Master Development Drainage Plan Update
Fairlane Technological Park

Colorado Springs, Colorado

Prepared For:

Bethesda Management
PO Box 63200
Colorado Springs, CO 80962-3200

Prepared By:

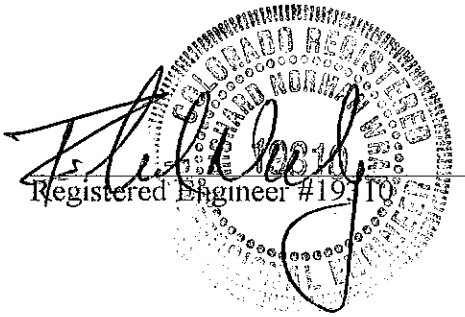
Kiowa Engineering Corporation
2814 International Circle
Colorado Springs, Colorado 80910

November 27, 2000
Revised February 8, 2001
Project No. 00084

ENGINEER'S STATEMENT:

The attached drainage plan and report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors and omissions on my part in preparing this report.

Kiowa Engineering Corporation, 2814 International Circle, Colorado Springs, CO 80910



Registered Engineer #19110 Date 3/1/01

OWNER'S STATEMENT:

The Owner and/or his representative has read and will comply with all of the requirements specified in this drainage report and plan.

BY: _____ 3-05-01
Operations Manager Date

ADDRESS:

New InterQuest 1, llc

15475 Gleneagle Drive

Colorado Springs, CO 80921

CITY OF COLORADO SPRINGS

Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

_____ 3/16/01

City Engineer Dated

The Final design of the Detention Pond will be in compliance with the policy adopted by the City on, January 16, 2001, which is in regards to development occurring upstream of the Air Force Academy.

3/16/01

PROJECT DESCRIPTION

The Fairlane Technological Park is a phased office campus and light industrial development located in northeast Colorado Springs. The majority of the development is mostly located on the land that lies east and west of Stage Highway 83, between Old Ranch Road and Interquest Parkway. The development lies between the Black Squirrel and Kettle Creek basins. The watershed has been note as the Elkhorn Basin in past drainage basin planning studies. The development has been and will continue to be constructed in phases. Five platted subdivisions exist within the Park. Interquest Subdivision Filing Nos. 1, 2 and 3 are in the planning stages. The total acreage subject to master planning covers approximately 664 acres.

The property subject to development is located in portions of Sections 15, 16, 20, 21, 28 and 29 of Township 12 South, Range 66 West of the 6th Principal Meridian. The watershed area subject to master drainage planning is bounded on the west by Interstate 25, Interquest Parkway/State Highway 83 on the north, south by Old Ranch Road and on the east by the Kettle Creek basin. The watershed contains both areas within the City and unincorporated El Paso County. The total watershed area covers 720 acres. The project site is shown on Figure 1.

The site is drained by two general sub-watersheds noted in the hydrologic analysis as sub-basin designated as "A" basins and "B" basins. Both of these sub-watershed outfall to an existing stormwater detention facility that lies just west of filing nos. 1 and 2 of the Fairlane Technological Park. The entire watershed eventually outfall across the land lying between the Park and Interstate 25. This land is owned by the U. S. Air Force Academy. The runoff from the basin is carried under Interstate 25 in a 60-inch culvert that eventually outfalls Monument Creek within the Academy, west of I-25. Previous studies completed for the watershed have established a 100-year historic flow of 195 cubic feet per second at the inlet of the 60-inch culvert beneath I-25.

PREVIOUS REPORTS

The following reports and plans were reviewed in the process of preparing this final drainage plan:

1. Soil Survey for El Paso County, Colorado, dated June 1981.

2. "City of Colorado Springs/El Paso County Drainage Criteria Manual", prepared by City of Colorado Springs, El Paso County, dated May 1987, revised 1996.

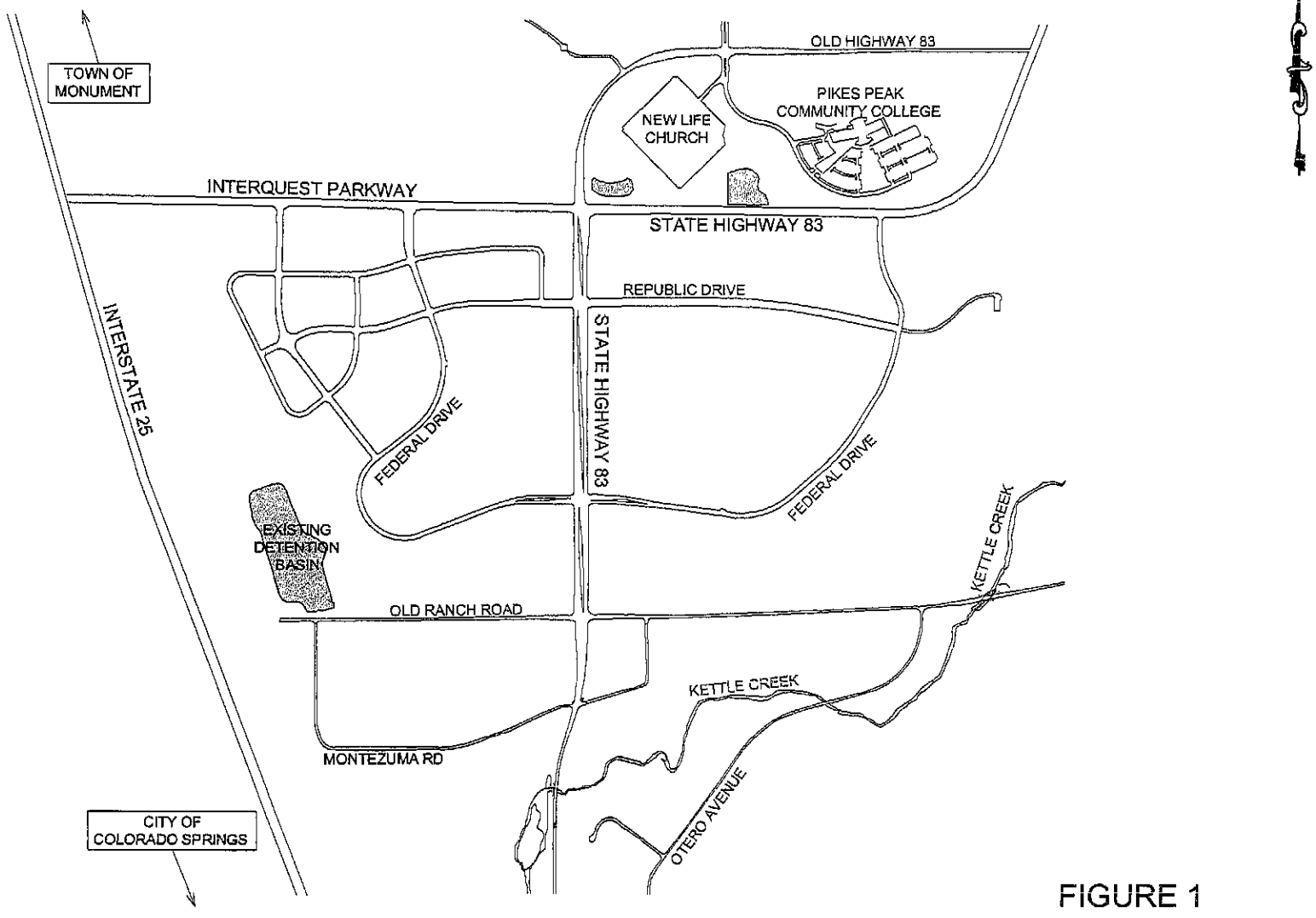


FIGURE 1
VICINITY MAP
FAIRLANE TECHNOLOGY PARK
MASTER DEVELOPMENT DRAINAGE PLAN UPDATE

3. "Flood Insurance Studies for Colorado Springs, and El Paso County, Colorado", prepared by the Federal Emergency Management Agency (FEMA), revised March, 1997.

4. Master Development Drainage Plan, Fairlane Technological Park prepared by URS Consultants, Inc., dated October 1993, revised January 1994.

5. Master Development Drainage Plan Update, Fairlane Technological Park prepared by Ayres Associates, Inc., dated November 1997.

6. Drainage Memorandum for Pikes Peak Community College North Campus, prepared by URS Consultants, Inc., dated October 1996.

7. Drainage Addendum No. 1 for the New Life Church Filing No. 2., prepared by Haynes and Associates, Ltd., dated May 1996.

8. Final Hydraulic Report, Interstate 25 and Fairlane Parkway Interchange, Phase 1, prepared by DMJM, Inc., dated August 1998.

9. Final Hydraulic Report, Interstate 25, Interquest Parkway/S. H. 83 Relocation, prepared by DMJM, Inc., dated March 1999.

Reference 4 was prepared as an update to the original Master Development Drainage Plan prepared for the Technological Park in 1986. The primary purpose of completing Reference 4 was to incorporate drainage criteria changes that were adopted in 1987, and to resize the stormwater infrastructure accordingly.

Reference 5 was completed in order to update Reference 4 so that changes in roadway layouts with regard to Interquest Parkway, State Highway 83 and Stout Allen Road could be accounted for in the hydrologic modeling of the watershed. Reference 5 also addressed the capacity of the existing Detention Basin "A" and defined the capacity for proposed Detention Basin "B". Both of these detention facilities were analyzed so that the maintenance of historic flows onto the Air Force Academy property could be assured. This study also recommended that detention basins A and B be located on Air Force Academy land. Siting the detention basins onto Air Force property has since been rejected by the Air Force.

References 8 and 9 were prepared as part of the construction of the Interquest Parkway/I-25 Interchange Project. These studies utilized the basic hydrologic analysis prepared as part of the work summarized in Reference 5. However the hydrologic changes affected by the realignment of State Highway 83 and future Powers Boulevard were considered in the reanalysis of the peak flow data and in the sizing of the storm sewer system for the Interchange and Interquest Parkway. Also the detention storage at the New Life Church and Pikes Peak Community College sites were modeled.

The purpose of this update is to refine the hydrologic modeling for the onsite and offsite watersheds within the Technological Park, to model existing storm sewer infrastructure constructed as part of the Interchange and Interquest Parkway projects, to reconfirm the watershed limits and sub-basin boundaries, and to examine the possibility of expanding existing Detention Basin A. Additionally, drainage planning and roadway layouts for the Park were updated so as to more accurately the model the hydrologic characteristics of the watershed.

HYDROLOGY

The offsite and onsite hydrology for the site was estimated using the methods outlined in the City/County Storm Drainage Criteria Manual. Topography for the site was compiled at a two-foot contour interval and a horizontal scale of one inch to 200-feet. This topography was used to verify the onsite sub-basin boundaries. Offsite sub-basin boundaries were determined using the above referenced reports, the City of Colorado Springs FIMS mapping base, and the USGS quadrangle maps for the area. Presented on the Hydrologic Sub-basin map (contained within map pocket at the rear of this report), are the basin divides and other related hydrologic data for the proposed development condition.

Developed condition peak discharges for the sub-basins and design points shown on the Hydrologic Sub-basin Map were determined for the 2-, 5-, 10-, 25-, 50- and 100-yaer recurrence intervals. Both the 6-hour and 24-hour storm duration were modeled using a Type IIA rainfall distribution. In general, the 24-hour storm duration produces higher peak discharges than the 6-hour duration storm for all sub-basins and design points.

The largest change to the hydrologic modeling for this watershed has occurred at offsite basin O-1. Within references 4 and 5, offsite basin O-1 was calculated to cover approximately 170 acres. With the proposed construction of Powers Boulevard a significant portion of offsite basin O-1 will now be directed towards the Black Squirrel basin. This results in a reduction of area within O-1 to approximately 19 acres. As the design of Powers Boulevard is advanced through the planning and design phases the routing of the runoff from the area encompassed by O-1 needs to be confirmed. The peak discharges that can be safely routed through the Fairlane Technological Park is limited to the capacity of the existing storm sewer system along Interquest Parkway. Runoff from an area larger than O-1 will have to be detained so as to not cause the existing Interquest Parkway storm sewer to become surcharged. Runoff patterns differing from what is assumed in this MDDP resulting from the construction of Powers Boulevard would also be limited by the capacity of the Interquest Parkway storm sewer.

Offsite sub-watershed O2B-1 also represents a change to the hydrologic sub-basin between this update and references 4 and 5. This offsite basin is currently undeveloped. The existing culvert under former State Highway 83 has the capability of passing approximately 35 cubic feet per second (cfs) to the Fairlane Technological Park watershed. For the purposes of this update, the entire runoff from O2B-1 was routed through the Technological Park watershed, without considering the restriction to only 35 cfs as in References 8 and 9. It was however assumed in the modeling that the runoff would be limited to only historic levels through onsite detention.

Since the area reduction of offsite sub-basin O-1 has been modeled in this update, an effort to route more of the developed flow from the areas west of State Highway 83 to the existing detention basin A was undertaken. Using the proposed street layouts associated with the filings currently in the development planning phase, storm sewer systems were evaluated that could collect developed runoff from areas that originally were assumed to be tributary to what was known as Detention basin B in references 4 and 5. The flow constraint onto the Air Force property was maintained at 195 cfs out of Detention Basin A. It was determined that Detention Basin A (if modified to accommodate a greater storage capacity), can handle a larger total tributary area from sub-watersheds west of State Highway 83 than assumed in references 4 and 5. It was determined that Sub-basin E, shown on the Hydrologic Sub-basin Map, can not be routed to Detention Basin A because of physical elevation differences that prevents the conveyance of runoff from sub-basin E to the Detention Basin A.

Curve numbers for the sub-watersheds used in this update are consistent with the values used in References 4, 5, 8 and 9. The curve numbers for the existing developed sub-watersheds were determined by measurement of the impervious areas off of the topographic mapping referenced above. The time of concentration for each sub-watershed was recalculated for the majority of the sub-watersheds that lie west of State Highway 83. The time of concentration was calculated using the methods outlined I Reference 2.

HYDROLOGY ANALYSIS

The hydrologic analysis for this project utilized the U. S. Army Corps of Engineers HEC-1 Flood Hydrograph Package. This computer model was used to estimate peak discharges for the 6-hour and 24-hour storm durations. The 2-, 5-, 10-, 25-, 50- and 100-year frequencies were modeled. This method was used because it allows for routing of the runoff through the existing storm sewer systems and through the existing and proposed detention facilities. Only proposed development condition was modeled. The routing

elements were modeled to be either open channels or storm sewers. The storm sewer built with the Interquest Parkway project was modeled. Proposed storm sewer outfall lines were also modeled within the undeveloped sub-watersheds. The latest roadway configuration for the area west of State Highway 83 were also considered when as the sub-watershed boundaries were determined. Presented on the Hydrologic Sub-basin Map are the basin divides, routing elements, and peak flow data at each of the key design points within the basin.

Detention storage was also modeled. Four existing detention facilities were modeled in the HEC-1 analysis. The detention basins at the New Life Church and at the Pikes Peak Community College were modeled and found to be adequate to reduce flows from the areas tributary to them to approximately historic levels. Both of these detention basins are sited within the "B" watershed. An existing detention basin within sub-watershed D was also modeled and found to safely route the developed runoff to the downstream drainageway.

Detention Basin A was modeled as is and with a proposed increased storage capability. It was found during the hydrologic analysis that this detention basin could not store the developed runoff tributary to it without the embankment being overtopped. Consequently, the storage and outflow characteristics of Detention Basin A were altered until the discharge rate of 170 cfs was maintained without the embankment or spillway being utilized. The changes required to store the developed runoff tributary to this facility are discussed later in this report.

A small detention basin will be required to detain developed runoff produced within Sub-basin E. The historic 100-year discharge rate at the outlet of Detention basin E is estimated at 40 cubic feet per seconds. The detained 100-year peak discharge out of Detention Basin E has been limited 17 cubic feet per second.

The computer model for the proposed condition with regional detention storage is contained within Appendix A. Peak flow data for the proposed development condition with detention is summarized on the Hydrologic Sub-basin Map contained in the map pocket of this report. Presented on Tables 1 and 2 is a summary of peak flow at each of the design points. Presented on Tables 3 and 4 is a summary of sub-basin peak discharges for the developed condition.

HYDRAULICS

The sizing of the storm sewer outfall lines was accomplished through an iterative procedure. Using the HEC-1 results at each design point, storm sewers were sized assuming a minimum slope. The required storm sewer data was input into the HEC-1

TABLE 1
SUMMARY OF DESIGN POINT DISCHARGES
FAIRLANE TECHNOLOGICAL PARK MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
24-HOUR STORM DURATION

DESIGN POINT NUMBER	LOCATION	DRAINAGE AREA (sm)	DRAINAGE AREA (ac)	DEVELOPED CONDITION 5 YR cfs	DEVELOPED CONDITION 100YR cfs
DP 1	AT OUTLET OF DET BASIN B9	0.13	83.2	42	108
DP 2	SH 83 AND INTERQUEST PARKWAY	0.28	179.2	58	207
DP 2A	SH 83 AND INTERQUEST PARKWAY	0.28	179.2	58	207
DP 3		0.31	198.4	76	252
DP 4	FEDERAL DR AND REPUBLIC DR	0.33	211.2	108	325
DP 4A	FEDERAL DR AND REPUBLIC DR	0.36	230.4	142	399
DP 5		0.37	236.8	154	427
DP 5A		0.04	25.6	54	120
DP 6		0.45	288.0	252	651
DP 7		0.03	19.2	44	99
DP 8	INFLOW TO DETENTION BASIN A	1.12	716.8	820	2091
DP 8 OUT	OUTFLOW FROM DETENTION BASIN A	1.12	716.8	106	170
DP 10	SH 83 AND FEDERAL DRIVE	0.25	160.0	280	647
DP 11	OUTFLOW FROM DETENTION BASIN D	0.11	70.4	65	171
DP 12	SH 83 AND OLD RANCH ROAD	0.40	256.0	351	860
DP 13	FEDERAL DRIVE	0.08	51.2	95	216
DP 14	EXISTING 60-INCH RCP UNDER I-25	1.16	742.4	109	200
DP 15	EXISTING 24-INCH RCP UNDER I-25	0.08	50.7	15	61
E1	OUTFLOW FROM DETENTION BASIN E	0.03	17.0	4	12

TABLE 2
SUMMARY OF DESIGN POINT DISCHARGES
FAIRLANE TECHNOLOGICAL PARK MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
6-HOUR STORM DURATION

DESIGN POINT NUMBER	LOCATION	DRAINAGE AREA (sm)	DRAINAGE AREA (ac)	DEVELOPED CONDITION 5 YR cfs	DEVELOPED CONDITION 100YR cfs
DP 1	AT OUTLET OF DET BASIN B9	0.13	83.2	24	83
DP 2	SH 83 AND INTERQUEST PARKWAY	0.28	179.2	34	130
DP 2A	SH 83 AND INTERQUEST PARKWAY	0.28	179.2	34	130
DP 3		0.31	198.4	49	171
DP 4	FEDERAL DR AND REPUBLIC DR	0.33	211.2	80	244
DP 4A	FEDERAL DR AND REPUBLIC DR	0.36	230.4	113	325
DP 5		0.37	236.8	126	347
DP 5A		0.04	25.6	55	124
DP 6		0.45	288.0	227	582
DP 7		0.03	19.2	47	108
DP 8	INFLOW TO DETENTION BASIN A	1.12	716.8	672	1734
DP 8 OUT	OUTFLOW FROM DETENTION BASIN A	1.12	716.8	77	161
DP 10	SH 83 AND FEDERAL DRIVE	0.25	160.0	252	575
DP 11	OUTFLOW FROM DETENTION BASIN D	0.11	70.4	48	130
DP 12	SH 83 AND OLD RANCH ROAD	0.40	256.0	297	729
DP 13	FEDERAL DRIVE	0.08	51.2	87	201
DP 14	EXISTING 60-INCH RCP UNDER I-25	1.16	742.4	79	169
DP 15	EXISTING 24-INCH RCP UNDER I-25	0.08	50.7	10	38
E1	OUTFLOW FROM DETENTION BASIN E	0.03	17.0	3	9

TABLE 3
SUMMARY OF SUB-BASIN DISCHARGES
FAIRLANE TECHNOLOGICAL PARK MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
24-HOUR STORM DURATION

DESIGN POINT NUMBER	DRAINAGE AREA (ac)	DEVELOPED CONDITION 5 YR cfs	100YR cfs
O1	19.2	12	50
O2B	44.6	6	60
B1	10.8	21	52
B1A	13.6	28	62
B1B	8.9	20	43
B2	5.7	13	28
B2A	10.4	21	48
B3	17.1	35	79
B4	8.7	19	43
B4A	7.1	14	32
B5	20.2	43	94
B6	17.8	36	81
B7	12.8	26	58
B7A	18.4	38	84
B8	40.0	55	148
B9	70.2	66	200
B10	15.1	9	37
A1	24.7	45	103
A2	27.5	51	115
A3	56.9	102	232
A4	23.7	20	67
A5	108.0	180	416
A6	34.6	27	87
A7	24.7	13	58
A8	18.8	33	75
A12	22.8	8	34
C	27.5	14	60
D	40.4	64	157
E1	17.0	31	71
E2	33.7	11	50

TABLE 4
SUMMARY OF SUB-BASIN DISCHARGES
FAIRLANE TECHNOLOGICAL PARK MASTER DEVELOPMENT DRAINAGE PLAN UPDATE
6-HOUR STORM DURATION

DESIGN POINT NUMBER	DRAINAGE AREA (ac)	DEVELOPED CONDITION 5 YR cfs	100YR cfs
O1	19.2	7	41
O2B	44.6	2	30
B1	10.8	26	58
B1A	13.6	29	65
B1B	8.9	22	50
B2	5.7	11	34
B2A	10.4	22	52
B3	17.1	36	81
B4	8.7	21	48
B4A	7.1	14	33
B5	20.2	44	99
B6	17.8	37	83
B7	12.8	27	60
B7A	18.4	39	87
B8	40.0	47	134
B9	70.2	48	178
B10	15.1	4	26
A1	24.7	41	95
A2	27.5	47	108
A3	56.9	91	212
A4	23.7	13	52
A5	108.0	161	367
A6	34.6	18	62
A7	24.7	7	40
A8	18.8	29	68
A12	22.8	5	21
C	27.5	7	40
D	40.4	57	141
E1	17.0	29	67
E2	33.7	7	31

model and the model recompiled. The hydraulic capacity of the existing and proposed storm sewer systems and channels is summarized on the Hydrologic Sub-basin Map. It was determined that the existing systems all have adequate capacity to convey the 100-year developed discharge. At some locations, a 5-year capacity storm sewer has been sized. The actual size, slope and location of these outfall lines will have to be reconfirmed as the individual subdivision drainage reports.

FLOODPLAIN STATEMENT

Shown on Figure 2 is the project site superimposed on the Flood Insurance Study FIRM panel for this area of Colorado Springs. There are no portions of this site that lie within a 100-year floodplain as depicted in the in the Colorado Springs Flood Insurance Study, prepared by the Federal Emergency Management Agency (FEMA).

CONCLUSIONS

The primary conclusion of this update is that Detention Basin A can be modified to store developed runoff from a greater area than calculated in the previous master development drainage plans. The existing detention basin embankment will have to be raised approximately 3.8 feet. A minor amount of grading within the storage area may have to take place to achieve the total required storage volume. Modification to the principal outlet structure will also be necessary to maintain the peak outflow from the basin to 195 cubic feet per second. A final design of the required modifications for Detention Basin A will be prepared for City review and approval.

In order to maintain flow out of developed sub-basin E, an onsite detention basin will be required. The maximum outflow of this detention basin will be limited to 17 cubic feet per second in a 100-year storm event.

The storage and outflow data for detention basins A through E is shown on the Hydrologic Sub-basin Map.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 506 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0506	F
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0506	F

MAP NUMBER
08041C0506 F

EFFECTIVE DATE:
MARCH 17, 1997

Federal Emergency Management Agency

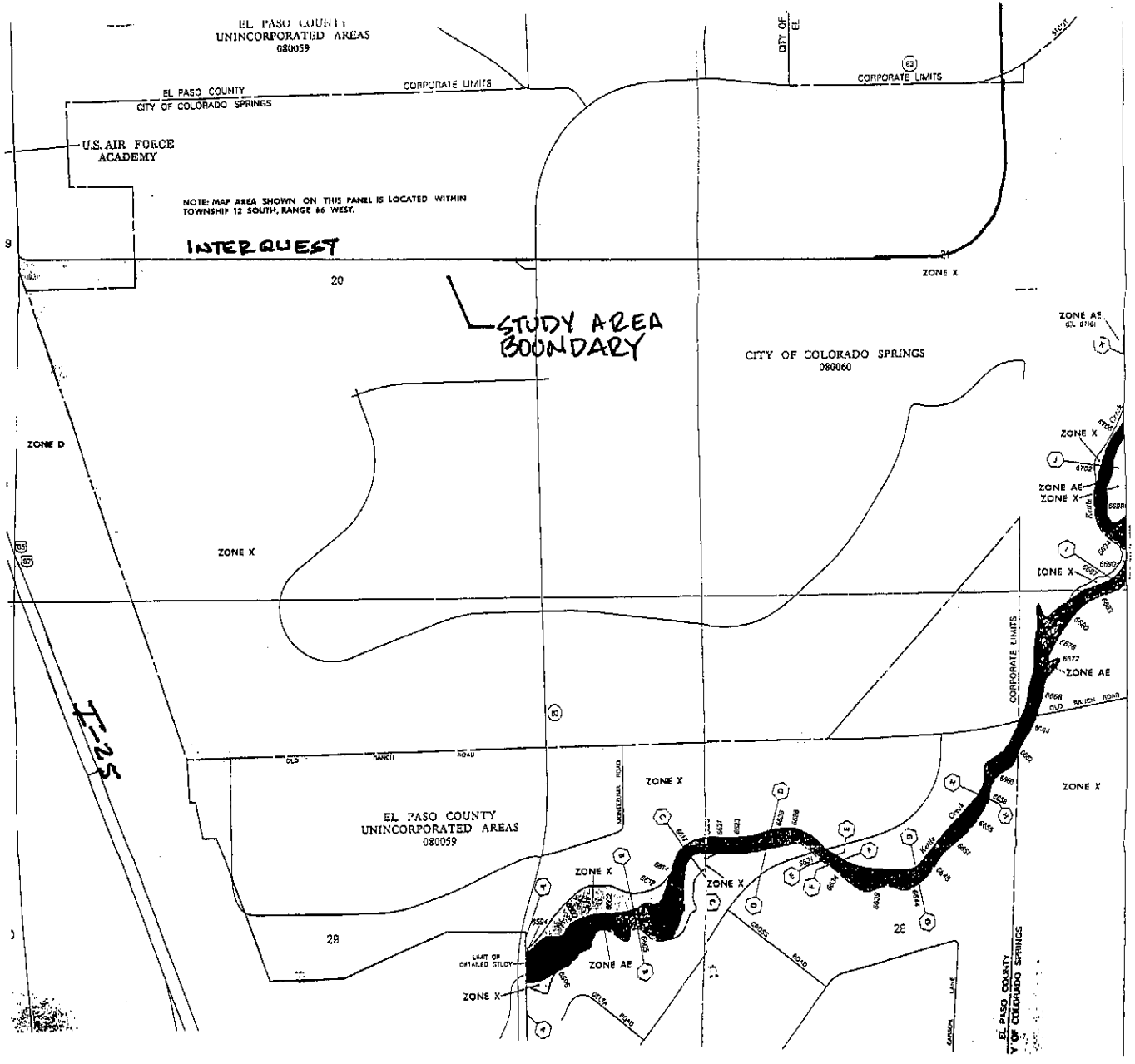


FIGURE 2

HYDROLOGIC CALCULATIONS

HEC-1 FLOOD HYDROGRAPH PACKAGE

APPENDIX A

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1*****************************************
 *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
 *              JUN  1998                *
 *            VERSION 4.1                *
 *                                       *
 *  RUN DATE   07FEB01  TIME  09:04:50   *
 *                                       *
 *****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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


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

   1          ID   HEC-1
   2          ID   FAIRLANE TECHNOLOGICAL PARK MDDP UPDATE
   3          ID   KIOWA ENGINEERING CORPORATION  JOB NO. 00084
   4          ID   DEVELOPED HYDROLOGY 2, 5, 10, 25, 50 AND 100-YEAR STORMS, 6 HOUR DURATION
   5          ID   FILENAME FT100A6.DAT  ALTERATIONS TO EX DETENTION BASIN A:  RAISE 3.8'
              *DIAGRAM
   6          IT       3       0       0     300
   7          IO       5
   8          JR    PREC     .49     .60     .69     .83     .89     1.0

   9          KK   B O1
  10          KM   MODIFIED BASIN O1 TO ACCOUNT FOR POWERS BLVD EXTENSION DIVERSION
  11          BA    .030
  12          LS            67.8
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 13          UD    .080
 14          IN      15
 15          PB     3.5
 16          PC     0.0   .0045   .0120   .0210   .0320   .0600   .7000   .7800   .8200   .8400
 17          PC   .8600   .8750   .8900   .9050   .9180   .9300   .9400   .9500   .9600   .9700
 18          PC   .9800   .9850   .9900  1.0000

 19          KK  B-O1
 20          KM   ROUTE B O1 TO DP1
 21          RD    2650   0.022   0.013            CIRC     3.0

 22          KK  B9
 23          KM   PIKES PEAK COMMUNITY COLLEGE BASIN
 24          BA   0.098
 25          LS             75
 26          UD    .114

 27          KK  B9OUT
 28          KM   ROUTE B9 THROUGH PIKES PEAK COLLEGE DETENTION BASIN
 29          RS       1    ELEV    6757
 30          SV       0     1.0    2.56    4.89    6.97
 31          SE    6757    6760    6762    6763    6764
 32          SQ       0    35.0    55.0    70.0     139

 33          KK  DP1
 34          KM    COMBINE B9OUT AND B-O1
 35          HC       2

 36          KK  B-9
 37          KM   ROUTE DP1 TO DP2
 38          RD    1375    .012    .013            CIRC     3.5

 39          KK  B10
 40          KM
 41          BA    .024
 42          LS             68
 43          UD    .126
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 44          KK  O2B
 45          KM   OFFSITE BASIN O2B PER DMJM PHASE II
 46          BA     .07
 47          LS             60
 48          UD    .170

 49          KK  O2B-1
 50          KM   ROUTE O2B TO DP2
 51          RD    3475   0.030   0.035            TRAP     6.0   3.0
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 52          KK  B8
 53          KM   NEW LIFE CHURCH BASIN
 54          BA    .063
 55          LS              80
 56          UD    .138

 57          KK  B8OUT
 58          KM    ROUTE B8 THROUGH NEW LIFE CHURCH DETENTON BASIN
 59          RS       1    ELEV    6736
 60          SV       0      .65    1.43    2.11    3.30    4.41
 61          SE    6736    6737    6738    6739    6740    6741
 62          SQ       0     4.3    14.0    22.0    28.0    31.0

 63          KK    DP2
 64          KM   COMBINE B8OUT, B10, B-9 AND O2B-1
 65          HC       4

 66          KK   B-9A
 67          KM    ROUTE DP2 TO DP 2A (6 X 2 CBC EQUIVALENT)
 68          RD     250    .005    .013            CIRC      4

 69          KK    B-8
 70          KM   ROUTE TO B-8 TO DP3  54-INCH RCP
 71          RD    1670    .025    .013            CIRC      4.5

 72          KK      B7
 73          KM   SUB-BASIN B7, NORTH PORTION OF INTERQUEST FILING NO. 3
 74          BA    .020
 75          LS              88
 76          UD    .152

 77          KK   DP3
 78          KM   COMBINE B-8 AND BASIN B7
 79          HC       2

 80          KK    B-7
 81          KM   ROUTE DP3 TO DP4  54-INCH RCP
 82          RD     550    .015    .013            CIRC      4.5
1                                        HEC-1 INPUT                                                    PAGE  3

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

 83          KK   B7A
 84          KM    SOUTH PORTION OF INTERQUEST FILING NO. 3
 85          BA    .029
 86          LS              88
 87          UD    .152

 88          KK   DP4
 89          KM   COMBINE BASIN B7A AND B-7
 90          HC       2
```

```
 91          KK   B-7A
 92          KM   ROUTE DP4 TO DP4A 60-INCH RCP
 93          RD     150    .015    .013            CIRC      5.0

 94          KK   B6
 95          KM    INTERQUEST FILING NO. 2
 96          BA    .028
 97          LS              88
 98          UD    .158

 99          KK   B-6
100          KM   ROUTE SUB-BASIN B6 TO DP 4A  42-INCH RCP
101          RD     150    .015    .013            CIRC      3.5

102          KK   DP4A
103          KM   COMBINE B6 AND B-7A
104          HC       2

105          KK    B-5
106          KM   ROUTE TO DP4A TO DP 5 60-INCH RCP
107          RD    1150    .024    .013            CIRC      5.0

108          KK     B4A
109          KM   SUB-BASIN B4A
110          BA    .011
111          LS              88
112          UD    .158

113          KK    DP5
114          KM   COMBINE B4A AND B-5
115          HC       2

116          KK    B-5A
117          KM   ROUTE TO DP5 TO DP 6 60-INCH RCP
118          RD     650    .020    .013            CIRC       5

119          KK      B5
120          KM    SUB-BASIN B5
121          BA    .032
122          LS              88
123          UD    .141
```



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

124          KK      B3
125          KM   SUB-BASIN B3
126          BA    .027
127          LS              88
128          UD    .150
```

```
129          KK    B-4
130          KM   ROUTE TO B3 TO DP5A 36 -INCH RCP
131          RD     650     .010     .013            CIRC       3

132          KK      B4
133          KM    SUB-BASIN B4
134          BA    .014
135          LS              88
136          UD    .119

137          KK    DP5A
138          KM   COMBINE B-4 AND B4
139          HC       2

140          KK    B-2
141          KM   ROUTE TO DP5A TO DP6 42-INCH RCP
142          RD     680     .010     .013            CIRC      3.5

143          KK      B2
144          KM    SUB-BASIN B2
145          BA    .009
146          LS              88
147          UD    .083

148          KK    DP6
149          KM   COMBINE B-5A, B5, B-2 AND B2
150          HC       4

151          KK    B-1
152          KM   ROUTE TO DP6 TO DP8  66-INCH RCP
153          RD    1000     .025     .013            CIRC      5.5

154          KK      B2A
155          KM    SUB-BASIN B2A
156          BA    .016
157          LS              88
158          UD    .133

159          KK    B-2A
160          KM   ROUTE B2A TO DP7  30-INCH RCP
161          RD     600     .020     .013            CIRC       3

162          KK      B1
163          KM    SUB-BASIN B1
164          BA    .017
165          LS              88
166          UD    .120
```



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

```
167          KK     DP7
168          KM   COMBINE B1 AND B-2A
169          HC       2

170          KK    B-2B
171          KM   ROUTE DP7 TO DP 8, DETETNION BASIN A  48-INCH RCP
172          RD    1000     .004    .013             CIRC        4

173          KK      B1A
174          KM    SUB-BASIN B1A DIRECT FLOW TO DP 8 DETENTION BASIN A
175          BA    .021
176          LS              88
177          UD    .141

178          KK      B1B  DIRECT FLOW TO DP 8, DETENTION BASIN A
179          KM   SUB-BASIN B1B
180          BA    .014
181          LS              88
182          UD    .107

183          KK      A3
184          KM   SUB-BASIN A3
185          BA    .089
186          LS              88
187          UD    .230

188          KK    A-3
189          KM   ROUTE SUB-BASIN A3 TO DP10  48-INCH RCP
190          RD    1800   0.018   0.013             CIRC        4

191          KK      A5
192          KM   SUB-BASIN A5
193          BA   0.164
194          LS              88
195          UD    .250

196          KK    DP10
197          KM   COMBINE A-3 AND A5
198          HC       2

199          KK    A-7
200          KM   ROUTE DP10 TO DP 12
201          RD    1100     .005    .015             TRAP        6      1.5

202          KK      A7
203          KM   SUB-BASIN A7
204          BA    .039
205          LS              68
206          UD    .140
```

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

 207      KK    C
 208      KM   SUB-BASIN C
 209      BA    .043
 210      LS              68
 211      UD    .160

 212      KK    D-1
 213      KM     ROUTE SUB-BASIN C TO DP 11  30" RCP
 214      RD    2400    .020    .013            CIRC       4     2.5

 215      KK      D
 216      KM   SUB-BASIN D
 217      BA    .063
 218      LS              85
 219      UD    .200

 220      KK   DOUT
 221      KM   DETENTION BASIN D OUTFLOW
 222      RS       1    ELEV    6689
 223      SV       0     .01     .30     .90    1.68    2.68    3.28
 224      SE    6689    6690    6692    6694    6696    6698    6699
 225      SQ       0       0    22.0    70.0     110     140     150

 226      KK   DP11
 227      KM    COMBINE D-1 AND DOUT
 228      HC       2

 229      KK   A-7A
 230      KM   ROUTE DP11 TO DP12
 231      RD    1050    .020    .013            CIRC       4

 232      KK    DP12
 233      KM   COMBINE A-7A, A7, AND A-7
 234      HC       3

 235      KK   A-8
 236      KM   ROUTE DP12 TO DP8, DETENTION BASIN A
 237      RD    3200    .020    .015            TRAP       6     1.5

 238      KK    A4
 239      KM    SUB-BASIN A4, DIRECT FLOW TO DP8, DETENTION BASIN A
 240      BA    .037
 241      LS              74
 242      UD    .162

 243      KK   A1
 244      KM    SUB-BASIN A1
 245      BA    .039
 246      LS              88
```

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

  247     UD    .223

  248     KK   A-1
  249     KM    ROUTE A1 TO DP 13  30-INCH RCP
  250     RD     800    .013    .013            CIRC     2.5

  251     KK   A2
  252     KM    SUB-BASIN A2  INTERQUEST FILING NO. 1
  253     BA    .043
  254     LS             88
  255     UD    .212

  256     KK    DP13
  257     KM    COMBINE A2 AND A-1
  258     HC       2

  259     KK   A-2
  260     KM    ROUTE DP13 TP DP8. DETENTION BASIN A
  261     RD     500    .030    .013            CIRC     4.0

  262     KK   A6
  263     KM   SUB-ASIN A6, DIRECT FLOW TO DP8. DETENTION BASIN A
  264     BA    .054
  265     LS             76
  266     UD    .263

  267     KK   A8
  268     KM   SUB-BASIN A8 FAIRLANE TECH PARK NO. 3
  269     BA    .029
  270     LS             88
  271     UD    .237

  272     KK   A-8A
  273     KM    ROUTE A8 TO DP 8, DETENTION BASIN A
  274     RD     520    .020    .035            TRAP     6.0    3.0

  275     KK   DP 8
  276     KM    INFLOW TO DETENTION BASIN A
  277     HC       9

  278     KK  DP8OUT
  279     KM   DETENTION BASIN A OUTFLOW WITH NO MODIFICATIONS
  280     RS       1    ELEV    6614
  281     SV       0    0.84    7.06   19.91   36.66   55.02   74.87   96.98  112.72
  282     SE    6614    6616    6618    6620    6622    6624    6626    6628    6630
  283     SQ       0      16      39      52     125     150     170     170     170

  284     KK   A-12
```

```
          285          KM    ROUTE DP8OUT TO DP14
          286          RD     700    .010    .035           TRAP    20.0     2.0
1                                          HEC-1 INPUT                                                    PAGE  8

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

          287          KK   A12
          288          KM   SUB-BASIN A12, AFA DIRECT FLOW TO DP14
          289          BA    .036
          290          LS              70
          291          UD    .400

          292          KK   DP 14
          293          KM    COMBINE A-12 AND A12
          294          HC       2

          295          KK   E1
          296          KM   SUB-BASIN E1
          297          BA    .026
          298          LS              88
          299          UD    .20

          300          KK   E1OUT
          301          KM    DETENTION BASIN E1A
          302          RS       1    ELEV    6620
          303          SV       0     .65    1.43    2.11    3.30    4.41
          304          SE    6620    6621    6622    6623    6624    6625
          305          SQ       0     2.3     6.0    10.0    15.0    20.0

          306          KK   E-1
          307          KM    ROUTE DETTENION BASIN E1OUT TO DP 15
          308          RD     900    .020    .035           TRAP    10.0     2.0

          309          KK   E2
          310          KM   SUB-BASIN E2   AFA DIRECT FLOW TO DP15
          311          BA    .053
          312          LS              70
          313          UD    .400

          314          KK   DP 15
          315          KM    COMBINE E-1 AND E2
          316          HC       2
          317          ZZ
1
               SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

     9       B 01
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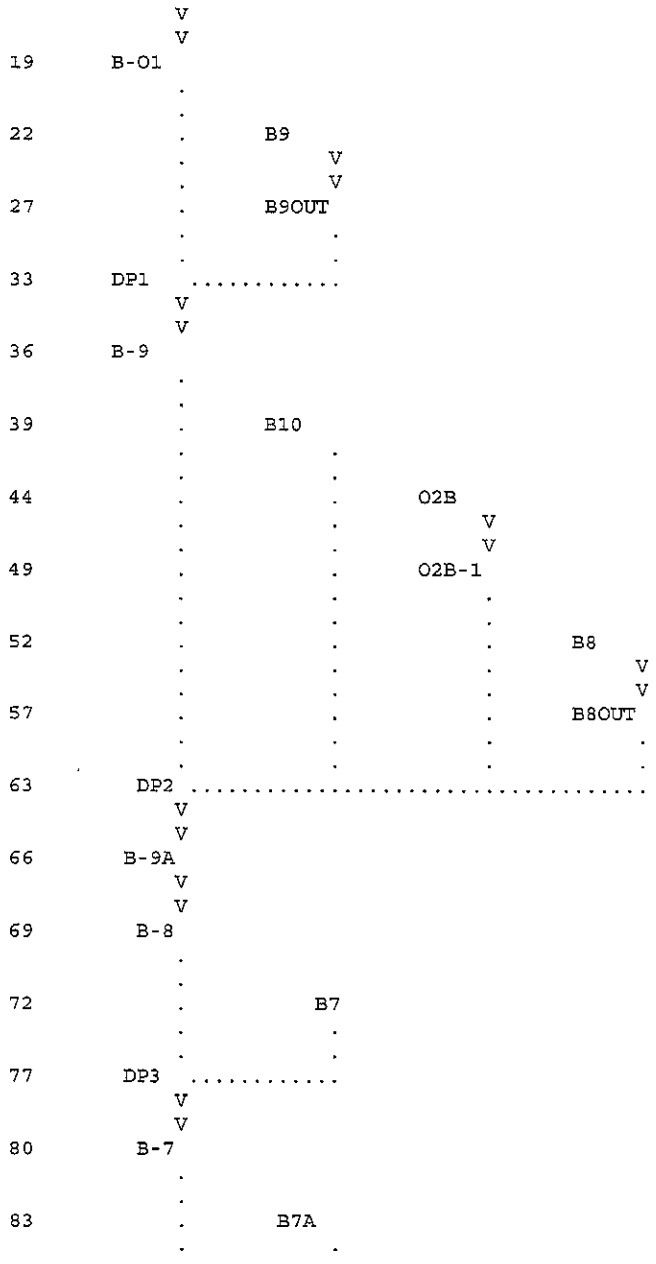
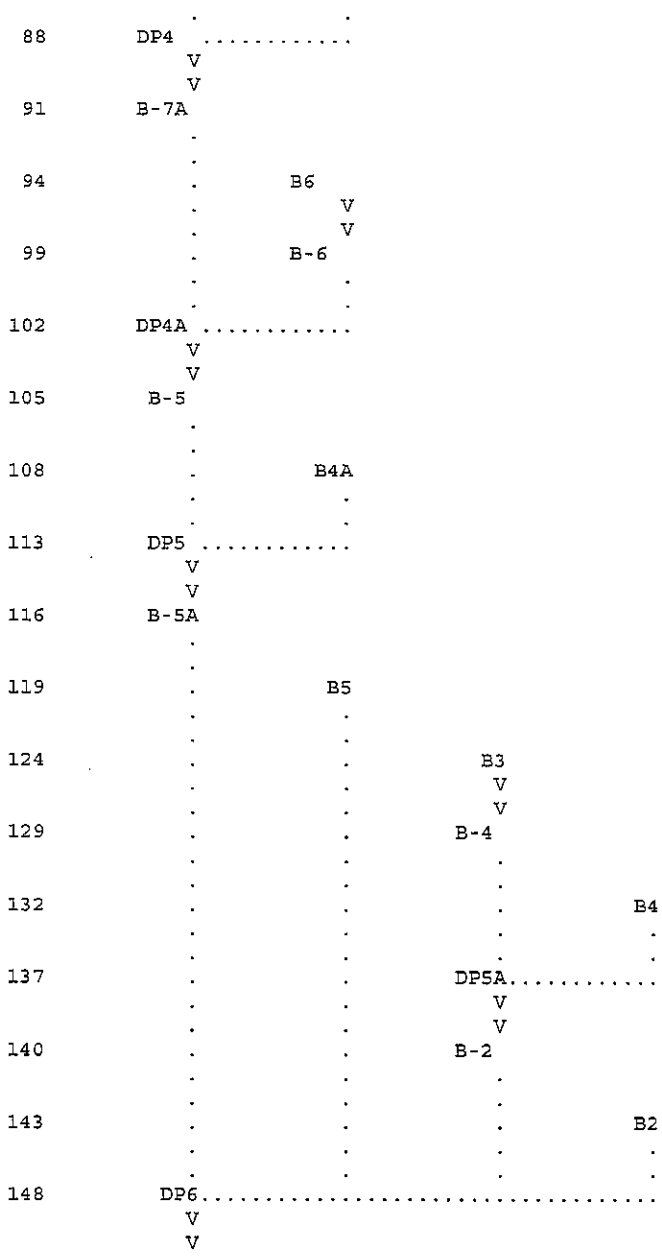
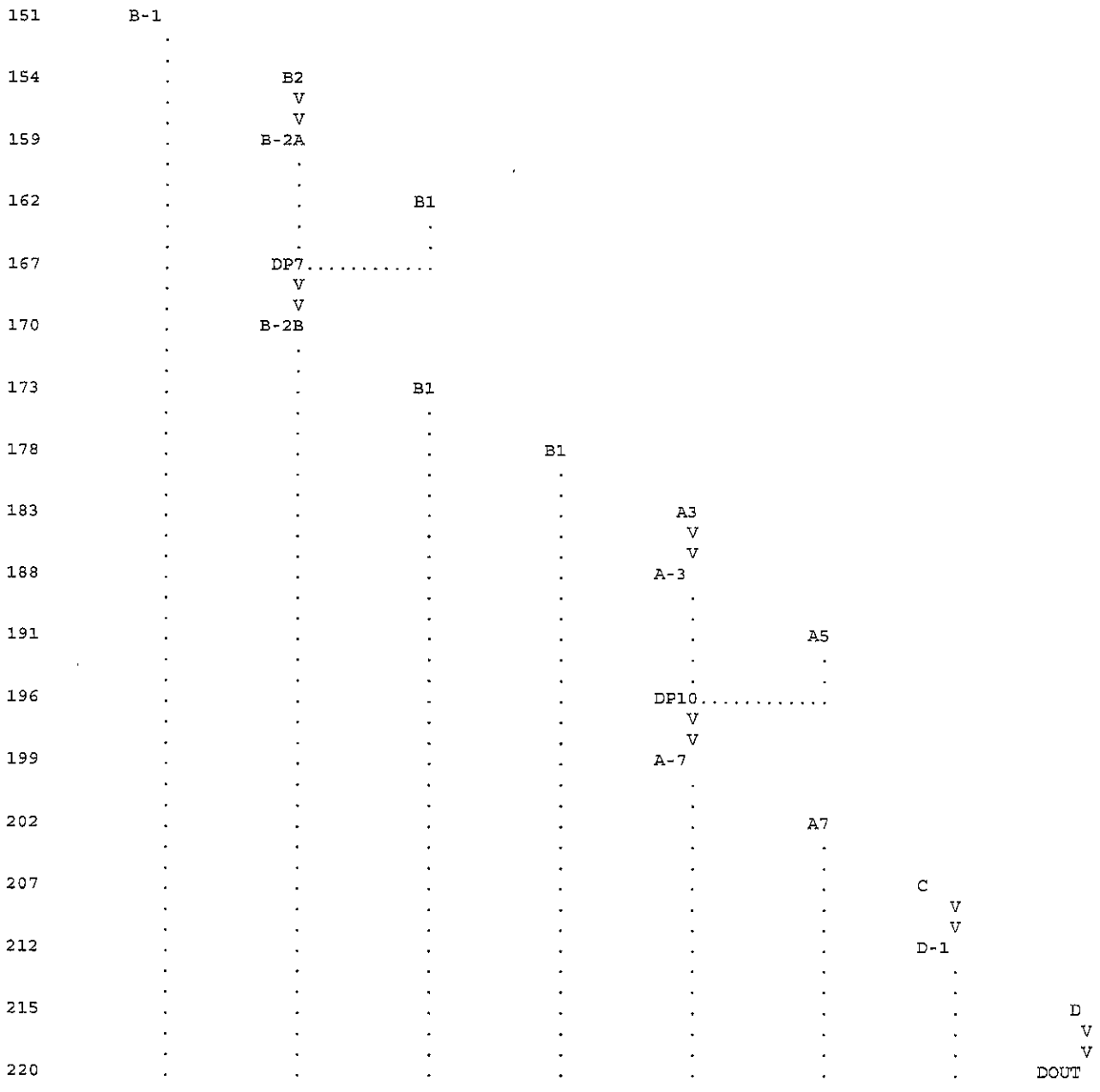
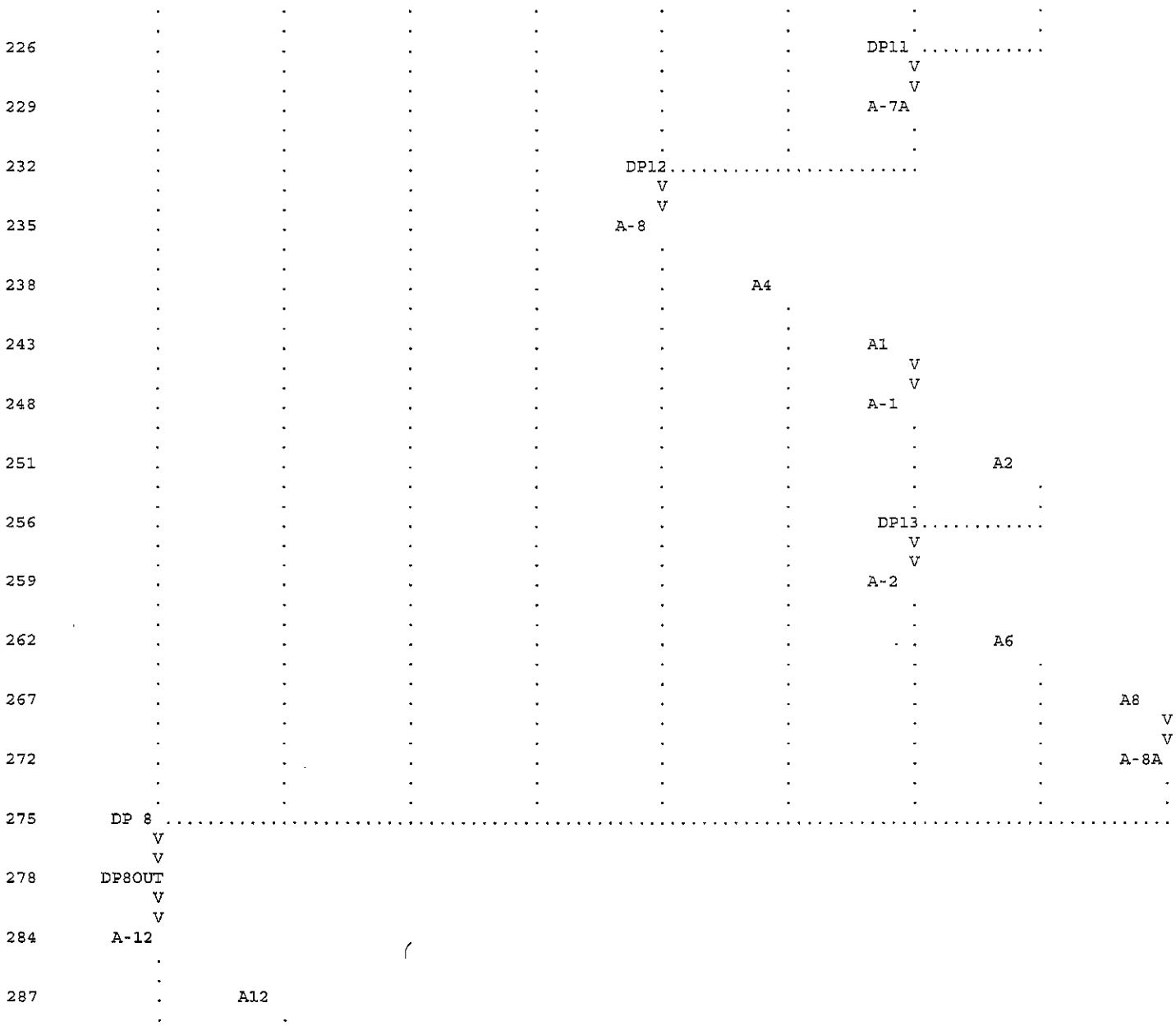
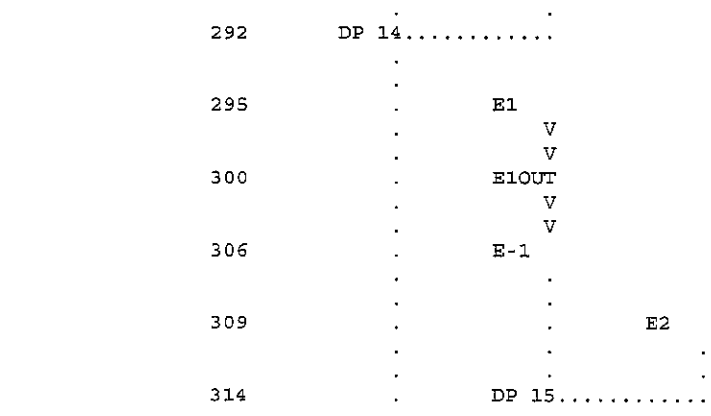

19
B-O1
22
B9
27
B9OUT
33
DP1
36
B-9
39
B10
44
O2B
49
O2B-1
52
B8
57
B8OUT
63
DP2
66
B-9A
69
B-8
72
B7
77
DP3
80
B-7
83
B7A


88
DP4
91
B-7A
94
B6
99
B-6
102
DP4A
105
B-5
108
B4A
113
DP5
116
B-5A
119
B5
124
B3
129
B-4
132
B4
137
DP5A
140
B-2
143
B2
148
DP6


151
B-1
154
B2
159
B-2A
162
B1
167
DP7
170
B-2B
173
B1
178
B1
183
A3
188
A-3
191
A5
196
DP10
199
A-7
202
A7
207
C
212
D-1
215
D
220
DOUT


226
DP11
229
A-7A
232
DP12
235
A-8
238
A4
243
A1
248
A-1
251
A2
256
DP13
259
A-2
262
A6
267
A8
272
A-8A
275
DP 8
278
DP8OUT
284
A-12
287
A12



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   07FEB01  TIME  09:04:50   *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

```
                    HEC-1
                    FAIRLANE TECHNOLOGICAL PARK MDDP UPDATE
                    KIOWA ENGINEERING CORPORATION  JOB NO. 00084
                    DEVELOPED HYDROLOGY 2, 5, 10, 25, 50 AND 100-YEAR STORMS, 6 HOUR DURATION
                    FILENAME FT100A6.DAT  ALTERATIONS TO EX DETENTION BASIN A:  RAISE 3.8'

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

    IT          HYDROGRAPH TIME DATA
                       NMIN          3  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1   0  ENDING DATE
                     NDTIME       1457  ENDING TIME
                     ICENT         19  CENTURY MARK
```

COMPUTATION INTERVAL .05 HOURS
TOTAL TIME BASE 14.95 HOURS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.49 .60 .69 .83 .89 1.00

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .49	RATIO 2 .60	RATIO 3 .69	RATIO 4 .83	RATIO 5 .89	RATIO 6 1.00
HYDROGRAPH AT										
+	B 01	.03	1	FLOW	2.	7.	13.	24.	30.	41.
				TIME	1.55	1.55	1.55	1.55	1.55	1.55
ROUTED TO										
+	B-01	.03	1	FLOW	2.	6.	12.	24.	29.	39.
				TIME	1.65	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	B9	.10	1	FLOW	25.	48.	73.	117.	138.	178.
				TIME	1.60	1.60	1.55	1.55	1.55	1.55
ROUTED TO										
+	B9OUT	.10	1	FLOW	11.	21.	30.	41.	45.	53.
				TIME	1.85	1.80	1.75	1.80	1.80	1.80
			** PEAK STAGES IN FEET **							
			1	STAGE	6757.91	6758.76	6759.61	6760.61	6761.02	6761.84
				TIME	1.85	1.80	1.75	1.80	1.80	1.80
2 COMBINED AT										
+	DP1	.13	1	FLOW	12.	24.	37.	59.	67.	83.

				TIME	1.80	1.70	1.65	1.60	1.60	1.60
ROUTED TO										
+	B-9	.13	1	FLOW	12.	24.	37.	58.	66.	80.
				TIME	1.85	1.75	1.70	1.65	1.65	1.65
HYDROGRAPH AT										
+	B10	.02	1	FLOW	1.	4.	8.	15.	19.	26.
				TIME	1.65	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	O2B	.07	1	FLOW	0.	2.	5.	14.	19.	30.
				TIME	5.00	1.85	1.75	1.65	1.65	1.65
ROUTED TO										
+	O2B-1	.07	1	FLOW	0.	2.	5.	15.	19.	29.
				TIME	5.50	2.20	1.90	1.80	1.85	1.80
HYDROGRAPH AT										
+	B8	.06	1	FLOW	28.	47.	64.	94.	108.	134.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
ROUTED TO										
+	B8OUT	.06	1	FLOW	4.	8.	13.	19.	22.	25.
				TIME	2.15	2.05	2.00	1.95	1.95	1.95
			**	PEAK STAGES IN FEET **						
			1	STAGE	6736.96	6737.43	6737.85	6738.67	6739.04	6739.51
				TIME	2.15	2.05	2.00	1.95	1.95	1.95
4 COMBINED AT										
+	DP2	.28	1	FLOW	17.	34.	53.	90.	101.	130.
				TIME	1.85	1.80	1.90	1.80	1.80	1.80
ROUTED TO										
+	B-9A	.28	1	FLOW	17.	34.	53.	89.	101.	130.
				TIME	1.85	1.80	1.90	1.80	1.85	1.80
ROUTED TO										
+	B-8	.28	1	FLOW	17.	34.	52.	87.	101.	130.
				TIME	1.90	1.85	1.75	1.85	1.85	1.80
HYDROGRAPH AT										
+	B7	.02	1	FLOW	18.	27.	34.	45.	50.	60.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
2 COMBINED AT										
+	DP3	.31	1	FLOW	25.	49.	74.	118.	136.	171.
				TIME	1.70	1.70	1.70	1.65	1.65	1.65
ROUTED TO										
+	B-7	.31	1	FLOW	25.	49.	74.	116.	134.	169.

				TIME	1.70	1.70	1.70	1.65	1.65	1.65
HYDROGRAPH AT										
+	B7A	.03	1	FLOW	27.	39.	49.	66.	73.	87.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
2 COMBINED AT										
+	DP4	.33	1	FLOW	48.	80.	113.	172.	197.	244.
				TIME	1.60	1.65	1.65	1.65	1.65	1.60
ROUTED TO										
+	B-7A	.33	1	FLOW	48.	80.	113.	172.	196.	243.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
HYDROGRAPH AT										
+	B6	.03	1	FLOW	25.	37.	47.	63.	70.	83.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
ROUTED TO										
+	B-6	.03	1	FLOW	25.	37.	46.	62.	70.	83.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
2 COMBINED AT										
+	DP4A	.36	1	FLOW	72.	113.	155.	227.	260.	325.
				TIME	1.60	1.65	1.65	1.65	1.60	1.60
ROUTED TO										
+	B-5	.36	1	FLOW	71.	113.	154.	227.	258.	319.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
HYDROGRAPH AT										
+	B4A	.01	1	FLOW	10.	14.	18.	25.	27.	33.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
2 COMBINED AT										
+	DP5	.37	1	FLOW	80.	126.	170.	249.	283.	347.
				TIME	1.65	1.65	1.65	1.65	1.65	1.60
ROUTED TO										
+	B-5A	.37	1	FLOW	80.	125.	169.	248.	282.	347.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
HYDROGRAPH AT										
+	B5	.03	1	FLOW	30.	44.	55.	74.	83.	99.
				TIME	1.60	1.60	1.60	1.55	1.55	1.55
HYDROGRAPH AT										
+	B3	.03	1	FLOW	25.	36.	46.	61.	68.	81.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
ROUTED TO										
+	B-4	.03	1	FLOW	24.	35.	45.	61.	68.	81.

				TIME	1.60	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	B4	.01	1	FLOW	15.	21.	27.	36.	40.	48.
				TIME	1.55	1.55	1.55	1.55	1.55	1.55
2 COMBINED AT										
+	DP5A	.04	1	FLOW	38.	55.	69.	93.	103.	124.
				TIME	1.60	1.60	1.60	1.60	1.60	1.55
ROUTED TO										
+	B-2	.04	1	FLOW	37.	54.	69.	93.	103.	123.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	B2	.01	1	FLOW	11.	15.	19.	25.	28.	34.
				TIME	1.55	1.55	1.55	1.50	1.50	1.50
4 COMBINED AT										
+	DP6	.45	1	FLOW	151.	227.	297.	420.	475.	582.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
ROUTED TO										
+	B-1	.45	1	FLOW	147.	222.	290.	411.	466.	572.
				TIME	1.60	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	B2A	.02	1	FLOW	15.	22.	29.	39.	43.	52.
				TIME	1.60	1.55	1.55	1.55	1.55	1.55
ROUTED TO										
+	B-2A	.02	1	FLOW	15.	22.	28.	37.	42.	50.
				TIME	1.60	1.60	1.60	1.55	1.55	1.55
HYDROGRAPH AT										
+	B1	.02	1	FLOW	18.	26.	33.	44.	49.	58.
				TIME	1.55	1.55	1.55	1.55	1.55	1.55
2 COMBINED AT										
+	DP7	.03	1	FLOW	32.	47.	60.	81.	91.	108.
				TIME	1.55	1.55	1.55	1.55	1.55	1.55
ROUTED TO										
+	B-2B	.03	1	FLOW	31.	46.	59.	80.	89.	105.
				TIME	1.65	1.60	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	B1A	.02	1	FLOW	20.	29.	36.	49.	55.	65.
				TIME	1.60	1.60	1.60	1.55	1.55	1.55
HYDROGRAPH AT										
+	B1B	.01	1	FLOW	16.	22.	28.	38.	42.	50.

				TIME	1.55	1.55	1.55	1.55	1.55	1.55
HYDROGRAPH AT										
+	A3	.09	1	FLOW	62.	91.	117.	159.	178.	212.
				TIME	1.70	1.65	1.65	1.65	1.65	1.65
ROUTED TO										
+	A-3	.09	1	FLOW	62.	92.	117.	157.	175.	208.
				TIME	1.70	1.70	1.70	1.70	1.70	1.70
HYDROGRAPH AT										
+	A5	.16	1	FLOW	110.	161.	205.	277.	308.	367.
				TIME	1.70	1.70	1.70	1.70	1.70	1.70
2 COMBINED AT										
+	DP10	.25	1	FLOW	172.	252.	321.	433.	483.	575.
				TIME	1.70	1.70	1.70	1.70	1.70	1.70
ROUTED TO										
+	A-7	.25	1	FLOW	170.	247.	317.	429.	479.	573.
				TIME	1.75	1.70	1.70	1.70	1.70	1.70
HYDROGRAPH AT										
+	A7	.04	1	FLOW	2.	7.	12.	23.	29.	40.
				TIME	1.65	1.65	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	C	.04	1	FLOW	2.	7.	13.	23.	29.	40.
				TIME	1.70	1.65	1.65	1.65	1.60	1.60
ROUTED TO										
+	D-1	.04	1	FLOW	2.	7.	12.	23.	29.	40.
				TIME	1.75	1.70	1.70	1.65	1.65	1.65
HYDROGRAPH AT										
+	D	.06	1	FLOW	37.	57.	74.	104.	117.	141.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
ROUTED TO										
+	DOUT	.06	1	FLOW	27.	42.	55.	75.	82.	97.
				TIME	1.80	1.75	1.75	1.75	1.75	1.75
			** PEAK STAGES IN FEET **							
			1	STAGE	6692.21	6692.81	6693.37	6694.25	6694.62	6695.35
				TIME	1.80	1.75	1.75	1.75	1.75	1.75
2 COMBINED AT										
+	DP11	.11	1	FLOW	29.	48.	66.	95.	107.	130.
				TIME	1.80	1.75	1.75	1.70	1.70	1.70
ROUTED TO										
+	A-7A	.11	1	FLOW	29.	47.	65.	95.	106.	129.

				TIME	1.80	1.80	1.75	1.75	1.75	1.75
3 COMBINED AT										
+	DP12	.40	1	FLOW	200.	297.	387.	539.	605.	729.
				TIME	1.75	1.75	1.70	1.70	1.70	1.70
ROUTED TO										
+	A-8	.40	1	FLOW	197.	296.	385.	534.	598.	718.
				TIME	1.80	1.75	1.75	1.75	1.75	1.75
HYDROGRAPH AT										
+	A4	.04	1	FLOW	7.	13.	20.	34.	40.	52.
				TIME	1.65	1.65	1.60	1.60	1.60	1.60
HYDROGRAPH AT										
+	A1	.04	1	FLOW	28.	41.	53.	71.	80.	95.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
ROUTED TO										
+	A-1	.04	1	FLOW	28.	40.	51.	70.	78.	93.
				TIME	1.70	1.70	1.65	1.65	1.65	1.65
HYDROGRAPH AT										
+	A2	.04	1	FLOW	32.	47.	60.	81.	90.	108.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
2 COMBINED AT										
+	DP13	.08	1	FLOW	59.	87.	111.	151.	168.	201.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
ROUTED TO										
+	A-2	.08	1	FLOW	59.	86.	110.	150.	167.	200.
				TIME	1.70	1.65	1.65	1.65	1.65	1.65
HYDROGRAPH AT										
+	A6	.05	1	FLOW	9.	18.	26.	41.	48.	62.
				TIME	1.75	1.75	1.75	1.75	1.70	1.70
HYDROGRAPH AT										
+	A8	.03	1	FLOW	20.	29.	37.	51.	56.	68.
				TIME	1.70	1.70	1.65	1.65	1.65	1.65
ROUTED TO										
+	A-8A	.03	1	FLOW	20.	29.	37.	50.	56.	67.
				TIME	1.70	1.70	1.70	1.70	1.70	1.70
9 COMBINED AT										
+	DP 8	1.12	1	FLOW	438.	672.	884.	1246.	1417.	1734.
				TIME	1.70	1.70	1.70	1.65	1.65	1.65
ROUTED TO										
+	DP8OUT	1.12	1	FLOW	49.	77.	110.	139.	147.	161.

				TIME	2.90	2.75	2.65	2.70	2.75	2.85
			** PEAK STAGES IN FEET **							
			1	STAGE	6619.51	6620.70	6621.58	6623.09	6623.80	6625.08
				TIME	2.85	2.75	2.65	2.70	2.75	2.85
ROUTED TO										
+	A-12	1.12	1	FLOW	49.	77.	110.	139.	147.	161.
				TIME	2.90	2.80	2.70	2.75	2.80	2.90
HYDROGRAPH AT										
+	A12	.04	1	FLOW	2.	5.	7.	13.	16.	21.
				TIME	2.00	1.95	1.95	1.90	1.90	1.90
2 COMBINED AT										
+	DP 14	1.16	1	FLOW	50.	79.	112.	143.	153.	169.
				TIME	2.75	2.75	2.60	2.35	2.35	2.10
HYDROGRAPH AT										
+	E1	.03	1	FLOW	20.	29.	37.	50.	56.	67.
				TIME	1.65	1.65	1.65	1.65	1.65	1.65
ROUTED TO										
+	E1OUT	.03	1	FLOW	2.	3.	4.	6.	7.	9.
				TIME	2.35	2.30	2.25	2.25	2.20	2.20
			** PEAK STAGES IN FEET **							
			1	STAGE	6620.93	6621.28	6621.57	6622.05	6622.28	6622.72
				TIME	2.35	2.30	2.25	2.25	2.20	2.20
ROUTED TO										
+	E-1	.03	1	FLOW	2.	3.	4.	6.	7.	9.
				TIME	2.45	2.35	2.35	2.30	2.30	2.25
HYDROGRAPH AT										
+	E2	.05	1	FLOW	3.	7.	11.	19.	23.	31.
				TIME	2.00	1.95	1.95	1.90	1.90	1.90
2 COMBINED AT										
+	DP 15	.08	1	FLOW	5.	10.	15.	24.	29.	38.
				TIME	2.05	2.00	2.00	1.95	1.95	1.95

1

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*             VERSION 4.1               *
*                                       *
*  RUN DATE   08FEB01  TIME  11:28:18   *
*                                       *
*****************************************
```

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

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

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

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

1 HEC-1 INPUT PAGE 1

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

   1          ID   HEC-1
   2          ID   FAIRLANE TECHNOLOGICAL PARK MDDP UPDATE
   3          ID   KIOWA ENGINEERING CORPORATION  JOB NO. 00084
   4          ID   DEVELOPED HYDROLOGY 2, 5, 10, 25, 50 AND 100-YEAR STORMS, 24 HOUR DURATION
   5          ID   FILENAME FT100A.DAT  ALTERATIONS TO EX DETENTION BASIN A:  RAISE 3.8'
              *DIAGRAM
   6          IT       3       0       0     300
   7          IO       5
   8          JR    PREC     .48     .56     .73     .82     .91     1.0

   9          KK    B O1
  10          KM   MODIFIED BASIN O1 TO ACCOUNT FOR POWERS BLVD EXTENSION DIVERSION
  11          BA    .030
  12          LS            67.8
```

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 13          UD    .080
 14          IN      15
 15          PB     4.4
 16          PC     0.0   .0005   .0015   .0030   .0045   .0060   .0080   .0100   .0120   .0143
 17          PC   .0165   .0188   .0210   .0233   .0255   .0278   .0320   .0390   .0460   .0530
 18          PC   .0600   .0750   .1000   .4000   .7000   .7250   .7500   .7650   .7800   .7900
 19          PC   .8000   .8100   .8200   .8250   .8300   .8350   .8400   .8450   .8500   .8550
 20          PC   .8600   .8638   .8675   .8713   .8750   .8788   .8825   .8863   .8900   .8938
 21          PC   .8975   .9013   .9050   .9083   .9115   .9148   .9180   .9210   .9240   .9270
 22          PC   .9300   .9325   .9350   .9375   .9400   .9425   .9450   .9475   .9500   .9525
 23          PC   .9550   .9575   .9600   .9625   .9650   .9675   .9700   .9725   .9750   .9775
 24          PC   .9800   .9813   .9825   .9838   .9850   .9863   .9875   .9888   .9900   .9913
 25          PC   .9963   .9975   .9988  1.0000

 26          KK  B-O1
 27          KM   ROUTE B O1 TO DP1
 28          RD    2650   0.022   0.013            CIRC     3.0

 29          KK  B9
 30          KM   PIKES PEAK COMMUNITY COLLEGE BASIN
 31          BA   0.098
 32          LS             75
 33          UD    .114

 34          KK  B9OUT
 35          KM   ROUTE B9 THROUGH PIKES PEAK COLLEGE DETENTION BASIN
 36          RS       1    ELEV    6757
 37          SV       0     1.0    2.56    4.89    6.97
 38          SE    6757    6760    6762    6763    6764
 39          SQ       0    35.0    55.0    70.0     139

 40          KK  DP1
 41          KM    COMBINE B9OUT AND B-O1
 42          HC       2

 43          KK  B-9
 44          KM   ROUTE DP1 TO DP2
 45          RD    1375    .012    .013            CIRC     3.5
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 46          KK  B10
 47          KM
 48          BA    .024
 49          LS             68
 50          UD    .126

 51          KK  O2B
 52          KM   OFFSITE BASIN O2B PER DMJM PHASE II
 53          BA     .07
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54          LS              60
55          UD    .170

56          KK  O2B-1
57          KM   ROUTE O2B TO DP2
58          RD    3475   0.030   0.035            TRAP     6.0   3.0

59          KK  B8
60          KM   NEW LIFE CHURCH BASIN
61          BA    .063
62          LS              80
63          UD    .138

64          KK  B8OUT
65          KM    ROUTE B8 THROUGH NEW LIFE CHURCH DETENTON BASIN
66          RS       1    ELEV    6736
67          SV       0     .65    1.43    2.11    3.30    4.41
68          SE    6736    6737    6738    6739    6740    6741
69          SQ       0     4.3    14.0    22.0    28.0    31.0

70          KK    DP2
71          KM   COMBINE B8OUT, B10, B-9 AND O2B-1
72          HC       4

73          KK   B-9A
74          KM    ROUTE DP2 TO DP 2A (6 X 2 CBC EQUIVALENT)
75          RD     250    .005    .013            CIRC      4

76          KK    B-8
77          KM   ROUTE TO B-8 TO DP3  54-INCH RCP
78          RD    1670    .025    .013            CIRC      4.5

79          KK      B7
80          KM   SUB-BASIN B7, NORTH PORTION OF INTERQUEST FILING NO. 3
81          BA    .020
82          LS              88
83          UD    .152

84          KK   DP3
85          KM   COMBINE B-8 AND BASIN B7
86          HC       2
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LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

87          KK    B-7
88          KM   ROUTE DP3 TO DP4  54-INCH RCP
89          RD     550    .015    .013            CIRC      4.5

90          KK   B7A
91          KM    SOUTH PORTION OF INTERQUEST FILING NO. 3
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 92          BA    .029
 93          LS              88
 94          UD    .152

 95          KK   DP4
 96          KM   COMBINE BASIN B7A AND B-7
 97          HC       2

 98          KK   B-7A
 99          KM   ROUTE DP4 TO DP4A 60-INCH RCP
100          RD     150    .015    .013            CIRC      5.0

101          KK   B6
102          KM    INTERQUEST FILING NO. 2
103          BA    .028
104          LS              88
105          UD    .158

106          KK   B-6
107          KM   ROUTE SUB-BASIN B6 TO DP 4A  42-INCH RCP
108          RD     150    .015    .013            CIRC      3.5

109          KK   DP4A
110          KM   COMBINE B6 AND B-7A
111          HC       2

112          KK    B-5
113          KM   ROUTE TO DP4A TO DP 5 60-INCH RCP
114          RD    1150    .024    .013            CIRC      5.0

115          KK     B4A
116          KM   SUB-BASIN B4A
117          BA    .011
118          LS              88
119          UD    .158

120          KK    DP5
121          KM   COMBINE B4A AND B-5
122          HC       2

123          KK    B-5A
124          KM   ROUTE TO DP5 TO DP 6 60-INCH RCP
125          RD     650    .020    .013            CIRC       5
1                                        HEC-1 INPUT                                        PAGE  4

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

126          KK      B5
127          KM    SUB-BASIN B5
128          BA    .032
129          LS              88
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130          UD    .141

131          KK      B3
132          KM    SUB-BASIN B3
133          BA    .027
134          LS              88
135          UD    .150

136          KK    B-4
137          KM    ROUTE TO B3 TO DP5A 36 -INCH RCP
138          RD     650    .010    .013            CIRC       3

139          KK      B4
140          KM    SUB-BASIN B4
141          BA    .014
142          LS              88
143          UD    .119

144          KK    DP5A
145          KM    COMBINE B-4 AND B4
146          HC       2

147          KK    B-2
148          KM    ROUTE TO DP5A TO DP6 42-INCH RCP
149          RD     680    .010    .013            CIRC      3.5

150          KK      B2
151          KM    SUB-BASIN B2
152          BA    .009
153          LS              88
154          UD    .083

155          KK     DP6
156          KM    COMBINE B-5A, B5, B-2 AND B2
157          HC       4

158          KK    B-1
159          KM    ROUTE TO DP6 TO DP8  66-INCH RCP
160          RD    1000    .025    .013            CIRC      5.5

161          KK      B2A
162          KM    SUB-BASIN B2A
163          BA    .016
164          LS              88
165          UD    .133
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

166          KK    B-2A
167          KM    ROUTE B2A TO DP7  30-INCH RCP
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168          RD     600     .020     .013             CIRC        3

169          KK       B1
170          KM    SUB-BASIN B1
171          BA    .017
172          LS               88
173          UD    .120

174          KK     DP7
175          KM   COMBINE B1 AND B-2A
176          HC       2

177          KK    B-2B
178          KM   ROUTE DP7 TO DP 8, DETETNION BASIN A  48-INCH RCP
179          RD    1000     .004    .013             CIRC        4

180          KK       B1A
181          KM    SUB-BASIN B1A DIRECT FLOW TO DP 8 DETENTION BASIN A
182          BA    .021
183          LS               88
184          UD    .141

185          KK       B1B  DIRECT FLOW TO DP 8, DETENTION BASIN A
186          KM   SUB-BASIN B1B
187          BA    .014
188          LS               88
189          UD    .107

190          KK       A3
191          KM   SUB-BASIN A3
192          BA    .089
193          LS               88
194          UD    .230

195          KK    A-3
196          KM   ROUTE SUB-BASIN A3 TO DP10  48-INCH RCP
197          RD    1800   0.018   0.013             CIRC        4

198          KK       A5
199          KM   SUB-BASIN A5
200          BA   0.164
201          LS               88
202          UD    .250

203          KK    DP10
204          KM   COMBINE A-3 AND A5
205          HC       2
1                                        HEC-1 INPUT                                        PAGE  6

          LINE       ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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206          KK    A-7
207          KM   ROUTE DP10 TO DP 12
208          RD    1100    .005    .015            TRAP       6     1.5

209          KK      A7
210          KM   SUB-BASIN A7
211          BA    .039
212          LS              68
213          UD    .140

214          KK    C
215          KM   SUB-BASIN C
216          BA    .043
217          LS              68
218          UD    .160

219          KK    D-1
220          KM     ROUTE SUB-BASIN C TO DP 11  30" RCP
221          RD    2400    .020    .013            CIRC       4     2.5

222          KK      D
223          KM   SUB-BASIN D
224          BA    .063
225          LS              85
226          UD    .200

227          KK   DOUT
228          KM   DETENTION BASIN D OUTFLOW
229          RS       1    ELEV    6689
230          SV       0     .01     .30     .90    1.68    2.68    3.28
231          SE    6689    6690    6692    6694    6696    6698    6699
232          SQ       0       0    22.0    70.0     110     140     150

233          KK   DP11
234          KM    COMBINE D-1 AND DOUT
235          HC       2

236          KK   A-7A
237          KM   ROUTE DP11 TO DP12
238          RD    1050    .020    .013            CIRC       4

239          KK    DP12
240          KM   COMBINE A-7A, A7, AND A-7
241          HC       3

242          KK   A-8
243          KM   ROUTE DP12 TO DP8, DETENTION BASIN A
244          RD    3200    .020    .015            TRAP       6     1.5
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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245          KK    A4
246          KM    SUB-BASIN A4, DIRECT FLOW TO DP8, DETENTION BASIN A
247          BA    .037
248          LS              74
249          UD    .162

250          KK   A1
251          KM    SUB-BASIN A1
252          BA    .039
253          LS              88
254          UD    .223

255          KK   A-1
256          KM    ROUTE A1 TO DP 13  30-INCH RCP
257          RD     800    .013    .013            CIRC     2.5

258          KK   A2
259          KM    SUB-BASIN A2  INTERQUEST FILING NO. 1
260          BA    .043
261          LS              88
262          UD    .212

263          KK    DP13
264          KM    COMBINE A2 AND A-1
265          HC       2

266          KK   A-2
267          KM    ROUTE DP13 TP DP8. DETENTION BASIN A
268          RD     500    .030    .013            CIRC     4.0

269          KK   A6
270          KM   SUB-ASIN A6, DIRECT FLOW TO DP8. DETENTION BASIN A
271          BA    .054
272          LS              76
273          UD    .263

274          KK   A8
275          KM   SUB-BASIN A8 FAIRLANE TECH PARK NO. 3
276          BA    .029
277          LS              88
278          UD    .237

279          KK   A-8A
280          KM    ROUTE A8 TO DP 8, DETENTION BASIN A
281          RD     520    .020    .035            TRAP     6.0    3.0

282          KK   DP 8
283          KM    INFLOW TO DETENTION BASIN A
284          HC       9
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 285          KK  DP8OUT
 286          KM   DETENTION BASIN A OUTFLOW WITH NO MODIFICATIONS
 287          RS       1    ELEV    6614
 288          SV       0    0.84    7.06   19.91   36.66   55.02   74.87   96.98  112.72
 289          SE    6614    6616    6618    6620    6622    6624    6626    6628    6630
 290          SQ       0      16      39      52     125     150     170     170     170

 291          KK   A-12
 292          KM    ROUTE DP8OUT TO DP14
 293          RD     700    .010    .035            TRAP    20.0     2.0

 294          KK   A12
 295          KM   SUB-BASIN A12, AFA DIRECT FLOW TO DP14
 296          BA    .036
 297          LS              70
 298          UD    .400

 299          KK   DP 14
 300          KM    COMBINE A-12 AND A12
 301          HC       2

 302          KK   E1
 303          KM   SUB-BASIN E1
 304          BA    .026
 305          LS              88
 306          UD    .20

 307          KK   E1OUT
 308          KM    DETENTION BASIN E1A
 309          RS       1    ELEV    6620
 310          SV       0     .65    1.43    2.11    3.30    4.41
 311          SE    6620    6621    6622    6623    6624    6625
 312          SQ       0     2.3     6.0    10.0    15.0    20.0

 313          KK   E-1
 314          KM    ROUTE DETTENION BASIN E1OUT TO DP 15
 315          RD     900    .020    .035            TRAP    10.0     2.0

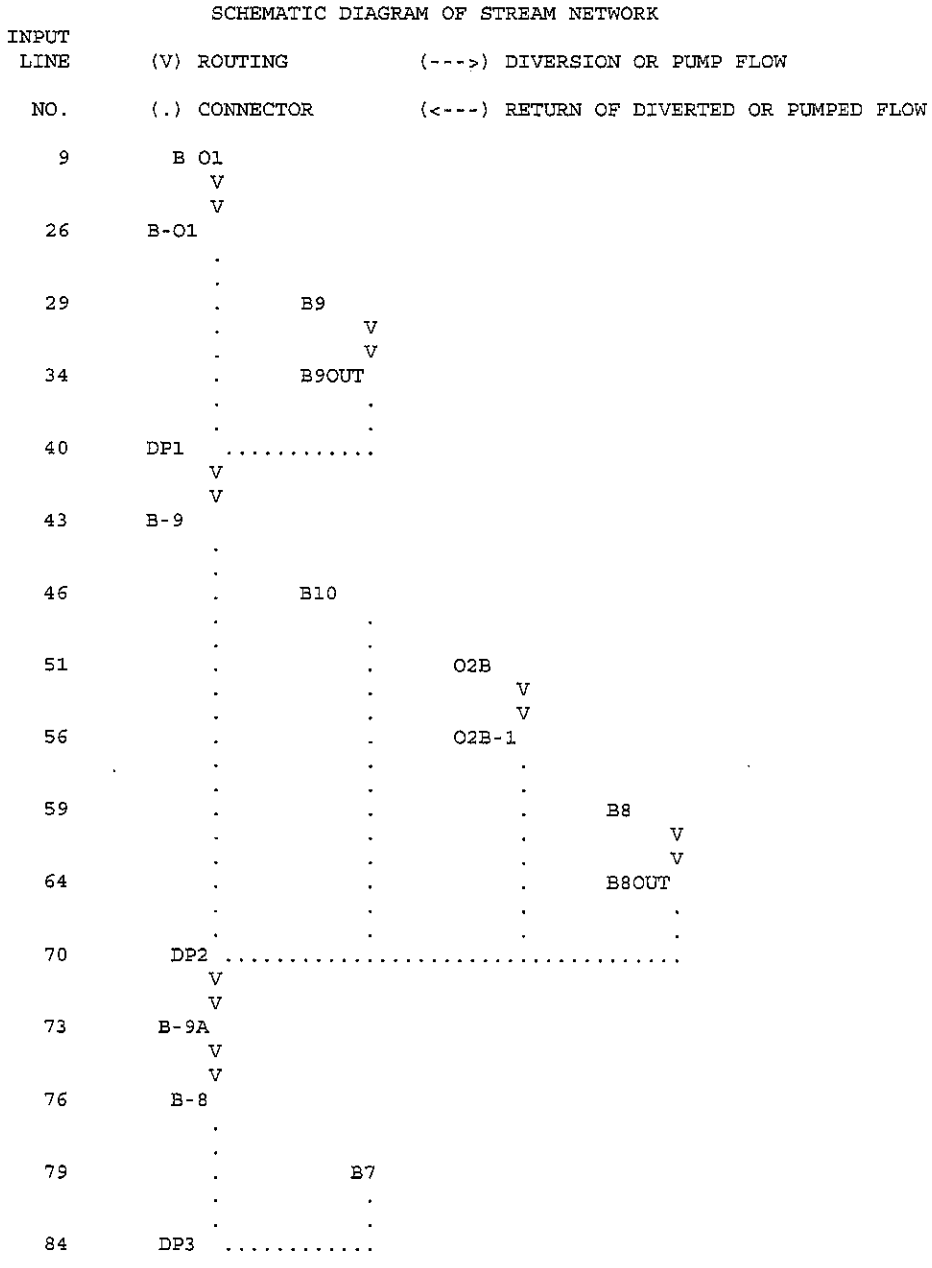
 316          KK   E2
 317          KM   SUB-BASIN E2   AFA DIRECT FLOW TO DP15
 318          BA    .053
 319          LS              70
 320          UD    .400

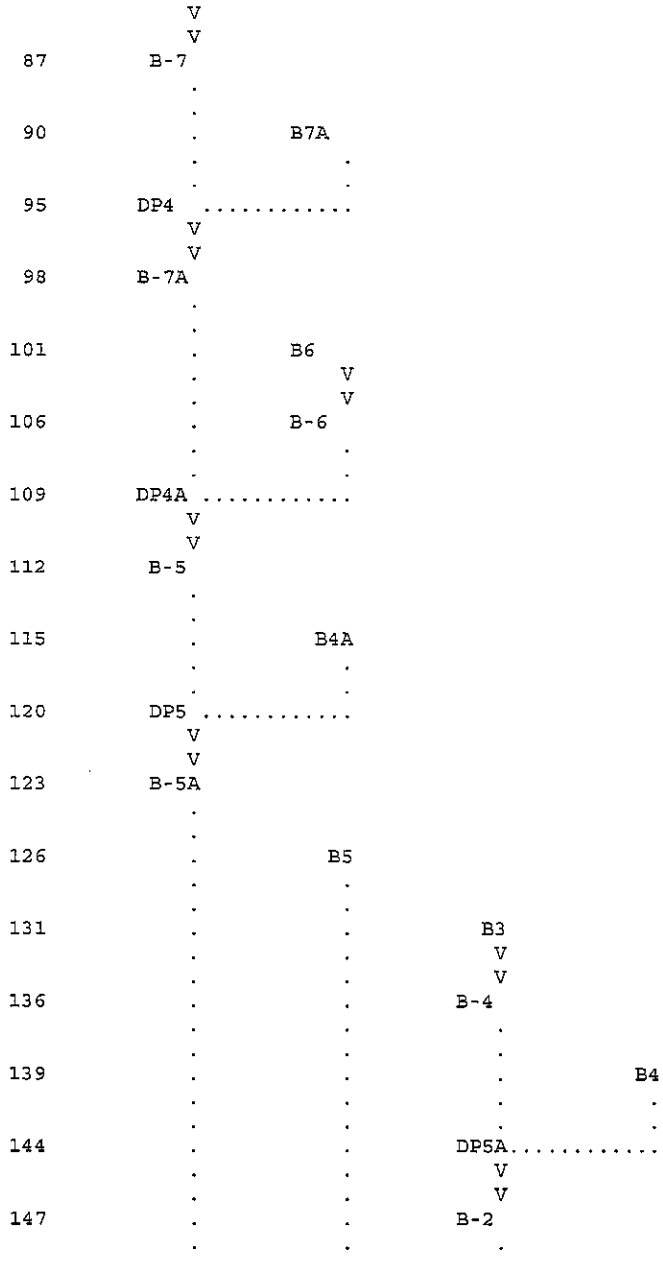
 321          KK   DP 15
 322          KM    COMBINE E-1 AND E2
 323          HC       2
 324          ZZ
```

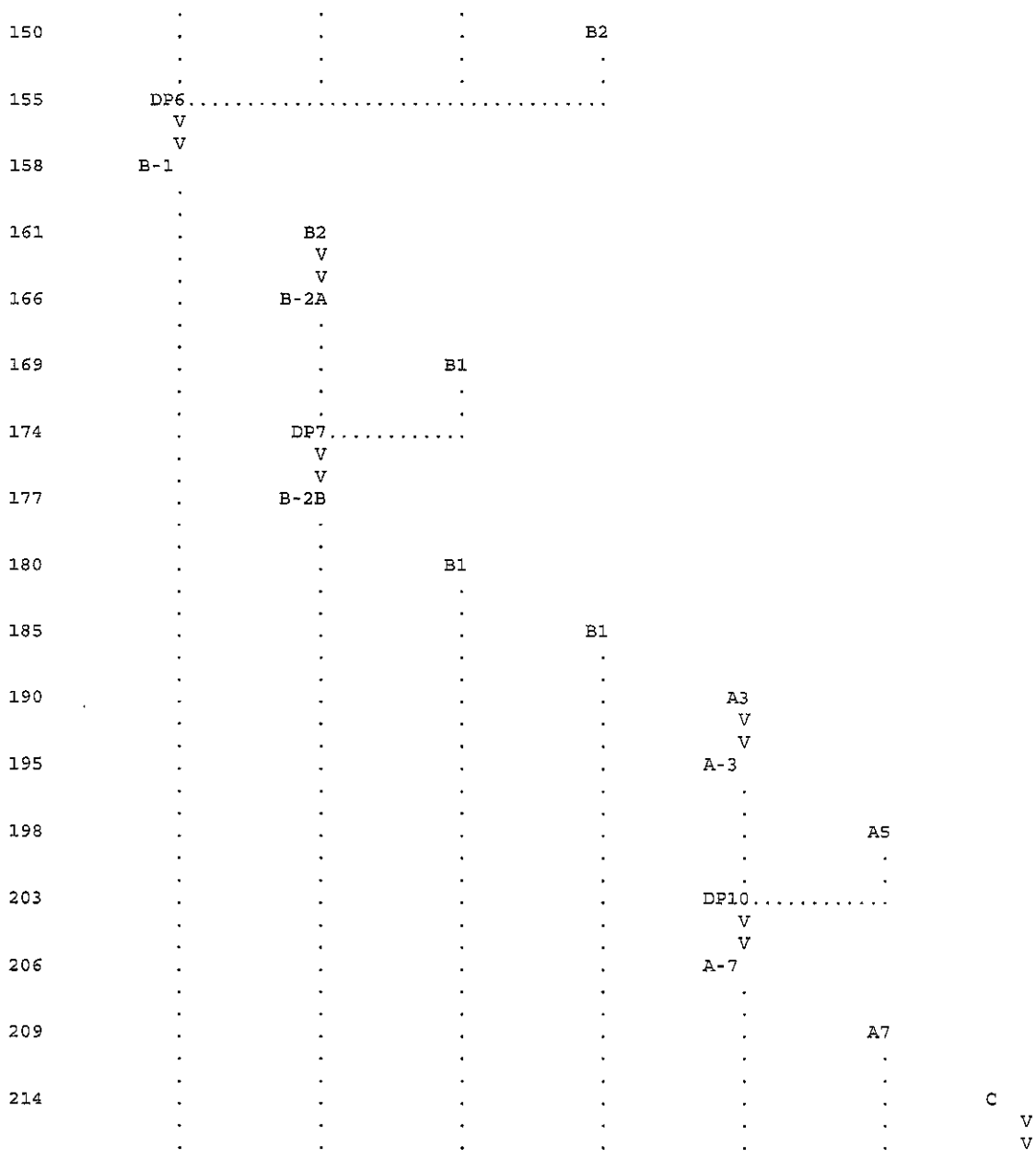
SCHEMATIC DIAGRAM OF STREAM NETWORK

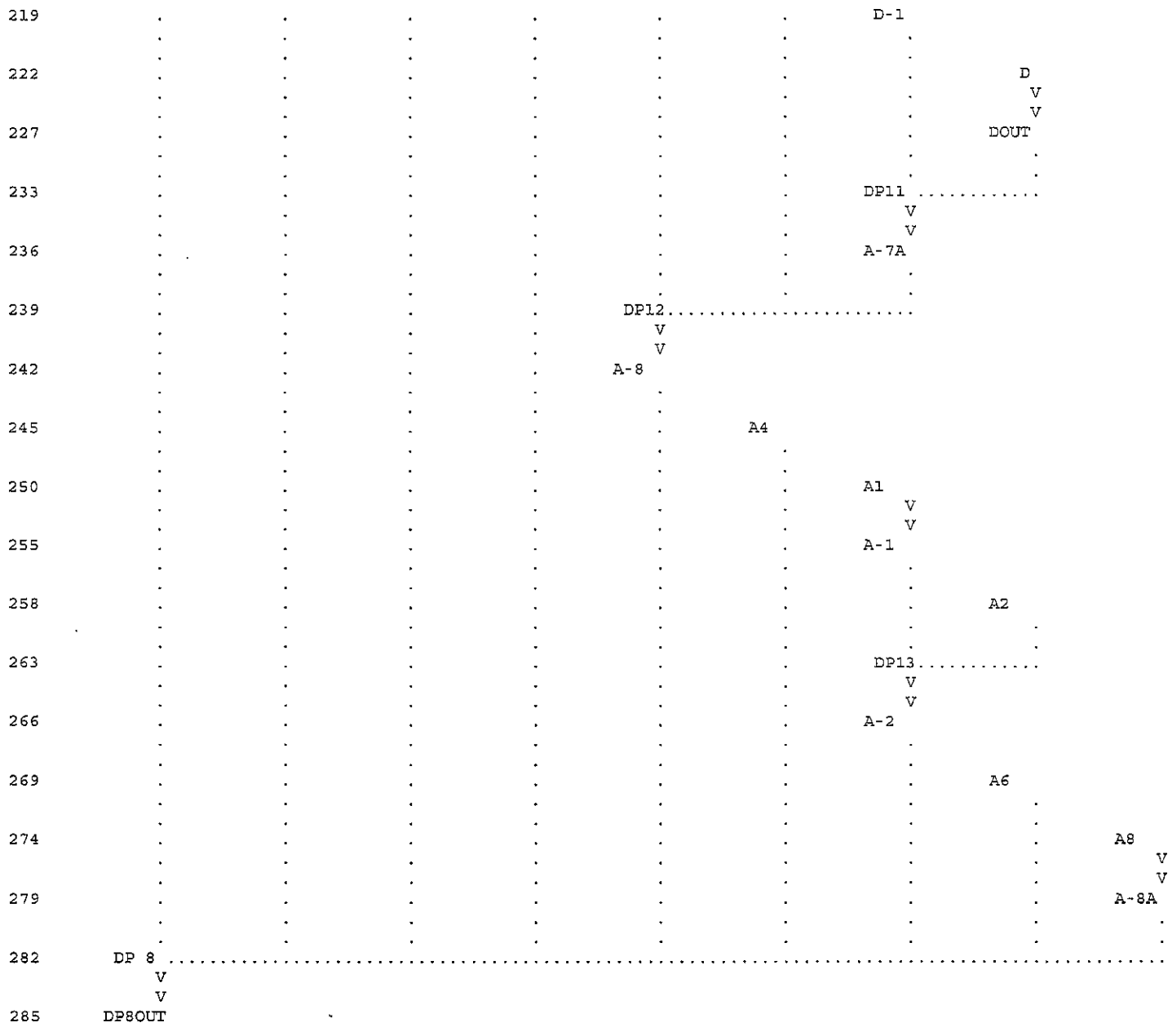
INPUT LINE NO.

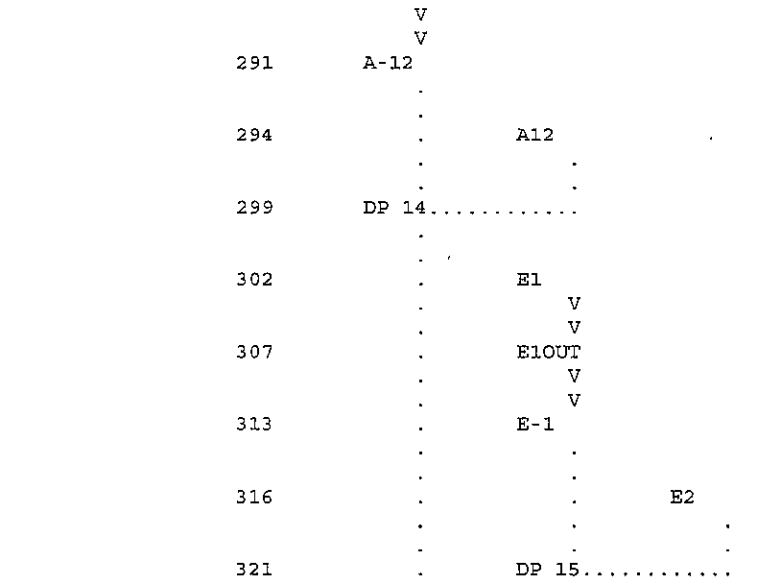
(V) ROUTING
(.) CONNECTOR
(---->) DIVERSION OR PUMP FLOW
(<----) RETURN OF DIVERTED OR PUMPED FLOW




87
B-7
90
B7A
95
DP4
98
B-7A
101
B6
106
B-6
109
DP4A
112
B-5
115
B4A
120
DP5
123
B-5A
126
B5
131
B3
136
B-4
139
B4
144
DP5A
147
B-2


150
B2
155
DP6
158
B-1
161
B2
166
B-2A
169
B1
174
DP7
177
B-2B
180
B1
185
B1
190
A3
195
A-3
198
A5
203
DP10
206
A-7
209
A7
214
C


219
D-1
222
D
V
V
227
DOUT
233
DP11
V
V
236
A-7A
239
DP12
V
V
242
A-8
245
A4
250
A1
V
V
255
A-1
258
A2
263
DP13
V
V
266
A-2
269
A6
274
A8
V
V
279
A-8A
282
DP 8
V
V
285
DP8OUT



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   08FEB01  TIME  11:28:18   *
*                                       *
*****************************************
```

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

```
HEC-1
FAIRLANE TECHNOLOGICAL PARK MDDP UPDATE
KIOWA ENGINEERING CORPORATION  JOB NO. 00084
DEVELOPED HYDROLOGY 2, 5, 10, 25, 50 AND 100-YEAR STORMS, 24 HOUR DURATION
FILENAME FT100A.DAT  ALTERATIONS TO EX DETENTION BASIN A:  RAISE 3.8'

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

    IT          HYDROGRAPH TIME DATA
```

NMIN		3	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		300	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		1457	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .05 HOURS
TOTAL TIME BASE 14.95 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.48 .56 .73 .82 .91 1.00

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .48	RATIO 2 .56	RATIO 3 .73	RATIO 4 .82	RATIO 5 .91	RATIO 6 1.00
HYDROGRAPH AT										
+	B O1	.03	1	FLOW	7.	12.	25.	33.	41.	50.
				TIME	6.05	6.05	6.00	6.00	6.00	6.00
ROUTED TO										
+	B-O1	.03	1	FLOW	7.	12.	25.	33.	41.	49.
				TIME	6.10	6.10	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	B9	.10	1	FLOW	45.	66.	115.	142.	171.	200.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
ROUTED TO										
+	B9OUT	.10	1	FLOW	21.	32.	46.	55.	59.	65.
				TIME	6.20	6.15	6.20	6.20	6.20	6.20

			** PEAK STAGES IN FEET **							
			1	STAGE	6758.81	6759.76	6761.14	6761.95	6762.30	6762.64
				TIME	6.20	6.15	6.20	6.20	6.20	6.20
2 COMBINED AT										
+	DP1	.13	1	FLOW	26.	42.	67.	81.	95.	108.
				TIME	6.15	6.10	6.10	6.10	6.05	6.05
ROUTED TO										
+	B-9	.13	1	FLOW	27.	42.	67.	80.	94.	107.
				TIME	6.15	6.15	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	B10	.02	1	FLOW	5.	9.	18.	24.	30.	37.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	O2B	.07	1	FLOW	2.	6.	23.	34.	47.	60.
				TIME	6.15	6.15	6.10	6.10	6.10	6.10
ROUTED TO										
+	O2B-1	.07	1	FLOW	2.	5.	22.	33.	45.	60.
				TIME	6.55	6.40	6.25	6.25	6.20	6.20
HYDROGRAPH AT										
+	B8	.06	1	FLOW	40.	55.	90.	109.	128.	148.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
ROUTED TO										
+	B8OUT	.06	1	FLOW	8.	13.	23.	25.	28.	30.
				TIME	6.35	6.30	6.30	6.30	6.30	6.35
			** PEAK STAGES IN FEET **							
			1	STAGE	6737.38	6737.85	6739.09	6739.56	6740.08	6740.67
				TIME	6.35	6.30	6.30	6.30	6.30	6.35
4 COMBINED AT										
+	DP2	.28	1	FLOW	37.	58.	106.	140.	173.	207.
				TIME	6.15	6.15	6.20	6.15	6.15	6.10
ROUTED TO										
+	B-9A	.28	1	FLOW	36.	58.	105.	139.	172.	206.
				TIME	6.15	6.15	6.20	6.15	6.15	6.10
ROUTED TO										
+	B-8	.28	1	FLOW	36.	57.	105.	137.	172.	205.
				TIME	6.20	6.15	6.25	6.20	6.15	6.15
HYDROGRAPH AT										
+	B7	.02	1	FLOW	21.	26.	38.	45.	52.	58.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05

2 COMBINED AT										
+	DP3	.31	1	FLOW	50.	76.	133.	167.	209.	252.
				TIME	6.15	6.15	6.10	6.15	6.15	6.10
ROUTED TO										
+	B-7	.31	1	FLOW	50.	76.	132.	167.	209.	249.
				TIME	6.15	6.15	6.10	6.15	6.15	6.10
HYDROGRAPH AT										
+	B7A	.03	1	FLOW	30.	38.	56.	65.	75.	84.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
2 COMBINED AT										
+	DP4	.33	1	FLOW	75.	108.	183.	223.	272.	325.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	B-7A	.33	1	FLOW	74.	108.	183.	223.	272.	325.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	B6	.03	1	FLOW	29.	36.	53.	62.	72.	81.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
ROUTED TO										
+	B-6	.03	1	FLOW	28.	36.	53.	62.	72.	81.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
2 COMBINED AT										
+	DP4A	.36	1	FLOW	101.	142.	232.	281.	338.	399.
				TIME	6.10	6.10	6.10	6.05	6.10	6.10
ROUTED TO										
+	B-5	.36	1	FLOW	100.	141.	232.	281.	337.	398.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	B4A	.01	1	FLOW	11.	14.	21.	25.	28.	32.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
2 COMBINED AT										
+	DP5	.37	1	FLOW	110.	154.	252.	304.	362.	427.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	B-5A	.37	1	FLOW	109.	153.	251.	303.	361.	425.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	B5	.03	1	FLOW	34.	43.	62.	73.	83.	94.
				TIME	6.05	6.05	6.05	6.05	6.00	6.00

HYDROGRAPH AT										
+	B3	.03	1	FLOW	28.	35.	52.	61.	70.	79.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
ROUTED TO										
+	B-4	.03	1	FLOW	28.	35.	52.	61.	69.	78.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	B4	.01	1	FLOW	15.	19.	28.	33.	38.	43.
				TIME	6.00	6.00	6.00	6.00	6.00	6.00
2 COMBINED AT										
+	DP5A	.04	1	FLOW	43.	54.	79.	93.	106.	120.
				TIME	6.05	6.05	6.05	6.05	6.05	6.00
ROUTED TO										
+	B-2	.04	1	FLOW	42.	54.	79.	92.	106.	119.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	B2	.01	1	FLOW	10.	13.	19.	22.	25.	28.
				TIME	6.00	6.00	6.00	6.00	6.00	6.00
4 COMBINED AT										
+	DP6	.45	1	FLOW	188.	252.	402.	482.	563.	651.
				TIME	6.05	6.05	6.05	6.05	6.05	6.05
ROUTED TO										
+	B-1	.45	1	FLOW	186.	249.	397.	477.	559.	645.
				TIME	6.10	6.10	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	B2	.02	1	FLOW	17.	21.	31.	37.	42.	48.
				TIME	6.05	6.05	6.00	6.00	6.00	6.00
ROUTED TO										
+	B-2A	.02	1	FLOW	17.	21.	31.	37.	42.	47.
				TIME	6.05	6.05	6.05	6.05	6.05	6.00
HYDROGRAPH AT										
+	B1	.02	1	FLOW	18.	23.	34.	40.	46.	52.
				TIME	6.05	6.00	6.00	6.00	6.00	6.00
2 COMBINED AT										
+	DP7	.03	1	FLOW	35.	44.	65.	76.	87.	99.
				TIME	6.05	6.05	6.00	6.00	6.00	6.00
ROUTED TO										
+	B-2B	.03	1	FLOW	34.	44.	64.	75.	86.	97.
				TIME	6.10	6.05	6.05	6.05	6.05	6.05

HYDROGRAPH AT										
+	B1	.02	1	FLOW	22.	28.	41.	48.	55.	62.
				TIME	6.05	6.05	6.05	6.05	6.00	6.00
HYDROGRAPH AT										
+	B1	.01	1	FLOW	15.	20.	29.	33.	38.	43.
				TIME	6.00	6.00	6.00	6.00	6.00	6.00
HYDROGRAPH AT										
+	A3	.09	1	FLOW	79.	102.	151.	178.	205.	232.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	A-3	.09	1	FLOW	78.	100.	150.	176.	203.	231.
				TIME	6.15	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	A5	.16	1	FLOW	139.	180.	269.	318.	366.	416.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
2 COMBINED AT										
+	DP10	.25	1	FLOW	217.	280.	419.	494.	570.	647.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	A-7	.25	1	FLOW	217.	278.	414.	486.	563.	640.
				TIME	6.15	6.15	6.15	6.10	6.10	6.10
HYDROGRAPH AT										
+	A7	.04	1	FLOW	8.	13.	28.	38.	47.	58.
				TIME	6.10	6.05	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	C	.04	1	FLOW	8.	14.	29.	39.	49.	60.
				TIME	6.10	6.10	6.10	6.05	6.05	6.05
ROUTED TO										
+	D-1	.04	1	FLOW	8.	13.	29.	39.	49.	60.
				TIME	6.15	6.15	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	D	.06	1	FLOW	49.	64.	98.	117.	137.	157.
				TIME	6.10	6.10	6.10	6.05	6.05	6.05
ROUTED TO										
+	DOUT	.06	1	FLOW	39.	52.	79.	92.	106.	117.
				TIME	6.20	6.20	6.20	6.20	6.20	6.20
			**	PEAK STAGES IN FEET **						
			1	STAGE	6692.72	6693.26	6694.44	6695.10	6695.81	6696.47
				TIME	6.20	6.20	6.20	6.20	6.20	6.20

2 COMBINED AT										
+	DP11	.11	1	FLOW	46.	65.	106.	128.	151.	171.
				TIME	6.20	6.15	6.15	6.15	6.15	6.15
ROUTED TO										
+	A-7A	.11	1	FLOW	46.	64.	105.	127.	150.	171.
				TIME	6.20	6.20	6.15	6.15	6.15	6.15
3 COMBINED AT										
+	DP12	.40	1	FLOW	268.	351.	540.	643.	752.	860.
				TIME	6.15	6.15	6.15	6.10	6.10	6.10
ROUTED TO										
+	A-8	.40	1	FLOW	265.	347.	537.	640.	747.	855.
				TIME	6.20	6.20	6.15	6.15	6.15	6.15
HYDROGRAPH AT										
+	A4	.04	1	FLOW	13.	20.	37.	46.	57.	67.
				TIME	6.10	6.10	6.05	6.05	6.05	6.05
HYDROGRAPH AT										
+	A1	.04	1	FLOW	35.	45.	67.	79.	91.	103.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	A-1	.04	1	FLOW	35.	45.	67.	78.	90.	102.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	A2	.04	1	FLOW	40.	51.	75.	88.	101.	115.
				TIME	6.10	6.10	6.10	6.10	6.05	6.05
2 COMBINED AT										
+	DP13	.08	1	FLOW	74.	95.	141.	166.	191.	216.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	A-2	.08	1	FLOW	74.	95.	141.	166.	191.	216.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
HYDROGRAPH AT										
+	A6	.05	1	FLOW	18.	27.	48.	60.	73.	87.
				TIME	6.15	6.15	6.15	6.15	6.15	6.15
HYDROGRAPH AT										
+	A8	.03	1	FLOW	25.	33.	49.	57.	66.	75.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	A-8A	.03	1	FLOW	25.	32.	48.	57.	66.	74.
				TIME	6.15	6.15	6.10	6.10	6.10	6.10

9 COMBINED AT										
+	DP 8	1.12	1	FLOW	610.	820.	1294.	1549.	1817.	2091.
				TIME	6.10	6.10	6.10	6.10	6.10	6.10
ROUTED TO										
+	DP8OUT	1.12	1	FLOW	71.	106.	147.	160.	170.	170.
				TIME	7.10	6.95	7.05	7.15	6.70	6.40
			** PEAK STAGES IN FEET **							
			1	STAGE	6620.53	6621.48	6623.75	6625.01	6626.29	6627.58
				TIME	7.10	6.95	7.05	7.15	7.25	7.40
ROUTED TO										
+	A-12	1.12	1	FLOW	71.	106.	147.	160.	170.	170.
				TIME	7.15	7.00	7.10	7.20	6.80	6.55
HYDROGRAPH AT										
+	A12	.04	1	FLOW	5.	8.	16.	22.	28.	34.
				TIME	6.35	6.30	6.30	6.30	6.30	6.30
2 COMBINED AT										
+	DP 14	1.16	1	FLOW	73.	109.	153.	170.	185.	200.
				TIME	7.05	6.90	6.55	6.45	6.45	6.40
HYDROGRAPH AT										
+	E1	.03	1	FLOW	24.	31.	46.	54.	63.	71.
				TIME	6.10	6.10	6.05	6.05	6.05	6.05
ROUTED TO										
+	E1OUT	.03	1	FLOW	3.	4.	7.	9.	10.	12.
				TIME	6.65	6.60	6.55	6.55	6.55	6.50
			** PEAK STAGES IN FEET **							
			1	STAGE	6621.23	6621.55	6622.28	6622.71	6623.09	6623.35
				TIME	6.65	6.65	6.55	6.55	6.50	6.50
ROUTED TO										
+	E-1	.03	1	FLOW	3.	4.	7.	9.	10.	12.
				TIME	6.75	6.70	6.65	6.60	6.55	6.55
HYDROGRAPH AT										
+	E2	.05	1	FLOW	7.	11.	24.	32.	41.	50.
				TIME	6.35	6.30	6.30	6.30	6.30	6.30
2 COMBINED AT										
+	DP 15	.08	1	FLOW	9.	15.	30.	40.	50.	61.
				TIME	6.40	6.35	6.30	6.30	6.30	6.30

1

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