAN 5, RATIO = 1.00
```

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 46.	14.17		42.	14.	14.	14.
		(INCHES)	3.471	4.724	4.724	4.724
		(AC-FT)	21.	29.	29.	29.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
8.	14.17		6.	2.	2.	2.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
7.22	14.17		7.00	4.92	4.80	4.80

CUMULATIVE AREA = .11 SQ MI

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

PLAN 6 INPUT DATA FOR STATION ROUTIN ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION ROUTIN
FOR PLAN 6, RATIO = 1.00

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 53.	14.50		48.	19.	18.	18.
		(INCHES)	3.959	6.213	6.213	6.213
		(AC-FT)	24.	38.	38.	38.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
11.	14.50		9.	3.	3.	3.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
7.57	14.50		7.33	5.34	5.20	5.20

CUMULATIVE AREA = .11 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES

TIME TO PEAK IN HOURS

RATIOS APPLIED TO FLOWS

OPERATION	STATION	AREA	PLAN		RATIO 1
					1.00
HYDROGRAPH AT					
+	OFF1	.04	1	FLOW	46.
				TIME	12.17
			2	FLOW	72.
				TIME	12.17
			3	FLOW	98.
				TIME	12.17
			4	FLOW	115.
				TIME	12.17
			5	FLOW	133.
				TIME	12.17
			6	FLOW	161.
				TIME	12.17
HYDROGRAPH AT					
+	DA-1	.02	1	FLOW	4.
				TIME	12.17
			2	FLOW	15.
				TIME	12.17
			3	FLOW	26.
				TIME	12.08
			4	FLOW	37.
				TIME	12.08
			5	FLOW	51.
				TIME	12.08
			6	FLOW	70.
				TIME	12.08
2 COMBINED AT					
+	COMB.1	.06	1	FLOW	51.
				TIME	12.17
			2	FLOW	87.
				TIME	12.17
			3	FLOW	124.
				TIME	12.17
			4	FLOW	150.
				TIME	12.17
			5	FLOW	179.
				TIME	12.17
			6	FLOW	223.
				TIME	12.17
ROUTED TO					
+	POND1	.06	1	FLOW	23.
				TIME	12.50
			2	FLOW	33.

```
                                          TIME        12.50
                                     3    FLOW          41.
                                          TIME        12.58
                                     4    FLOW          47.
                                          TIME        12.58
                                     5    FLOW          55.
                                          TIME        12.58
                                     6    FLOW          63.
                                          TIME        12.58

                                     ** PEAK STAGES IN FEET **
                                     1    STAGE       14.40
                                          TIME        12.50
                                     2    STAGE       16.06
                                          TIME        12.50
                                     3    STAGE       17.25
                                          TIME        12.58
                                     4    STAGE       18.14
                                          TIME        12.58
                                     5    STAGE       19.21
                                          TIME        12.58
                                     6    STAGE       20.44
                                          TIME        12.58

 HYDROGRAPH AT
+                  DA-2       .05     1    FLOW           7.
                                          TIME        12.33
                                     2    FLOW          24.
                                          TIME        12.25
                                     3    FLOW          41.
                                          TIME        12.25
                                     4    FLOW          58.
                                          TIME        12.25
                                     5    FLOW          78.
                                          TIME        12.25
                                     6    FLOW         107.
                                          TIME        12.25

 HYDROGRAPH AT
+                  OFF2       .01     1    FLOW          17.
                                          TIME        12.08
                                     2    FLOW          24.
                                          TIME        12.08
                                     3    FLOW          32.
                                          TIME        12.08
                                     4    FLOW          37.
                                          TIME        12.08
                                     5    FLOW          41.
                                          TIME        12.08
                                     6    FLOW          49.
                                          TIME        12.08

 ROUTED TO
+                ROUTIN       .01     1    FLOW           8.
                                          TIME        12.25
                                     2    FLOW          11.
                                          TIME        12.25
```

```
                                        3   FLOW          15.
                                            TIME        12.25
                                        4   FLOW          17.
                                            TIME        12.25
                                        5   FLOW          20.
                                            TIME        12.25
                                        6   FLOW          24.
                                            TIME        12.25

  3 COMBINED AT
+                   COMB2       .11     1   FLOW          36.
                                            TIME        12.33
                                        2   FLOW          64.
                                            TIME        12.33
                                        3   FLOW          90.
                                            TIME        12.33
                                        4   FLOW         115.
                                            TIME        12.25
                                        5   FLOW         144.
                                            TIME        12.25
                                        6   FLOW         185.
                                            TIME        12.25


 ROUTED TO
+                   ROUTIN      .11     1   FLOW          20.
                                            TIME        13.08
                                        2   FLOW          35.
                                            TIME        13.17
                                        3   FLOW          38.
                                            TIME        13.67
                                        4   FLOW          42.
                                            TIME        13.75
                                        5   FLOW          46.
                                            TIME        14.17
                                        6   FLOW          53.
                                            TIME        14.50

                                        ** PEAK STAGES IN FEET **
                                        1   STAGE        6.16
                                            TIME        13.08
                                        2   STAGE        6.57
                                            TIME        13.17
                                        3   STAGE        6.73
                                            TIME        13.67
                                        4   STAGE        6.98
                                            TIME        13.75
                                        5   STAGE        7.22
                                            TIME        14.17
                                        6   STAGE        7.57
                                            TIME        14.50


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

APPENDIX 2
HEC-RAS Model Computer Printout - Structure Under PR-466 Road

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: ROAD
Project File : ROADPIPE.prj
Run Date and Time: 7/9/2007 11:39:52 AM

Project in SI units

Project Description:
YCOMPUTATION OF FLOOD ELEVATION AT PR-866

PLAN DATA

Plan Title: Plan 02
Plan File : e:\GF\MHAU\ROADPIPE.p02

Geometry Title: ROAD2
Geometry File : e:\GF\MHAU\ROADPIPE.g02

Flow Title : PR-866
Flow File : e:\GF\MHAU\ROADPIPE.f01

Plan Summary Information:

Number of:	Cross Sections	= 4	Mulitple Openings	=	0
	Culverts	= 1	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

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

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

FLOW DATA

Flow Title: PR-866
Flow File : e:\GF\MHAU\ROADPIPE.f01

Flow Data (m3/s)

River	Reach	RS	PF 1	PF 2	PF 3	PF 4	PF 5	PF 6	PF 7
ROAD	FARALLON	107	.5	2	3	4	5	6	7

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
ROAD	FARALLON	PF 1	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 2	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 3	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 4	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 5	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 6	Normal S = 0.003	Normal S = 0.002
ROAD	FARALLON	PF 7	Normal S = 0.003	Normal S = 0.002

GEOMETRY DATA

Geometry Title: ROAD2
Geometry File : e:\GF\MHAU\ROADPIPE.g02

CROSS SECTION

RIVER: ROAD
REACH: FARALLON RS: 107

INPUT
Description: X-SECTION 3. PROJECT SOUTH PR 866
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7	75	7	215	6.5	245	4	265	3.5
310	3.5	330	4	355	6	405	6.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	405	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	405	50	50	.1	.3

CROSS SECTION

RIVER: ROAD
REACH: FARALLON RS: 57

INPUT
Description: X-SECTION 2. UPSTREAM PR 866
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7	75	7	215	6.5	245	4	265	3.5
310	3.5	330	4	355	6	405	6.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	405	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	405	7	7	.1	.3

CULVERT

RIVER: ROAD
REACH: FARALLON RS: 55

INPUT
Description:
Distance from Upstream XS = 1
Deck/Roadway Width = 5
Weir Coefficient = 1.44
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	7.5		285	6.5		405	7	

```
Upstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev

       0       7      75       7     215     6.5     245       4     265     3.5
     310     3.5     330       4     355       6     405     6.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06       0     .06     405     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
            0     405             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       3
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0     7.5             285     6.5             405       7

Downstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     6.5      75       6     215     4.5     245       4     265
3
     310       3     330       4     355       6     405       6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045      75    .045     355    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
            75     355             .1       .3

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

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular     .61
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall

Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length   Top n  Bottom n  Depth Blocked  Entrance Loss Coef
  Exit Loss Coef
                 1       5     .013     .013        0                  .25
           1
Upstream   Elevation =  3.5
           Centerline Station =  267
Downstream Elevation =  3.1
```

```
           Centerline Station =  267

CROSS SECTION


RIVER: ROAD
REACH: FARALLON           RS: 50.00

INPUT
Description: X-SECTION 1.0 JUST DOWNSTREAM 866
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0     6.5      75       6     215     4.5     245       4     265
3
     310       3     330       4     355       6     405       6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045      75    .045     355    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.   Expan.
            75     355               50      50      10             .1       .3

CROSS SECTION


RIVER: ROAD
REACH: FARALLON           RS: 0.0

INPUT
Description: X-SECTION 0.00 NEAR WETLAND
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0       7      55       7     110       4     210    2.25     235
2
     245       2     265     2.5     275       3     325       7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .045      55    .045     325    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right    Coeff Contr.   Expan.
            55     325                0       0       0             .1       .3



SUMMARY OF MANNING'S N VALUES

River:ROAD

      Reach          River Sta.       n1        n2        n3

 FARALLON             107                .06       .06       .06
 FARALLON             57                 .06       .06       .06

 FARALLON             55           Culvert
```

FARALLON	50.00	.045	.045	.045
FARALLON	0.0	.045	.045	.045

SUMMARY OF REACH LENGTHS

River: ROAD

Reach	River Sta.	Left	Channel	Right
FARALLON	107	50	50	50
FARALLON	57	7	7	7
FARALLON	55	Culvert		
FARALLON	50.00	50	50	10
FARALLON	0.0	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: ROAD

Reach	River Sta.	Contr.	Expan.
FARALLON	107	.1	.3
FARALLON	57	.1	.3
FARALLON	55	Culvert	
FARALLON	50.00	.1	.3
FARALLON	0.0	.1	.3

APPENDIX 3
HEC-1 Computer Model Printout - Proposed Conditions

```
1****************************************
****************************************
 *                          *                          *                          *
 *  FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                          *  U.S. ARMY CORPS OF ENGINEERS
   *
 *           JUN  1998           *                          *  HYDROLOGIC ENGINEERING CENTER   *
 *         VERSION 4.1           *                          *        609 SECOND STREET         *
 *                          *                          *     DAVIS, CALIFORNIA 95616      *
 *  RUN DATE   09JUL07  TIME  11:21:09  *                          *         (916) 756-1104          *
 *                          *                          *                          *
 ****************************************
****************************************
```

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,

DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION

KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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

        1         ID  PROPOSED CONDITIONS FILE:PROP1       REA TO THE SOUTH OF MUNICIPAL ROAD
        2         ID  HYDROLOGY CONDITIONS     SITE       VILLAS DEL MAR HAU
        3         ID  , 5, 10, 25, 50 AND 100 YEAR FREQUENCY FLOW
        4         ID              24 HOURS DURATION
                 *DIAGRAM
```

```
 5       IT     5     0     0    300
 6       IO     3
 7       JP     6

 8       KK    OFF1OFFSITE RUNOFF FROM SOUTH AREA
 9       KP     1
10       BA  0.0371
11       LS     0    73
12       UD  0.1518
13       KM  2 YEAR
14       PH     0     0  0.618  1.124   2.00   2.25   2.50    3.0    4.0   4.50
15       KP     2
16       KM  5 YEAR
17       PH     0     0 0.7416  1.349   2.40    3.0    3.5    4.5    5.5   6.25
18       KP     3
19       KM  10YEAR
20       PH     0     0  0.927  1.686    3.0   3.50   4.25   5.10   6.50   7.25
21       KP     4
22       KM  25YEAR
23       PH     0     0  1.004  1.826   3.25   4.50   5.00   6.00   7.75   8.50
24       KP     5
25       KM  50YEAR
26       PH     0     0   1.08  1.967   3.50   5.00   5.25   7.00   8.90  10.10
27       KP     6
28       KM  00YEAR
29       PH     0     0  1.236   2.25   4.00   5.50   6.00   8.00  10.00  12.00

30       KK    DA-1SOUTH AREA OF PROJECT
31       KP     1
32       BA  0.0226
33       LS     0    52
34       UD    0.05
35       KM  2 YEAR
36       PH     0     0  0.618  1.124   2.00   2.25   2.50    3.0    4.0   4.50
37       KP     2
38       KM  5 YEAR
39       PH     0     0 0.7416  1.349   2.40    3.0    3.5    4.5    5.5   6.25
40       KP     3
41       KM  10YEAR
42       PH     0     0  0.927  1.686    3.0   3.50   4.25   5.10   6.50   7.25
43       KP     4
44       KM  25YEAR
45       PH     0     0  1.004  1.826   3.25   4.50   5.00   6.00   7.75   8.50
46       KP     5
47       KM  50YEAR
48       PH     0     0   1.08  1.967   3.50   5.00   5.25   7.00   8.90  10.10
49       KP     6
```

```
         50        KM  00YEAR
         51        PH      0      0  1.236    2.25    4.00    5.50    6.00    8.00   10.00   12.00
1                                    HEC-1 INPUT                                    PAGE  2

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

         52        KK  COMB.1EXTERNA SOUTH (1) AND PROJECT SOUTH (DA1)
         53        HC       2

         54        KK   POND1(AREA STORAGE PROJECT SOUTH AREA)
         55        RS       1    ELEV   6.562
         56        SA     1.5     1.5     1.5     1.5     1.5     1.5
         57        SE   6.562    8.20   9.843  13.124   14.76 18.0455
         58        SQ   8.925   8.925   8.925   8.925   8.925   8.925
         59        ZZ
1
            SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING         (--->) DIVERSION OR PUMP FLOW

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

    8       OFF1
             .
             .
   30         .       DA-1
             .         .
             .         .
   52      COMB.1.....
             V
             V
   54       POND1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1****************************************
****************************************
 *                          *                          *                          *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                          *    U.S. ARMY CORPS OF
ENGINEERS     *
 *            JUN   1998            *                          *    HYDROLOGIC ENGINEERING CENTER    *
 *          VERSION 4.1             *                          *         609 SECOND STREET          *
 *                                  *                          *      DAVIS, CALIFORNIA 95616       *
 *  RUN DATE   09JUL07  TIME  11:21:09   *                          *          (916) 756-1104          *
 *                          *                          *                          *
 ****************************************
****************************************
```

```
                 PROPOSED CONDITIONS FILE:PROP1        REA TO THE SOUTH OF MUNICIPAL ROAD

                 HYDROLOGY CONDITIONS     SITE       VILLAS DEL MAR HAU
                 , 5, 10, 25, 50 AND 100 YEAR FREQUENCY FLOW
                        24 HOURS DURATION

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

  IT        HYDROGRAPH TIME DATA
               NMIN           5  MINUTES IN COMPUTATION INTERVAL
               IDATE      1    0  STARTING DATE
               ITIME        0000  STARTING TIME
                 NQ         300  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      2    0  ENDING DATE
              NDTIME        0055  ENDING TIME
              ICENT          19  CENTURY MARK

            COMPUTATION INTERVAL     .08 HOURS
               TOTAL TIME BASE   24.92 HOURS

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

  JP        MULTI-PLAN OPTION
               NPLAN          6  NUMBER OF PLANS

  JR        MULTI-RATIO OPTION
             RATIOS OF RUNOFF
             1.00
```

*** ***

```
      **************
      *            *
 8 KK *     OFF1   *     OFFSITE RUNOFF FROM SOUTH AREA
      *            *
      **************


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

 9 KP      PLAN  1 FOR STATION     OFF1         OFFSITE RUNOFF FROM SOUTH AREA

                2 YEAR

          SUBBASIN RUNOFF DATA

 10 BA        SUBBASIN CHARACTERISTICS
               TAREA        .04  SUBBASIN AREA

           PRECIPITATION DATA

 14 PH                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 .....   ..............  TP-40 ..............   ...........  TP-49 ...........
           5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
            .62    1.12    2.00    2.25    2.50    3.00    4.00    4.50     .00     .00     .00     .00

                                    STORM AREA =     .04

 11 LS        SCS LOSS RATE
               STRTL        .74  INITIAL ABSTRACTION
              CRVNBR       73.00  CURVE NUMBER
               RTIMP        .00  PERCENT IMPERVIOUS AREA

 12 UD        SCS DIMENSIONLESS UNITGRAPH
               TLAG        .15  LAG

                                        ***

                                    UNIT HYDROGRAPH
                                  11 END-OF-PERIOD ORDINATES
           34.      90.      81.      41.      21.      10.       5.       3.       1.       1.
            0.

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

                HYDROGRAPH AT STATION     OFF1
```

FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 4.50, TOTAL LOSS = 2.60, TOTAL EXCESS = 1.90

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	46.	12.17	6.	2.	2.	2.
		(INCHES)	1.591	1.896	1.896	1.896
		(AC-FT)	3.	4.	4.	4.

CUMULATIVE AREA = .04 SQ MI

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 1, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	46.	12.17	6.	2.	2.	2.
		(INCHES)	1.591	1.896	1.896	1.896
		(AC-FT)	3.	4.	4.	4.

CUMULATIVE AREA = .04 SQ MI

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

15 KP PLAN 2 FOR STATION OFF1 OFFSITE RUNOFF FROM SOUTH AREA

5 YEAR

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

17 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....

5-MIN 15-MIN 60-MIN 2-HR 3-HR 6-HR 12-HR 24-HR 2-DAY 4-DAY 7-DAY 10-DAY
.74 1.35 2.40 3.00 3.50 4.50 5.50 6.25 .00 .00 .00 .00

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
34. 90. 81. 41. 21. 10. 5. 3. 1. 1.
0.

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 2, RATIO = 1.00

TOTAL RAINFALL = 6.25, TOTAL LOSS = 2.95, TOTAL EXCESS = 3.30

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)
+ 72. 12.17 11. 3. 3. 3.
(INCHES) 2.711 3.297 3.297 3.297
(AC-FT) 5. 7. 7. 7.

CUMULATIVE AREA = .04 SQ MI

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 2, RATIO = 1.00

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)

```
+     72.    12.17              11.        3.        3.        3.
                (INCHES)    2.711     3.297     3.297     3.297
                (AC-FT)      5.        7.        7.        7.

                CUMULATIVE AREA =     .04 SQ MI


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

  18 KP       PLAN  3 FOR STATION     OFF1        OFFSITE RUNOFF FROM SOUTH AREA

                  10YEAR

            SUBBASIN RUNOFF DATA

  10 BA        SUBBASIN CHARACTERISTICS
                TAREA       .04  SUBBASIN AREA

             PRECIPITATION DATA

  20 PH                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 .....  ..............  TP-40 ..............  ..........  TP-49 ..........
            5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR  24-HR  2-DAY  4-DAY  7-DAY  10-DAY
             .93    1.69    3.00    3.50   4.25   5.10   6.50   7.25    .00    .00    .00    .00

                                    STORM AREA =     .04

  11 LS        SCS LOSS RATE
                STRTL       .74  INITIAL ABSTRACTION
               CRVNBR       73.00  CURVE NUMBER
                RTIMP       .00  PERCENT IMPERVIOUS AREA

  12 UD        SCS DIMENSIONLESS UNITGRAPH
                TLAG        .15  LAG

                                        ***

                                    UNIT HYDROGRAPH
                                  11 END-OF-PERIOD ORDINATES
             34.      90.      81.      41.      21.      10.       5.       3.       1.       1.
              0.

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

                 HYDROGRAPH AT STATION     OFF1
                  FOR PLAN 3, RATIO = 1.00
```

```
    TOTAL RAINFALL =    7.25, TOTAL LOSS =    3.10, TOTAL EXCESS =    4.15

  PEAK FLOW     TIME                  MAXIMUM AVERAGE FLOW
                            6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+      98.     12.17                14.         4.          4.          4.
                 (INCHES)     3.427       4.151       4.151       4.151
                  (AC-FT)       7.          8.          8.          8.

                  CUMULATIVE AREA =     .04 SQ MI


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

                  HYDROGRAPH AT STATION     OFF1
                   FOR PLAN 3, RATIO = 1.00

  PEAK FLOW     TIME                  MAXIMUM AVERAGE FLOW
                            6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+      98.     12.17                14.         4.          4.          4.
                 (INCHES)     3.427       4.151       4.151       4.151
                  (AC-FT)       7.          8.          8.          8.

                  CUMULATIVE AREA =     .04 SQ MI


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

  21 KP       PLAN  4 FOR STATION     OFF1         OFFSITE RUNOFF FROM SOUTH AREA

                  25YEAR

            SUBBASIN RUNOFF DATA

  10 BA         SUBBASIN CHARACTERISTICS
                  TAREA        .04  SUBBASIN AREA

             PRECIPITATION DATA

  23 PH                          DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ..............  TP-40 ..............   ..........  TP-49 ..........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
```

1.00 1.83 3.25 4.50 5.00 6.00 7.75 8.50 .00 .00 .00 .00

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
34. 90. 81. 41. 21. 10. 5. 3. 1. 1.
0.

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL = 8.50, TOTAL LOSS = 3.24, TOTAL EXCESS = 5.26

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	115.	12.17	17.	5.	5.	5.
			(INCHES)	4.377	5.255	5.255	5.255
			(AC-FT)	9.	10.	10.	10.

CUMULATIVE AREA = .04 SQ MI

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	115.	12.17	17.	5.	5.	5.

(INCHES) 4.377 5.255 5.255 5.255
(AC-FT) 9. 10. 10. 10.

CUMULATIVE AREA = .04 SQ MI

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

24 KP PLAN 5 FOR STATION OFF1 OFFSITE RUNOFF FROM SOUTH AREA

50YEAR

SUBBASIN RUNOFF DATA

10 BA SUBBASIN CHARACTERISTICS
TAREA .04 SUBBASIN AREA

PRECIPITATION DATA

26 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....
5-MIN 15-MIN 60-MIN 2-HR 3-HR 6-HR 12-HR 24-HR 2-DAY 4-DAY 7-DAY 10-DAY
1.08 1.97 3.50 5.00 5.25 7.00 8.90 10.10 .00 .00 .00 .00

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
34. 90. 81. 41. 21. 10. 5. 3. 1. 1.
0.

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 5, RATIO = 1.00

```
    TOTAL RAINFALL =   10.10, TOTAL LOSS =    3.39, TOTAL EXCESS =    6.71

  PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                            6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+     133.     12.17                21.         7.         6.         6.
                (INCHES)     5.303       6.709       6.709       6.709
                (AC-FT)      10.         13.         13.         13.

                CUMULATIVE AREA =     .04 SQ MI


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

                HYDROGRAPH AT STATION     OFF1
                 FOR PLAN 5, RATIO = 1.00

  PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                            6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+     133.     12.17                21.         7.         6.         6.
                (INCHES)     5.303       6.709       6.709       6.709
                (AC-FT)      10.         13.         13.         13.

                CUMULATIVE AREA =     .04 SQ MI


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

  27 KP       PLAN  6 FOR STATION     OFF1         OFFSITE RUNOFF FROM SOUTH AREA

                  00YEAR

            SUBBASIN RUNOFF DATA

  10 BA         SUBBASIN CHARACTERISTICS
                TAREA        .04  SUBBASIN AREA

             PRECIPITATION DATA

  29 PH                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
             ..... HYDRO-35 .....   ..............  TP-40 .............   ..........  TP-49 ..........
             5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              1.24    2.25    4.00    5.50    6.00    8.00   10.00   12.00     .00     .00     .00     .00
```

STORM AREA = .04

11 LS SCS LOSS RATE
STRTL .74 INITIAL ABSTRACTION
CRVNBR 73.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

12 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .15 LAG

***

UNIT HYDROGRAPH
11 END-OF-PERIOD ORDINATES
34. 90. 81. 41. 21. 10. 5. 3. 1. 1.
0.

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 6, RATIO = 1.00

TOTAL RAINFALL = 12.00, TOTAL LOSS = 3.52, TOTAL EXCESS = 8.48

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	161.	12.17	25.	8.	8.	8.
		(INCHES)	6.348	8.476	8.476	8.476
		(AC-FT)	13.	17.	17.	17.

CUMULATIVE AREA = .04 SQ MI

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

HYDROGRAPH AT STATION OFF1
FOR PLAN 6, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	161.	12.17	25.	8.	8.	8.
		(INCHES)	6.348	8.476	8.476	8.476

```
                    (AC-FT)      13.        17.        17.        17.

                    CUMULATIVE AREA =     .04 SQ MI



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


         **************
         *          *
  30 KK    *     DA-1  *     SOUTH AREA OF PROJECT
         *          *
         **************


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

  31 KP       PLAN  1 FOR STATION     DA-1         SOUTH AREA OF PROJECT
                  2 YEAR

          SUBBASIN RUNOFF DATA

  32 BA         SUBBASIN CHARACTERISTICS
                 TAREA        .02  SUBBASIN AREA

           PRECIPITATION DATA

  36 PH                         DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
           ..... HYDRO-35 ......   ............... TP-40 ...............   ........... TP-49 ...........
           5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
             .62    1.12    2.00    2.25    2.50    3.00    4.00    4.50     .00     .00     .00     .00

                              STORM AREA =     .02

  33 LS         SCS LOSS RATE
                 STRTL       1.85  INITIAL ABSTRACTION
                CRVNBR       52.00  CURVE NUMBER
                 RTIMP        .00  PERCENT IMPERVIOUS AREA

  34 UD         SCS DIMENSIONLESS UNITGRAPH
                  TLAG        .05  LAG

                                        ***
```

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
117. 45. 10. 2. 1.

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 1, RATIO = 1.00

TOTAL RAINFALL = 4.50, TOTAL LOSS = 3.91, TOTAL EXCESS = .59

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	7.	12.08	1.	0.	0.	0.
		(INCHES)	.491	.593	.593	.593
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 1, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	7.	12.08	1.	0.	0.	0.
		(INCHES)	.491	.593	.593	.593
		(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .02 SQ MI

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

37 KP PLAN 2 FOR STATION DA-1 SOUTH AREA OF PROJECT
5 YEAR

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS

```
              TAREA       .02  SUBBASIN AREA

          PRECIPITATION DATA

  39 PH                       DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
          ..... HYDRO-35 .....  ..............  TP-40 ..............  ..........  TP-49 ..........
          5-MIN  15-MIN  60-MIN   2-HR   3-HR   6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
           .74    1.35    2.40   3.00   3.50   4.50   5.50    6.25    .00     .00     .00    .00

                                  STORM AREA =     .02

  33 LS       SCS LOSS RATE
               STRTL       1.85  INITIAL ABSTRACTION
              CRVNBR      52.00  CURVE NUMBER
               RTIMP       .00  PERCENT IMPERVIOUS AREA

  34 UD       SCS DIMENSIONLESS UNITGRAPH
               TLAG        .05  LAG
                                    ***

                                  UNIT HYDROGRAPH
                                5 END-OF-PERIOD ORDINATES
          117.      45.      10.       2.       1.

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

                  HYDROGRAPH AT STATION     DA-1
                   FOR PLAN 2, RATIO = 1.00

    TOTAL RAINFALL =    6.25, TOTAL LOSS =    4.83, TOTAL EXCESS =    1.42

  PEAK FLOW     TIME                  MAXIMUM AVERAGE FLOW
                             6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+      24.     12.08               3.         1.         1.         1.
                (INCHES)     1.194      1.422      1.422      1.422
                (AC-FT)        1.         2.         2.         2.

                CUMULATIVE AREA =     .02 SQ MI


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

                  HYDROGRAPH AT STATION     DA-1
                   FOR PLAN 2, RATIO = 1.00
```

```
  PEAK FLOW     TIME                    MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.92-HR
+   (CFS)       (HR)
                  (CFS)
+      24.     12.08                3.         1.         1.         1.
                 (INCHES)     1.194      1.422      1.422      1.422
                  (AC-FT)       1.         2.         2.         2.

                  CUMULATIVE AREA =     .02 SQ MI


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

  40 KP       PLAN  3 FOR STATION     DA-1          SOUTH AREA OF PROJECT
                 10YEAR

           SUBBASIN RUNOFF DATA

  32 BA         SUBBASIN CHARACTERISTICS
                 TAREA        .02  SUBBASIN AREA

            PRECIPITATION DATA
  42 PH                        DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
            ..... HYDRO-35 .....   ..............  TP-40 ..............   ........... TP-49 ...........
            5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
              .93    1.69    3.00    3.50    4.25    5.10    6.50    7.25     .00     .00     .00     .00

                                      STORM AREA =     .02

  33 LS         SCS LOSS RATE
                 STRTL       1.85  INITIAL ABSTRACTION
                CRVNBR       52.00  CURVE NUMBER
                 RTIMP        .00  PERCENT IMPERVIOUS AREA

  34 UD         SCS DIMENSIONLESS UNITGRAPH
                 TLAG        .05  LAG

                                          ***

                                       UNIT HYDROGRAPH
                                     5 END-OF-PERIOD ORDINATES
             117.       45.       10.       2.        1.

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

                  HYDROGRAPH AT STATION     DA-1
```

FOR PLAN 3, RATIO = 1.00

TOTAL RAINFALL = 7.25, TOTAL LOSS = 5.25, TOTAL EXCESS = 2.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	39.	12.08	4.	1.	1.	1.
		(INCHES)	1.712	1.995	1.995	1.995
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .02 SQ MI

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 3, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	39.	12.08	4.	1.	1.	1.
		(INCHES)	1.712	1.995	1.995	1.995
		(AC-FT)	2.	2.	2.	2.

CUMULATIVE AREA = .02 SQ MI

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

43 KP PLAN 4 FOR STATION DA-1 SOUTH AREA OF PROJECT
25YEAR

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS
TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

45 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....
5-MIN 15-MIN 60-MIN 2-HR 3-HR 6-HR 12-HR 24-HR 2-DAY 4-DAY 7-DAY 10-DAY

1.00 1.83 3.25 4.50 5.00 6.00 7.75 8.50 .00 .00 .00 .00

STORM AREA = .02

33 LS SCS LOSS RATE
STRTL 1.85 INITIAL ABSTRACTION
CRVNBR 52.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .05 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
117. 45. 10. 2. 1.

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 4, RATIO = 1.00

TOTAL RAINFALL = 8.50, TOTAL LOSS = 5.71, TOTAL EXCESS = 2.79

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)
+ 53. 12.08 6. 2. 2. 2.
(INCHES) 2.406 2.787 2.787 2.787
(AC-FT) 3. 3. 3. 3.

CUMULATIVE AREA = .02 SQ MI

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 4, RATIO = 1.00

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)
+ 53. 12.08 6. 2. 2. 2.
(INCHES) 2.406 2.787 2.787 2.787

(AC-FT) 3. 3. 3. 3.

CUMULATIVE AREA = .02 SQ MI

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

46 KP PLAN 5 FOR STATION DA-1 SOUTH AREA OF PROJECT
50YEAR

SUBBASIN RUNOFF DATA

32 BA SUBBASIN CHARACTERISTICS
TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

48 PH DEPTHS FOR 0-PERCENT HYPOTHETICAL STORM
..... HYDRO-35 .... TP-40 .... TP-49 .....
5-MIN 15-MIN 60-MIN 2-HR 3-HR 6-HR 12-HR 24-HR 2-DAY 4-DAY 7-DAY 10-DAY
1.08 1.97 3.50 5.00 5.25 7.00 8.90 10.10 .00 .00 .00 .00

STORM AREA = .02

33 LS SCS LOSS RATE
STRTL 1.85 INITIAL ABSTRACTION
CRVNBR 52.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .05 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
117. 45. 10. 2. 1.
*** *** *** *** ***

HYDROGRAPH AT STATION DA-1
FOR PLAN 5, RATIO = 1.00

TOTAL RAINFALL = 10.10, TOTAL LOSS = 6.20, TOTAL EXCESS = 3.90

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR

```
+  (CFS)      (HR)
                 (CFS)
+     69.    12.08              8.        2.        2.        2.
             (INCHES)    3.229     3.896     3.896     3.896
              (AC-FT)     4.        5.        5.        5.

              CUMULATIVE AREA =     .02 SQ MI


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

              HYDROGRAPH AT STATION     DA-1
               FOR PLAN 5, RATIO = 1.00

 PEAK FLOW     TIME                  MAXIMUM AVERAGE FLOW
                      6-HR       24-HR       72-HR     24.92-HR
+  (CFS)      (HR)
                 (CFS)
+     69.    12.08              8.        2.        2.        2.
             (INCHES)    3.229     3.896     3.896     3.896
              (AC-FT)     4.        5.        5.        5.

              CUMULATIVE AREA =     .02 SQ MI


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

 49 KP       PLAN  6 FOR STATION     DA-1         SOUTH AREA OF PROJECT
                00YEAR

          SUBBASIN RUNOFF DATA

 32 BA        SUBBASIN CHARACTERISTICS
              TAREA        .02  SUBBASIN AREA

          PRECIPITATION DATA

 51 PH                     DEPTHS FOR   0-PERCENT HYPOTHETICAL STORM
          ..... HYDRO-35 .....   ..............  TP-40 ..............  ..........  TP-49 ..........
          5-MIN  15-MIN  60-MIN    2-HR    3-HR    6-HR   12-HR   24-HR   2-DAY   4-DAY   7-DAY  10-DAY
           1.24    2.25    4.00    5.50    6.00    8.00   10.00   12.00     .00     .00     .00     .00

                                 STORM AREA =     .02

 33 LS        SCS LOSS RATE
              STRTL       1.85  INITIAL ABSTRACTION
```

CRVNBR 52.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

34 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .05 LAG

***

UNIT HYDROGRAPH
5 END-OF-PERIOD ORDINATES
117. 45. 10. 2. 1.

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 6, RATIO = 1.00

TOTAL RAINFALL = 12.00, TOTAL LOSS = 6.68, TOTAL EXCESS = 5.32

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	92.	12.08	10.	3.	3.	3.
		(INCHES)	4.157	5.318	5.318	5.318
		(AC-FT)	5.	6.	6.	6.

CUMULATIVE AREA = .02 SQ MI

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

HYDROGRAPH AT STATION DA-1
FOR PLAN 6, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
		(CFS)				
+	92.	12.08	10.	3.	3.	3.
		(INCHES)	4.157	5.318	5.318	5.318
		(AC-FT)	5.	6.	6.	6.

CUMULATIVE AREA = .02 SQ MI

*** ***

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          **************
          *            *
  52 KK   *   COMB.1   *    EXTERNA SOUTH (1) AND PROJECT SOUTH (DA1)
          *            *
          **************

  53 HC         HYDROGRAPH COMBINATION
                 ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                               ***

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

                  HYDROGRAPH AT STATION   COMB.1
                    FOR PLAN 1, RATIO = 1.00

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.92-HR
+  (CFS)      (HR)
                  (CFS)
+      53.    12.17              8.          2.          2.          2.
                 (INCHES)    1.169      1.402      1.402       1.402
                  (AC-FT)       4.          4.          4.          4.

                  CUMULATIVE AREA =     .06 SQ MI


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

                  HYDROGRAPH AT STATION   COMB.1
                    FOR PLAN 2, RATIO = 1.00

 PEAK FLOW     TIME                      MAXIMUM AVERAGE FLOW
                              6-HR       24-HR       72-HR     24.92-HR
+  (CFS)      (HR)
                  (CFS)
+      90.    12.17             14.          4.          4.          4.
                 (INCHES)    2.117      2.587      2.587       2.587
                  (AC-FT)       7.          8.          8.          8.

                  CUMULATIVE AREA =     .06 SQ MI
```

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 3, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	126.	12.17	18.	5.	5.	5.
		(INCHES)	2.750	3.335	3.335	3.335
		(AC-FT)	9.	11.	11.	11.

CUMULATIVE AREA = .06 SQ MI

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	152.	12.17	23.	7.	7.	7.
		(INCHES)	3.621	4.321	4.321	4.321
		(AC-FT)	12.	14.	14.	14.

CUMULATIVE AREA = .06 SQ MI

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

HYDROGRAPH AT STATION COMB.1
FOR PLAN 5, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	180.	12.17	29.	9.	9.	9.
		(INCHES)	4.517	5.644	5.644	5.644
		(AC-FT)	14.	18.	18.	18.

CUMULATIVE AREA = .06 SQ MI

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

                    HYDROGRAPH AT STATION   COMB.1
                      FOR PLAN 6, RATIO = 1.00

  PEAK FLOW     TIME                     MAXIMUM AVERAGE FLOW
                            6-HR       24-HR       72-HR     24.92-HR
+   (CFS)      (HR)
                      (CFS)
+     222.     12.17              35.        12.        11.        11.
                   (INCHES)    5.478     7.280     7.280      7.280
                    (AC-FT)      17.        23.        23.        23.

                    CUMULATIVE AREA =     .06 SQ MI



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


          **************
          *           *
  54 KK     *     POND1  *     (AREA STORAGE PROJECT SOUTH AREA)
          *           *
          **************

             HYDROGRAPH ROUTING DATA

  55 RS         STORAGE ROUTING
                 NSTPS          1  NUMBER OF SUBREACHES
                  ITYP       ELEV  TYPE OF INITIAL CONDITION
                RSVRIC       6.56  INITIAL CONDITION
                     X        .00 WORKING R AND D COEFFICIENT

  56 SA            AREA        1.5       1.5       1.5       1.5       1.5       1.5

  57 SE        ELEVATION       6.56      8.20      9.84     13.12     14.76     18.05

  58 SQ        DISCHARGE         9.        9.        9.        9.        9.        9.

                                                ***

                                  COMPUTED STORAGE-ELEVATION DATA
```

STORAGE .00 2.46 4.92 9.84 12.30 17.23
ELEVATION 6.56 8.20 9.84 13.12 14.76 18.05

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

HYDROGRAPH AT STATION POND1
FOR PLAN 1, RATIO = 1.00

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)
+ 9. .00 9. 9. 9. 9.
(INCHES) 1.390 5.560 5.772 5.772
(AC-FT) 4. 18. 18. 18.
PEAK STORAGE TIME MAXIMUM AVERAGE STORAGE
6-HR 24-HR 72-HR 24.92-HR
+ (AC-FT) (HR)
1. 12.75 1. 0. 0. 0.

PEAK STAGE TIME MAXIMUM AVERAGE STAGE
6-HR 24-HR 72-HR 24.92-HR
+ (FEET) (HR)
7.46 12.75 6.91 6.65 6.64 6.64

CUMULATIVE AREA = .06 SQ MI

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

PLAN 2 INPUT DATA FOR STATION POND1 ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION POND1
FOR PLAN 2, RATIO = 1.00

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
6-HR 24-HR 72-HR 24.92-HR
+ (CFS) (HR)
(CFS)
+ 9. .00 9. 9. 9. 9.
(INCHES) 1.390 5.560 5.772 5.772
(AC-FT) 4. 18. 18. 18.

```
 PEAK STORAGE   TIME                  MAXIMUM AVERAGE STORAGE
                          6-HR      24-HR      72-HR     24.92-HR
+ (AC-FT)     (HR)
      3.     14.17               3.         1.         1.         1.

 PEAK STAGE    TIME                  MAXIMUM AVERAGE STAGE
                          6-HR      24-HR      72-HR     24.92-HR
+  (FEET)     (HR)
    8.68     14.25               8.41       7.12       7.10       7.10

                  CUMULATIVE AREA =     .06 SQ MI


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

          PLAN  3 INPUT DATA FOR STATION    POND1 ARE SAME AS FOR PLAN  1

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

                  HYDROGRAPH AT STATION    POND1
                   FOR PLAN 3, RATIO = 1.00

 PEAK FLOW     TIME                  MAXIMUM AVERAGE FLOW
                          6-HR      24-HR      72-HR     24.92-HR
+  (CFS)      (HR)
                    (CFS)
+       9.      .00               9.         9.         9.         9.
                  (INCHES)     1.390      5.560      5.772      5.772
                   (AC-FT)       4.         18.        18.        18.

 PEAK STORAGE   TIME                  MAXIMUM AVERAGE STORAGE
                          6-HR      24-HR      72-HR     24.92-HR
+ (AC-FT)     (HR)
      5.     14.00               5.         2.         2.         2.

 PEAK STAGE    TIME                  MAXIMUM AVERAGE STAGE
                          6-HR      24-HR      72-HR     24.92-HR
+  (FEET)     (HR)
    9.79     14.00               9.57       7.72       7.68       7.68

                  CUMULATIVE AREA =     .06 SQ MI


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

PLAN 4 INPUT DATA FOR STATION POND1 ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION POND1
FOR PLAN 4, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	9.	.00	9.	9.	9.	9.
		(INCHES)	1.390	5.560	5.772	5.772
		(AC-FT)	4.	18.	18.	18.

	PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+	(AC-FT)	(HR)				
	7.	16.33	7.	3.	3.	3.

	PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+	(FEET)	(HR)				
	11.29	16.42	11.20	8.64	8.57	8.57

CUMULATIVE AREA = .06 SQ MI

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

PLAN 5 INPUT DATA FOR STATION POND1 ARE SAME AS FOR PLAN 1

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

HYDROGRAPH AT STATION POND1
FOR PLAN 5, RATIO = 1.00

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)				
			(CFS)			
+	9.	.00	9.	9.	9.	9.
		(INCHES)	1.390	5.560	5.772	5.772
		(AC-FT)	4.	18.	18.	18.

	PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR

```
+ (AC-FT)     (HR)
     10.    17.33              10.        5.        4.        4.

 PEAK STAGE   TIME                    MAXIMUM AVERAGE STAGE
                          6-HR      24-HR      72-HR    24.92-HR
+ (FEET)     (HR)
   13.18    17.42             13.00      9.66      9.55      9.55

                CUMULATIVE AREA =    .06 SQ MI


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

          PLAN  6 INPUT DATA FOR STATION   POND1 ARE SAME AS FOR PLAN  1

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

                HYDROGRAPH AT STATION   POND1
                 FOR PLAN 6, RATIO = 1.00

 PEAK FLOW    TIME                    MAXIMUM AVERAGE FLOW
                          6-HR      24-HR      72-HR    24.92-HR
+ (CFS)      (HR)
                (CFS)
+      9.     .00              9.        9.        9.        9.
              (INCHES)    1.390     5.560     5.772     5.772
              (AC-FT)       4.        18.       18.       18.

 PEAK STORAGE  TIME                    MAXIMUM AVERAGE STORAGE
                          6-HR      24-HR      72-HR    24.92-HR
+ (AC-FT)     (HR)
     13.    18.00              13.        7.        6.        6.

 PEAK STAGE   TIME                    MAXIMUM AVERAGE STAGE
                          6-HR      24-HR      72-HR    24.92-HR
+ (FEET)     (HR)
   15.37    18.00             15.22      10.90     10.74     10.74

                CUMULATIVE AREA =    .06 SQ MI

1

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

RATIOS APPLIED TO FLOWS

OPERATION	STATION	AREA	PLAN	RATIO 1
				1.00

HYDROGRAPH AT						
+	OFF1	.04	1	FLOW		46.
				TIME		12.17
			2	FLOW		72.
				TIME		12.17
			3	FLOW		98.
				TIME		12.17
			4	FLOW		115.
				TIME		12.17
			5	FLOW		133.
				TIME		12.17
			6	FLOW		161.
				TIME		12.17
HYDROGRAPH AT						
+	DA-1	.02	1	FLOW		7.
				TIME		12.08
			2	FLOW		24.
				TIME		12.08
			3	FLOW		39.
				TIME		12.08
			4	FLOW		53.
				TIME		12.08
			5	FLOW		69.
				TIME		12.08
			6	FLOW		92.
				TIME		12.08
2 COMBINED AT						
+	COMB.1	.06	1	FLOW		53.
				TIME		12.17
			2	FLOW		90.
				TIME		12.17
			3	FLOW		126.
				TIME		12.17
			4	FLOW		152.
				TIME		12.17
			5	FLOW		180.
				TIME		12.17
			6	FLOW		222.
				TIME		12.17

```
 ROUTED TO
+              POND1      .06     1   FLOW          9.
                                      TIME         .00
                                    2   FLOW          9.
                                      TIME         .00
                                    3   FLOW          9.
                                      TIME         .00
                                    4   FLOW          9.
                                      TIME         .00
                                    5   FLOW          9.
                                      TIME         .00
                                    6   FLOW          9.
                                      TIME         .00

                                    ** PEAK STAGES IN FEET **
                                    1   STAGE        7.46
                                      TIME        12.75
                                    2   STAGE        8.68
                                      TIME        14.25
                                    3   STAGE        9.79
                                      TIME        14.00
                                    4   STAGE       11.29
                                      TIME        16.42
                                    5   STAGE       13.18
                                      TIME        17.42
                                    6   STAGE       15.37
                                      TIME        18.00


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