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HYDRAULIC ANALYSIS FOR TENTH STREET WASH DETENTION BASIN NO. 1 PROPOSED RECREATIONAL IMPROVEMENTS

THE POINT TAPATIO CLIFFS RESORT CONDOMINIUM HOMEOWNERS ASSOCIATION

c/o America's Direct
1440 East Missouri, Suite 225
Phoenix, Arizona 85014

November 1996

STANLEY CONSULTANTS

2929 E. Camelback Road
Suite 130
Phoenix, Arizona 85016
(602) 912-6500

SCI Project No. 13160

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
26837
G. SCOTT
BUCHANAN
Date Signed 11-4-96
ARIZONA, U.S.A.

STANLEY CONSULTANTS

2929 E. Camelback Road
Suite 130
Phoenix, Arizona 85016
(602) 912-6500

SCI Project No. 13160

STANLEY CONSULTANTS, INC.

2929 East Camelback Road, Suite 130 • Phoenix, AZ 85016-4425 Tel: 602/912-6500 • Fax: 602/912-6599

November 4, 1996

Mr. Michael Lopez, P.E.
FLOOD CONTROL DISTRICT OF
MARICOPA COUNTY
2801 W. Durango
Phoenix, Arizona 85009

RE: The Pointe Tapatio Cliffs Resort Condominium
Tenth Street Wash Detention Basin No. 1
Proposed Recreational Improvements

Dear Mr. Lopez:

Presented here is an analysis of the potential hydrologic impact of the proposed recreational improvements within Tenth Street Wash Detention Basin No. 1. I have simply taken the HEC-1 model for the 100-year, 6-hour storm which we had used in the detention basin design and modified the storage portion of the elevation-storage-discharge relationship. All volumes above and including elevation 1309.0 have been decreased by a volume by 0.14 acre feet to account for the loss in storage due to the proposed recreational improvements. Enclosed is a calculation sheet showing how the volume was derived.

The proposed improvements include a tennis court with associated fencing and lighting, a sport court with basketball backstop, 2 concrete picnic tables, 2 barbecue grills, a fire pit, a sidewalk and a stairway leading down into the detention basin. Transmitted with this analysis is a three sheet construction drawing for these improvements for your review. Also proposed are a thin surface treatment of decomposed granite around the picnic table area and a horseshoe pit where the future other half of the sport court will be. These latter two improvements are considered minor and are not reflected on the plan.

The results of the enclosed HEC-1 analysis indicate that the proposed recreational improvements would increase the ponded water surface elevation within the detention basin by only 0.02 feet. From a hydrologic standpoint, this is insignificant. The peak discharge downstream from the detention basin is unaffected by the loss in storage. Based on these results, I feel that it is unnecessary to compensate for the loss in storage by excavating and removing a like volume from the basin.

Please review this analysis and the enclosed plans and call me if you have any questions.

Sincerely,

STANLEY CONSULTANTS, INC.

G. Scott Buchanan

G. Scott Buchanan, P.E.
Project Manager

gsb/tlb:NOV005.60/13160

Enclosure

cc: Project Files (13160)

Registered Professional Engineer (Civil)
CERTIFICATE NO.
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G. SCOTT
BUCHANAN
Date Signed 11-4-96
ARIZONA, U.S.A.

STANLEY CONSULTANTS

Computed by GSB Date 11-1-96
Checked by _____ Date _____
Approved by _____ Date _____

Project No. 13160 Page No. _____
Subject PTRCHOA RECREATIONAL IMPROVEMENTS
Sheet No. 1 of 1

ESTIMATED DISPLACEMENT OF STORAGE VOLUME WITHIN 10TH STREET WASH DETENTION BASIN DUE TO PROPOSED RECREATIONAL IMPROVEMENTS BY THE POINTE TAPATIO CLIFFS RESORT CONDOMINIUM HOMEOWNERS ASSOCIATION:

PROPOSED TENNIS COURT:

$60' \times 120' \times 0.67' = 4824\ FT^3$

PROPOSED SPORT COURT (INCLUDING FUTURE)

$50' \times 94' \times 0.67 = 3149\ FT^3$

PROPOSED SIDEWALK:

$3' \times 145' \times 0.17 = 74\ FT^3$

PROPOSED STAIRWAY: $-0-\ FT^3$

PROPOSED TENNIS COURT FENCE, LIGHTING, BACKSTOP, PICNIC TABLES, BBQ GRILLS, DECOMPOSED GRANITE AND OTHER MISC ABOVE GROUND ITEMS:

$= 1500\ FT^3$

TOTAL $9547\ FT^3$

$= 0.22\ ACFT$

NOTE: ALL PROPOSED IMPROVEMENTS OCCUR @ ELEV. 1309.0 OR ABOVE.

FROM THE TOTAL ABOVE, SUBTRACT THE VOLUME ENCOMPASSED BY THE HEADWALL/WINGWALLS OF THE TWO BASIN INLETS WHICH HAD NOT BEEN ACCOUNTED FOR IN THE ORIGINAL BASIN DESIGN COMPUTATIONS:

WEST – $(18.9'\ L \times 17.5'\ W \times 8'\ H) \times 0.5 = 1321\ FT^3$

EAST – $(29.5'\ L \times 17.5'\ W \times 8'\ H) \times 0.5 = 2065\ FT^3$

TOTAL $3386\ FT^3$

NET VOL ADJUSTMENT:

$9547\ FT^3 - 3386\ FT^3 = 6161\ FT^3$

$= (-)0.14\ AC\ FT$

ABOVE ELEV 1309.0

SC 3020R1 995

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  10/02/1996  TIME  18:13:55 *
*                                       *
*****************************************
```

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

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

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

WITHOUT RECREATIONAL IMPROVEMENTS

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

  1           ID
  2           ID        FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
  3           ID        TENTH STREET WASH DETENTION BASIN NO 1  (FCD 93-31)
  4           ID        STANLEY CONSULTANTS, INC.  (SCI JOB # 12183)
  5           ID        HEC-1 INPUT FILENAME :  12183H1D
  6           ID
  7           ID        ************************************************************************
  8           ID        THIS MODEL REPRESENTS THE PROPOSED 10TH STREET WASH DETENTION BASIN #1.
  9           ID        THE FOLLOWING IMPROVEMENTS ARE REFLECTED.
 10           ID          1. EAST TRIBUTARY (SUB-BASIN 141): 29' WEIR INLET AT CREST ELEV. 1321.
 11           ID             DIVERSION RECORDS REFLECT BYPASS OF LOW FLOWS THROUGH EXISTING 30"
 12           ID             CMP AND INLET RATING CURVE.
 13           ID          1. WEST TRIBUTARY (SUB-BASIN 142): 100' SIDE WEIR 3.34' ABOVE PROPOSED
 14           ID             FLOW LINE AT WEIR CREST ELEV. 1319.  DIVERSION RECORDS REFLECT LOW
 15           ID             FLOW BYPASS AND INLET RATING CURVE.
 16           ID          2. BASIN CONFIGURATION: 3:1 SLOPES ON 3 SIDES AND A VERTICAL RETAINING
 17           ID             WALL ON THE WEST SIDE, A BOTTOM ELEVATION (OUTLET INV. ELEV.) OF
 18           ID             1306.8, AND A HIGH WATER ELEV. 1319 WITH 1' FREEBOARD TO ELEV.
 19           ID             1320.
 20           ID          3. OUTLET CONFIGURATION: 30" RCP AT INV. ELEV. 1306.8 AS THE LOW FLOW
 21           ID             AND PRINCIPAL OUTLET, AND A 260' EMERGENCY WEIR AT CREST ELEV.
 22           ID             1318.3.
 23           ID        ************************************************************************
 24           ID
 25           ID        ************************************************************************
 26           ID        THIS HEC-1 MODEL IS BASED ON THE KAMINSKI-HUBBARD ACDC ADMS AS MODIFIED
 27           ID        BY FCD TO REFLECT TWO HYPOTHETICAL DETENTION BASINS (NUMBERS 1 AND 2).
 28           ID        THE DIFFERENCES BETWEEN THIS MODEL AND THE ORIGINAL MODEL TRANSMITTED
 29           ID        BY FCD TO SCI AT THE PROJECT KICKOFF MEETING ARE AS FOLLOWS:
 30           ID          1. USE OF THE HEC-1 DATA STORAGE SYSTEM OPTION HAS BEEN DELETED;
 31           ID          2. THE TWO HYPOTHETICAL DETENTION BASINS 1 AND 2 HAVE BEEN DELETED;
 32           ID          3. THE CROSS SECTIONAL AREA OF THE PRINCIPAL SPILLWAY OUTLET PIPE OF
 33           ID             THE EXISTING CITY OF PHOENIX DET BASIN NO. 3 HAS BEEN CHANGED FROM
 34           ID             4.91 SQFT (WHICH CORRESPONDS TO AN OUTLET PIPE DIAM OF 30") TO
 35           ID             1.36 SQFT CORRESPONDING TO THE 14" X 14" STEEL ORIFICE PLATE WHICH
 36           ID             WAS ORIGINALLY DESIGNED AND INSTALLED.
 37           ID        ************************************************************************
 38           ID
 39           ID   ACDC AREA DRAINAGE MASTER STUDY
 40           ID   10TH STREET WASH WATERSHED
 41           ID   FILENAME:  TEN36.DAT     KHE JOB NO. 0146
 42           ID   100-YEAR 6-HOUR DURATION STORM
              *
              *  Based on FCDMC comments dated March 17, 1992 we adjusted the Mannings "n"
              *  coefficient to reflect weighted averaging in lieu of log averaging.
              *  We also changed the S-graph from Phoenix Mountain to Phoenix Valley.
              *
              *DIAGRAM
 43           IT       3                    300
 44           IO       5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 45           KK    140S
 46           KM   RUNOFF GENERATED ON SUB-BASIN 140
 47           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 48           KM    L= 1.22 mi.  Lca= 0.51 mi.  S= 162 ft/mi.  Kn= .050  LAG= 22.87 min.
 49           KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 50           BA    .516
 51           IN      15
 52           KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
 53           KM   AN AREAL REDUCTION COEFFICIENT OF .975 WAS USED
 54           PB  2.9200
 55           KM   THE FOLLOWING PC RECORD USED A 6-HOUR RAINFALL WITH PATTERN NO. 2.01
 56           PC    .000    .009    .016    .025    .034    .042    .051    .059    .067    .076
 57           PC    .087    .100    .120    .163    .252    .451    .694    .837    .900    .938
 58           PC    .950    .963    .975    .988   1.000
 59           LG    .145    .339   4.25    .488   20.44
 60           UI     76.    119.    294.    391.    468.    577.    793.    930.    712.    588.
 61           UI    474.    381.    274.    154.    127.     90.     76.     26.     23.     23.
 62           UI     23.     23.      0.      0.      0.      0.      0.      0.      0.      0.
 63           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 64           KK   DT140
 65           KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.0 AC-FT FROM SUB-BASIN 140
 66           KM                                               (Hydrograph identified as OR140)
 67           KM                                            2) Balance of runoff continues on.
 68           KM                                               (Hydrograph identified as DT140)
 69           DT   OR140     2.0
 70           DI       0   10000
 71           DQ       0   10000
 72           KM   ******************************************************************************
 73           KM     KK 140RR
 74           KM     KM ROUTE FLOW THROUGH NORTH MOUNTAIN DETENTION NO.3
 75           KM     RS      1    ELEV    55.9
 76           KM     SV      0     .06    1.52    6.32   17.42   35.46   60.34   95.64
 77           KM     SE   55.9      58      62      66      70      74      78      82
 78           KM     SL  57.15    4.91      .6      .5
 79           KM       ***********************************************************************
 80           KM     THE SL RECORD (LOW-LEVEL OUTLET) SECOND FIELD (ORIFICE AREA) VALUE HAS
 81           KM     BEEN CHANGED BY SCI FROM 4.91 sq.ft. TO 1.36 sq.ft. (14"x14" INLET)
 82           KM       ***********************************************************************
 83           KM     SS 79.66     100     3.0     1.5
 84           KM   ******************************************************************************

 85           KK   140RR
 86           KM   ROUTE FLOW THROUGH NORTH MOUNTAIN DETENTION NO.3
 87           RS       1    ELEV    55.9
 88           SV       0     .06    1.52    6.32   17.42   35.46   60.34   95.64
 89           SE    55.9      58      62      66      70      74      78      82
 90           SL   56.43    1.36      .6      .5
 91           SS   80.00     100     3.0     1.5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  92          KK   RM140
  93          KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM DETENTION BASIN THROUGH SUB-BASIN 141
  94          KM            1) Reach Length = 3600 ft.
  95          RD
  96          RC    .045    .045    .045    3600   .0108
  97          RX       0       0    46.5    76.4    79.9   110.2   160.2   160.2
  98          RY      16    12.6     7.3       0       0     9.9    15.9      16

  99          KK    141S
 100          KM   RUNOFF GENERATED ON SUB-BASIN 141
 101          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 102          KM    L= 0.83 mi.  Lca= 0.57 mi.  S= 315 ft/mi.  Kn= .042  LAG= 15.26 min.
 103          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 104          BA    .187
 105          LG    .126    .303    3.61    .313   38.57
 106          UI     41.    136.    222.    297.    467.    414.    304.    220.    131.     70.
 107          UI     47.     23.     13.     13.     13.      0.      0.      0.      0.      0.
 108          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 109          KK   DT141
 110          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.4 AC-FT FROM SUB-BASIN 141
 111          KM                                             (Hydrograph identified as OR141)
 112          KM                                            2) Balance of runoff continues on.
 113          KM                                             (Hydrograph identified as DT141)
 114          DT   OR141     2.4
 115          DI       0   10000
 116          DQ       0   10000

 117          KK   HC141
 118          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 141 WITH ROUTED FLOW FROM DETENTION
 119          HC       2
 120          KM   ******************************************************************************

 121          KK  DVT141   SPLIT HYDROGRAPH 141 TO DET142 AND HC142
 122          KM           DI-DQ BASED ON HYDRAULIC RATING CURVE FOR PROPOSED INLET AND
 123          KM           EXISTING 30" PIPE.  WEIR LENGTH IS 29' WEIR CREST AT ELEV 1321.
 124          KM           DQ IS AMOUNT DIVERTED AROUND DETENTION BASIN DOWNSTREAM.
 125          KM           DI-DQ DIFFERENCE IS ROUTED THRU THE PROPOSED DETENTION BASIN
 126          DT  DVT141
 127          DI       0       5      10      25      57     114     188     275
 128          DQ       0       5      10      25      26      27      28      29
 129          KM   ******************************************************************************

 130          KK    142S
 131          KM   RUNOFF GENERATED ON SUB-BASIN 142
 132          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 133          KM    L= 1.16 mi.  Lca= 0.75 mi.  S= 257 ft/mi.  Kn= .042  LAG= 19.99 min.
 134          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 135          BA    .512
 136          LG    .127    .309    4.12    .267   34.03
 137          UI     86.    178.    377.    488.    608.    839.   1049.    795.    637.    498.
 138          UI    380.    210.    146.    107.     80.     26.     26.     26.     26.      0.
 139          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 140          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 141          KK   DT142
 142          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 3.6 AC-FT FROM SUB-BASIN 142
 143          KM                                              (Hydrograph identified as OR142)
 144          KM                                           2) Balance of runoff continues on.
 145          KM                                              (Hydrograph identified as DT142)
 146          DT   OR142     3.6
 147          DI       0   10000
 148          DQ       0   10000
 149          KM   ******************************************************************************

 150          KK  DVT142   SPLIT HYDROGRAPH DVT142 TO DET142 AND HC142
 151          KM           DI-DQ BASED ON HYDRAULIC RATING CURVE FOR PROPOSED INLET AND
 152          KM           IMPROVED WASH CROSS SECTION.  WEIR LENGTH IS 100' WEIR CREST ELEV IS
 153          KM           3.34' ABOVE WASH FLOWLINE AT 1319.  HEC-2 SPLIT FLOW OPTION USED TO
 154          KM           ESTIMATE THE INLET HYDRAULICS AT THE INCREMENTAL FLOW RATES.
 155          KM           DQ IS AMOUNT DIVERTED AROUND DETENTION BASIN DOWNSTREAM.
 156          KM           DI-DQ DIFFERENCE IS ROUTED THRU THE PROPOSED DETENTION BASIN
 157          DT  DVT142
 158          DI       0      50     100     150     195     200     250     300     350     400
 159          DI     450     500     550     600     650     672     700     750
 160          DQ       0      50     100     150     195     197     223     248     271     293
 161          DQ     317     346     378     399     408     410     413     418

 162          KK  ADD142
 163          KM   COMBINE HYDROGRAPHS FROM (DI-DQ) FROM DVT141 WITH (DI-DQ) FROM DVT142
 164          HC       2

 165          KK  DET142   ROUTE HYDROGRAPH ADD142 THRU DET BASIN 142
 166          KM           30" RCP  AS LOW FLOW AND PRINCIPAL OUTLET (INV. EL. 1306.8)
 167          KM           260' EMERGENCY WEIR AT ELEV. 1318.3
 168          RS       1    STOR      -1
 169          SV     0.0   0.006   0.283   1.103   2.596   4.477   6.448   8.507   10.66   12.89
 170          SV   15.22   17.64   20.14   20.92   21.44   22.21   22.73   25.42
 171          SQ       0       0     0.0     0.0     5.0    15.0    29.0    40.0    49.0    57.0
 172          SQ      65      70      74      75     151     371     565    1924
 173          SE  1306.8    1307    1308    1309    1310    1311    1312    1313    1314    1315
 174          SE    1316    1317    1318  1318.3  1318.5  1318.8    1319    1320

 175          KK  DVT141     RETRIEVE PREVIOUSLY SPLIT HYDROGRAPH FROM SUB-BASIN 141
 176          DR  DVT141

 177          KK  DVT142     RETRIEVE PREVIOUSLY SPLIT HYDROGRAPH FROM SUB-BASIN 142
 178          DR  DVT142

 179          KK   HC142
 180          KM   COMBINE HYDROGRAPHS (DQ) FROM DVT142, (DQ) FROM DVT141 AND DET142 OUTFLOW
 181          HC       3
 182          KM   ******************************************************************************
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

  183         KK   RM142
  184         KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASINS 141/142 THROUGH 143
  185         KM            1) Reach Length = 5140 ft.
  186         RD
  187         RC    .050    .045    .050    5140   .0086
  188         RX       0       0    43.8    61.3    67.4    78.3    89.8    89.8
  189         RY    10.8     9.4     9.4       0       0     5.4     8.8    10.8

  190         KK    143S
  191         KM   RUNOFF GENERATED ON SUB-BASIN 143
  192         KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  193         KM    L= 1.64 mi.  Lca= 0.88  S= 273 ft/mi.  Kn= .035  LAG= 19.96 min.
  194         KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
  195         BA    .604
  196         LG    .115    .279    4.12    .269   49.66
  197         UI    102.    212.    446.    577.    720.    994.   1238.    937.    750.    586.
  198         UI    447.    244.    173.    125.     93.     31.     31.     31.     31.      0.
  199         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
  200         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  201         KK   DT143
  202         KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 5.7 AC-FT FROM SUB-BASIN 143
  203         KM                                              (Hydrograph identified as OR143)
  204         KM                                            2) Balance of runoff continues on.
  205         KM                                              (Hydrograph identified as DT143)
  206         DT   OR143     5.7
  207         DI       0   10000
  208         DQ       0   10000

  209         KK   HC143
  210         KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 143 WITH ROUTED FLOW FROM 141/142
  211         HC       2

  212         KK   RM143
  213         KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASIN 143 THROUGH 144
  214         KM            1) Reach Length = 1400 ft.
  215         RD
  216         RC    .040    .035    .030    1400   .0100
  217         RX       0       0    77.8    88.3    96.6   112.8   161.3   161.3
  218         RY      10     6.2     6.2       0       0     6.3     6.9      10

  219         KK    144S
  220         KM   RUNOFF GENERATED ON SUB-BASIN 144
  221         KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  222         KM    L= 1.80 mi.  Lca= 1.11 mi.  S= 291 ft/mi.  Kn= .036  LAG= 22.95 min.
  223         KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
  224         BA    .475
  225         LG    .118    .280    3.61     .32   43.17
  226         UI     70.    108.    269.    357.    428.    527.    721.    857.    657.    543.
  227         UI    437.    353.    256.    145.    117.     85.     70.     26.     21.     21.
  228         UI     21.     21.      0.      0.      0.      0.      0.      0.      0.      0.
  229         UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 230          KK   DT144
 231          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.1 AC-FT FROM SUB-BASIN 144
 232          KM                                              (Hydrograph identified as OR144)
 233          KM                                            2) Balance of runoff continues on.
 234          KM                                              (Hydrograph identified as DT144)
 235          DT   OR144     2.1
 236          DI       0   10000
 237          DQ       0   10000

 238          KK   HC144
 239          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 144 WITH ROUTED FLOW FROM 143
 240          HC       2

 241          KK   RM144
 242          KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASIN 144 THROUGH 145
 243          KM            1) Reach Length = 3000 ft.
 244          RD
 245          RC    .035    .035    .030    3000   .0073
 246          RX       0       0    36.6      52    64.9    79.8   107.8   107.8
 247          RY      11     7.7     7.4       0       0     8.3     8.5      11

 248          KK    145S
 249          KM   RUNOFF GENERATED ON SUB-BASIN 145
 250          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 251          KM    L= 1.37 mi.  Lca= 0.86 mi.  S= 242 ft/mi.  Kn= .032  LAG= 17.28 min.
 252          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 253          BA    .548
 254          LG    .105    .265    5.67    .210   44.60
 255          UI    107.    287.    526.    678.    922.   1303.    982.    755.    568.    378.
 256          UI    186.    145.     98.     33.     33.     33.     33.      0.      0.      0.
 257          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 258          KK   HC145
 259          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 145 WITH ROUTED FLOW FROM 144
 260          KM   ALSO DETERMINES 10TH STREET WASH DISCHARGE INTO ACDC
 261          HC       2
 262          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

 45         140S
              .
 69           .-------> OR140
 64       DT140
              V
              V
 85       140RR
              V
              V
 92       RM140
              .
 99           .        141S
              .           .
              .           .-------> OR141
 114          .
 109          .       DT141
              .           .
              .           .
 117      HC141............
              .
 126          .-------> DVT141
 121      DVT141
              .
 130          .        142S
              .           .
              .           .-------> OR142
 146          .
 141          .       DT142
              .           .
              .           .-------> DVT142
 157          .
 150          .      DVT142
              .           .
              .           .
 162      ADD142...........
              V
              V
 165      DET142
              .
              .
 176          .           <------- DVT141
 175          .      DVT141
              .           .
              .           .
 178          .           .           <------- DVT142
 177          .           .      DVT142
              .           .           .
              .           .           .
 179      HC142.......................
              V
              V
 183      RM142
              .
              .
 190          .        143S
              .           .
              .           .-------> OR143
 206          .
 201          .       DT143
              .           .
              .           .
 209      HC143............
              V
              V
 212      RM143
              .
              .
 219          .        144S
              .           .
              .           .-------> OR144
 235          .
 230          .       DT144
              .           .
              .           .
 238      HC144............
              V
              V
 241      RM144
              .
              .
 248          .        145S
              .           .
              .           .
 258      HC145............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  10/02/1996  TIME  18:13:55 *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
TENTH STREET WASH DETENTION BASIN NO 1 (FCD 93-31)
STANLEY CONSULTANTS, INC. (SCI JOB # 12183)
HEC-1 INPUT FILENAME : 12183H1D

****

THIS MODEL REPRESENTS THE PROPOSED 10TH STREET WASH DETENTION BASIN #1.
THE FOLLOWING IMPROVEMENTS ARE REFLECTED.

1. EAST TRIBUTARY (SUB-BASIN 141): 29' WEIR INLET AT CREST ELEV. 1321. DIVERSION RECORDS REFLECT BYPASS OF LOW FLOWS THROUGH EXISTING 30" CMP AND INLET RATING CURVE.
1. WEST TRIBUTARY (SUB-BASIN 142): 100' SIDE WEIR 3.34' ABOVE PROPOSED FLOW LINE AT WEIR CREST ELEV. 1319. DIVERSION RECORDS REFLECT LOW FLOW BYPASS AND INLET RATING CURVE.
2. BASIN CONFIGURATION: 3:1 SLOPES ON 3 SIDES AND A VERTICAL RETAINING WALL ON THE WEST SIDE, A BOTTOM ELEVATION (OUTLET INV. ELEV.) OF 1306.8, AND A HIGH WATER ELEV. 1319 WITH 1' FREEBOARD TO ELEV. 1320.
3. OUTLET CONFIGURATION: 30" RCP AT INV. ELEV. 1306.8 AS THE LOW FLOW AND PRINCIPAL OUTLET, AND A 260' EMERGENCY WEIR AT CREST ELEV. 1318.3.

****

****

THIS HEC-1 MODEL IS BASED ON THE KAMINSKI-HUBBARD ACDC ADMS AS MODIFIED BY FCD TO REFLECT TWO HYPOTHETICAL DETENTION BASINS (NUMBERS 1 AND 2). THE DIFFERENCES BETWEEN THIS MODEL AND THE ORIGINAL MODEL TRANSMITTED BY FCD TO SCI AT THE PROJECT KICKOFF MEETING ARE AS FOLLOWS:

1. USE OF THE HEC-1 DATA STORAGE SYSTEM OPTION HAS BEEN DELETED;
2. THE TWO HYPOTHETICAL DETENTION BASINS 1 AND 2 HAVE BEEN DELETED;
3. THE CROSS SECTIONAL AREA OF THE PRINCIPAL SPILLWAY OUTLET PIPE OF THE EXISTING CITY OF PHOENIX DET BASIN NO. 3 HAS BEEN CHANGED FROM 4.91 SQFT (WHICH CORRESPONDS TO AN OUTLET PIPE DIAM OF 30") TO 1.36 SQFT CORRESPONDING TO THE 14" X 14" STEEL ORIFICE PLATE WHICH WAS ORIGINALLY DESIGNED AND INSTALLED.

****

ACDC AREA DRAINAGE MASTER STUDY
10TH STREET WASH WATERSHED
FILENAME: TEN36.DAT KHE JOB NO. 0146
100-YEAR 6-HOUR DURATION STORM

```
44 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
```

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	140S	496.	4.25	69.	28.	28.	.52		
DIVERSION TO	OR140	20.	4.25	4.	2.	2.	.52		
HYDROGRAPH AT	DT140	496.	4.25	65.	26.	26.	.52		
ROUTED TO	140RR	26.	5.10	25.	18.	18.	.52	72.36	5.15
ROUTED TO	RM140	26.	5.45	25.	18.	18.	.52		
HYDROGRAPH AT	141S	263.	4.10	38.	15.	15.	.19		
DIVERSION TO	OR141	57.	4.10	5.	2.	2.	.19		
HYDROGRAPH AT	DT141	263.	4.10	33.	13.	13.	.19		
2 COMBINED AT	HC141	275.	4.10	56.	31.	31.	.70		
DIVERSION TO	DVT141	29.	4.10	26.	19.	19.	.70		
HYDROGRAPH AT	DVT141	246.	4.10	30.	12.	12.	.70		
HYDROGRAPH AT	142S	671.	4.15	100.	40.	40.	.51		
DIVERSION TO	OR142	45.	4.15	7.	3.	3.	.51		
HYDROGRAPH AT	DT142	671.	4.15	93.	37.	37.	.51		
DIVERSION TO	DVT142	410.	4.15	69.	28.	28.	.51		
HYDROGRAPH AT	DVT142	261.	4.15	24.	9.	9.	.51		
2 COMBINED AT	ADD142	504.	4.15	54.	22.	22.	1.21		
ROUTED TO	DET142	105.	4.60	46.	20.	20.	1.21	1318.38	4.60
HYDROGRAPH AT	DVT141	29.	4.10	26.	19.	19.	.00		
HYDROGRAPH AT	DVT142	410.	4.15	69.	28.	28.	.00		
3 COMBINED AT	HC142	502.	4.25	139.	67.	67.	1.21		
ROUTED TO	RM142	498.	4.40	139.	66.	66.	1.21		
HYDROGRAPH AT	143S	841.	4.15	136.	55.	55.	.60		
DIVERSION TO	OR143	58.	4.15	11.	5.	5.	.60		
HYDROGRAPH AT	DT143	841.	4.15	125.	50.	50.	.60		
2 COMBINED AT	HC143	1294.	4.25	260.	116.	116.	1.82		
ROUTED TO	RM143	1289.	4.25	260.	116.	116.	1.82		
HYDROGRAPH AT	144S	615.	4.20	100.	40.	40.	.47		
DIVERSION TO	OR144	14.	4.20	4.	2.	2.	.47		
HYDROGRAPH AT	DT144	615.	4.20	96.	38.	38.	.47		
2 COMBINED AT	HC144	1904.	4.25	352.	154.	154.	2.29		
ROUTED TO	RM144	1894.	4.30	352.	154.	154.	2.29		
HYDROGRAPH AT	145S	786.	4.10	121.	49.	49.	.55		
2 COMBINED AT	HC145	2586.	4.25	464.	203.	203.	2.84		

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

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
RM140	MANE	3.00	26.07	330.00	.79	3.00	26.07	330.00	.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2263E+02 EXCESS= .0000E+00 OUTFLOW= .2176E+02 BASIN STORAGE= .6323E+00 PERCENT ERROR= 1.1

RM142	MANE	3.00	498.25	264.00	1.26	3.00	498.25	264.00	1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8243E+02 EXCESS= .0000E+00 OUTFLOW= .8160E+02 BASIN STORAGE= .1045E+01 PERCENT ERROR= -.3

RM143	MANE	2.16	1291.46	257.15	1.48	3.00	1289.22	255.00	1.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1435E+03 EXCESS= .0000E+00 OUTFLOW= .1433E+03 BASIN STORAGE= .2387E+00 PERCENT ERROR= -.1

RM144	MANE	3.00	1894.22	258.00	1.56	3.00	1894.22	258.00	1.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1908E+03 EXCESS= .0000E+00 OUTFLOW= .1904E+03 BASIN STORAGE= .6384E+00 PERCENT ERROR= -.1

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

```
****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*            SEPTEMBER 1990            *
*             VERSION 4.0              *
*                                      *
*  RUN DATE  11/04/1996  TIME  11:27:38 *
*                                      *
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X               X
XXXXXXX  XXXX    X       XXXXX   X
X     X  X       X               X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX        XXX
```

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

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

WITH RECREATIONAL IMPROVEMENTS

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

  1           ID
  2           ID        POINTE TAPATIO CLIFFS RESORT CONDOMINIUMS HOMEOWNERS ASSOCIATION
  3           ID        PROPOSED RECREATIONAL IMPROVEMENTS WITHIN 10TH ST WASH DET BASIN NO. 1
  4           ID        STANLEY CONSULTANTS PROJECT # 13160     HEC-1 INPUT FILENAME: 13160H1A
  5           ID
  6           ID        ////////////////////////////////////////////////////////////////////////
  7           ID        THIS MODEL IS BASED ON 10TH ST WASH DET BASIN NO. 1 MODEL 12183H1D. IT
  8           ID        REFLECTS PROPOSED RECREATIONAL IMPROVEMENTS IN THE BASIN AS A LOSS OF
  9           ID        APPROXIMATELY 0.14 ACRE FEET OF STORAGE VOLUME BEGINNING AT ELEV 1309.0
 10           ID        ALL OTHER ASPECTS OF THE TWO MODELS ARE IDENTICAL.
 11           ID        ////////////////////////////////////////////////////////////////////////
 12           ID
 13           ID        FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 14           ID        TENTH STREET WASH DETENTION BASIN NO 1  (FCD 93-31)
 15           ID        STANLEY CONSULTANTS, INC.  (SCI JOB # 12183)
 16           ID        HEC-1 INPUT FILENAME :  12183H1D
 17           ID
 18           ID        ************************************************************************
 19           ID        THIS MODEL REPRESENTS THE PROPOSED 10TH STREET WASH DETENTION BASIN #1.
 20           ID        THE FOLLOWING IMPROVEMENTS ARE REFLECTED.
 21           ID          1. EAST TRIBUTARY (SUB-BASIN 141): 29' WEIR INLET AT CREST ELEV. 1321.
 22           ID             DIVERSION RECORDS REFLECT BYPASS OF LOW FLOWS THROUGH EXISTING 30"
 23           ID             CMP AND INLET RATING CURVE.
 24           ID          1. WEST TRIBUTARY (SUB-BASIN 142): 100' SIDE WEIR 3.34' ABOVE PROPOSED
 25           ID             FLOW LINE AT WEIR CREST ELEV. 1319.  DIVERSION RECORDS REFLECT LOW
 26           ID             FLOW BYPASS AND INLET RATING CURVE.
 27           ID          2. BASIN CONFIGURATION: 3:1 SLOPES ON 3 SIDES AND A VERTICAL RETAINING
 28           ID             WALL ON THE WEST SIDE, A BOTTOM ELEVATION (OUTLET INV. ELEV.) OF
 29           ID             1306.8, AND A HIGH WATER ELEV. 1319 WITH 1' FREEBOARD TO ELEV.
 30           ID             1320.
 31           ID          3. OUTLET CONFIGURATION: 30" RCP AT INV. ELEV. 1306.8 AS THE LOW FLOW
 32           ID             AND PRINCIPAL OUTLET, AND A 260' EMERGENCY WEIR AT CREST ELEV.
 33           ID             1318.3.
 34           ID        ************************************************************************
 35           ID
 36           ID        ************************************************************************
 37           ID        THIS HEC-1 MODEL IS BASED ON THE KAMINSKI-HUBBARD ACDC ADMS AS MODIFIED
 38           ID        BY FCD TO REFLECT TWO HYPOTHETICAL DETENTION BASINS (NUMBERS 1 AND 2).
 39           ID        THE DIFFERENCES BETWEEN THIS MODEL AND THE ORIGINAL MODEL TRANSMITTED
 40           ID        BY FCD TO SCI AT THE PROJECT KICKOFF MEETING ARE AS FOLLOWS:
 41           ID          1. USE OF THE HEC-1 DATA STORAGE SYSTEM OPTION HAS BEEN DELETED;
 42           ID          2. THE TWO HYPOTHETICAL DETENTION BASINS 1 AND 2 HAVE BEEN DELETED;
 43           ID          3. THE CROSS SECTIONAL AREA OF THE PRINCIPAL SPILLWAY OUTLET PIPE OF
 44           ID             THE EXISTING CITY OF PHOENIX DET BASIN NO. 3 HAS BEEN CHANGED FROM
 45           ID             4.91 SQFT (WHICH CORRESPONDS TO AN OUTLET PIPE DIAM OF 30") TO
 46           ID             1.36 SQFT CORRESPONDING TO THE 14" X 14" STEEL ORIFICE PLATE WHICH
 47           ID             WAS ORIGINALLY DESIGNED AND INSTALLED.
 48           ID        ************************************************************************
 49           ID
 50           ID   ACDC AREA DRAINAGE MASTER STUDY
 51           ID   10TH STREET WASH WATERSHED
 52           ID   FILENAME:  TEN36.DAT     KHE JOB NO. 0146
 53           ID   100-YEAR 6-HOUR DURATION STORM
              *
              *  Based on FCDMC comments dated March 17,1992 we adjusted the Mannings "n"
              *  coefficient to reflect weighted averaging in lieu of log averaging.
              *  We also changed the S-graph from Phoenix Mountain to Phoenix Valley.
              *
              *DIAGRAM
```

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

  54          IT       3                    300
  55          IO       5

  56          KK    140S
  57          KM   RUNOFF GENERATED ON SUB-BASIN 140
  58          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
  59          KM    L= 1.22 mi.  Lca= 0.51 mi.  S= 162 ft/mi.  Kn= .050  LAG= 22.87 min.
  60          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
  61          BA    .516
  62          IN      15
  63          KM   RAINFALL DEPTH OF 3.00 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
  64          KM   AN AREAL REDUCTION COEFFICIENT OF .975 WAS USED
  65          PB  2.9200
  66          KM   THE FOLLOWING PC RECORD USED A 6-HOUR RAINFALL WITH PATTERN NO. 2.01
  67          PC    .000    .009    .016    .025    .034    .042    .051    .059    .067    .076
  68          PC    .087    .100    .120    .163    .252    .451    .694    .837    .900    .938
  69          PC    .950    .963    .975    .988   1.000
  70          LG    .145    .339   4.25    .488   20.44
  71          UI     76.    119.    294.    391.    468.    577.    793.    930.    712.    588.
  72          UI    474.    381.    274.    154.    127.     90.     76.     26.     23.     23.
  73          UI     23.     23.      0.      0.      0.      0.      0.      0.      0.      0.
  74          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

  75          KK   DT140
  76          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.0 AC-FT FROM SUB-BASIN 140
  77          KM                                              (Hydrograph identified as OR140)
  78          KM                                            2) Balance of runoff continues on.
  79          KM                                              (Hydrograph identified as DT140)
  80          DT   OR140     2.0
  81          DI       0   10000
  82          DQ       0   10000
  83          KM   ******************************************************************************
  84          KM     KK 140RR
  85          KM     KM ROUTE FLOW THROUGH NORTH MOUNTAIN DETENTION NO.3
  86          KM     RS      1    ELEV    55.9
  87          KM     SV      0     .06    1.52    6.32   17.42   35.46   60.34   95.64
  88          KM     SE   55.9      58      62      66      70      74      78      82
  89          KM     SL 57.15    4.91      .6      .5
  90          KM        ***********************************************************************
  91          KM     THE SL RECORD (LOW-LEVEL OUTLET) SECOND FIELD (ORIFICE AREA) VALUE HAS
  92          KM     BEEN CHANGED BY SCI FROM 4.91 sq.ft. TO 1.36 sq.ft. (14"x14" INLET)
  93          KM        ***********************************************************************
  94          KM     SS 79.66     100     3.0     1.5
  95          KM   ******************************************************************************

  96          KK   140RR
  97          KM   ROUTE FLOW THROUGH NORTH MOUNTAIN DETENTION NO.3
  98          RS      1    ELEV    55.9
  99          SV      0     .06    1.52    6.32   17.42   35.46   60.34   95.64
 100          SE   55.9      58      62      66      70      74      78      82
 101          SL   56.43    1.36      .6      .5
 102          SS   80.00     100     3.0     1.5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

103           KK   RM140
104           KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM DETENTION BASIN THROUGH SUB-BASIN 141
105           KM            1) Reach Length = 3600 ft.
106           RD
107           RC    .045    .045    .045    3600   .0108
108           RX       0       0    46.5    76.4    79.9   110.2   160.2   160.2
109           RY      16    12.6     7.3       0       0     9.9    15.9      16

110           KK    141S
111           KM   RUNOFF GENERATED ON SUB-BASIN 141
112           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
113           KM    L= 0.83 mi.  Lca= 0.57 mi.  S= 315 ft/mi.  Kn= .042  LAG= 15.26 min.
114           KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
115           BA    .187
116           LG    .126    .303    3.61    .313   38.57
117           UI     41.    136.    222.    297.    467.    414.    304.    220.    131.     70.
118           UI     47.     23.     13.     13.     13.      0.      0.      0.      0.      0.
119           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

120           KK   DT141
121           KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.4 AC-FT FROM SUB-BASIN 141
122           KM                                              (Hydrograph identified as OR141)
123           KM                                            2) Balance of runoff continues on.
124           KM                                              (Hydrograph identified as DT141)
125           DT   OR141     2.4
126           DI       0   10000
127           DQ       0   10000

128           KK   HC141
129           KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 141 WITH ROUTED FLOW FROM DETENTION
130           HC       2
131           KM   ******************************************************************************

132           KK  DVT141   SPLIT HYDROGRAPH 141 TO DET142 AND HC142
133           KM           DI-DQ BASED ON HYDRAULIC RATING CURVE FOR PROPOSED INLET AND
134           KM           EXISTING 30" PIPE.  WEIR LENGTH IS 29' WEIR CREST AT ELEV 1321.
135           KM           DQ IS AMOUNT DIVERTED AROUND DETENTION BASIN DOWNSTREAM.
136           KM           DI-DQ DIFFERENCE IS ROUTED THRU THE PROPOSED DETENTION BASIN
137           DT  DVT141
138           DI       0       5      10      25      57     114     188     275
139           DQ       0       5      10      25      26      27      28      29
140           KM   ******************************************************************************

141           KK    142S
142           KM   RUNOFF GENERATED ON SUB-BASIN 142
143           KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
144           KM    L= 1.16 mi.  Lca= 0.75 mi.  S= 257 ft/mi.  Kn= .042  LAG= 19.99 min.
145           KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
146           BA    .512
147           LG    .127    .309    4.12    .267   34.03
148           UI     86.    178.    377.    488.    608.    839.   1049.    795.    637.    498.
149           UI    380.    210.    146.    107.     80.     26.     26.     26.     26.      0.
150           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
151           UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 152          KK   DT142
 153          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 3.6 AC-FT FROM SUB-BASIN 142
 154          KM                                               (Hydrograph identified as OR142)
 155          KM                                            2) Balance of runoff continues on.
 156          KM                                               (Hydrograph identified as DT142)
 157          DT   OR142     3.6
 158          DI       0   10000
 159          DQ       0   10000
 160          KM   ******************************************************************************

 161          KK  DVT142   SPLIT HYDROGRAPH DVT142 TO DET142 AND HC142
 162          KM           DI-DQ BASED ON HYDRAULIC RATING CURVE FOR PROPOSED INLET AND
 163          KM           IMPROVED WASH CROSS SECTION.  WEIR LENGTH IS 100' WEIR CREST ELEV IS
 164          KM           3.34' ABOVE WASH FLOWLINE AT 1319.  HEC-2 SPLIT FLOW OPTION USED TO
 165          KM           ESTIMATE THE INLET HYDRAULICS AT THE INCREMENTAL FLOW RATES.
 166          KM           DQ IS AMOUNT DIVERTED AROUND DETENTION BASIN DOWNSTREAM.
 167          KM           DI-DQ DIFFERENCE IS ROUTED THRU THE PROPOSED DETENTION BASIN
 168          DT  DVT142
 169          DI       0      50     100     150     195     200     250     300     350     400
 170          DI     450     500     550     600     650     672     700     750
 171          DQ       0      50     100     150     195     197     223     248     271     293
 172          DQ     317     346     378     399     408     410     413     418

 173          KK  ADD142
 174          KM   COMBINE HYDROGRAPHS FROM (DI-DQ) FROM DVT141 WITH (DI-DQ) FROM DVT142
 175          HC       2

 176          KK  DET142   ROUTE HYDROGRAPH ADD142 THRU DET BASIN 142
 177          KM           30" RCP  AS LOW FLOW AND PRINCIPAL OUTLET (INV. EL. 1306.8)
 178          KM           260' EMERGENCY WEIR AT ELEV. 1318.3
 179          RS       1    STOR      -1
 180          SV     0.0   0.006   0.283   0.963   2.456   4.307   6.308   8.364   10.52   12.75
 181          SV   15.08   17.50   20.00   20.78   21.30   22.07   22.59   25.28
 182          SQ       0       0     0.0     0.0     5.0    15.0    29.0    40.0    49.0    57.0
 183          SQ      65      70      74      75     151     371     565    1924
 184          SE  1306.8    1307    1308    1309    1310    1311    1312    1313    1314    1315
 185          SE    1316    1317    1318  1318.3  1318.5  1318.8    1319    1320

 186          KK  DVT141    RETRIEVE PREVIOUSLY SPLIT HYDROGRAPH FROM SUB-BASIN 141
 187          DR  DVT141

 188          KK  DVT142    RETRIEVE PREVIOUSLY SPLIT HYDROGRAPH FROM SUB-BASIN 142
 189          DR  DVT142

 190          KK   HC142
 191          KM   COMBINE HYDROGRAPHS (DQ) FROM DVT142, (DQ) FROM DVT141 AND DET142 OUTFLOW
 192          HC       3
 193          KM   ******************************************************************************
```

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

 194          KK   RM142
 195          KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASINS 141/142 THROUGH 143
 196          KM            1) Reach Length = 5140 ft.
 197          RD
 198          RC    .050    .045    .050    5140   .0086
 199          RX       0       0   43.8    61.3    67.4    78.3    89.8    89.8
 200          RY    10.8     9.4     9.4       0       0     5.4     8.8    10.8

 201          KK    143S
 202          KM   RUNOFF GENERATED ON SUB-BASIN 143
 203          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 204          KM    L= 1.64 mi.  Lca= 0.88  S= 273 ft/mi.  Kn= .035  LAG= 19.96 min.
 205          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 206          BA    .604
 207          LG    .115    .279    4.12    .269   49.66
 208          UI    102.    212.    446.    577.    720.    994.   1238.    937.    750.    586.
 209          UI    447.    244.    173.    125.     93.     31.     31.     31.     31.      0.
 210          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
 211          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 212          KK   DT143
 213          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 5.7 AC-FT FROM SUB-BASIN 143
 214          KM                                               (Hydrograph identified as OR143)
 215          KM                                            2) Balance of runoff continues on.
 216          KM                                               (Hydrograph identified as DT143)
 217          DT   OR143     5.7
 218          DI       0   10000
 219          DQ       0   10000

 220          KK   HC143
 221          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 143 WITH ROUTED FLOW FROM 141/142
 222          HC       2

 223          KK   RM143
 224          KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASIN 143 THROUGH 144
 225          KM            1) Reach Length = 1400 ft.
 226          RD
 227          RC    .040    .035    .030    1400   .0100
 228          RX       0       0   77.8    88.3    96.6   112.8   161.3   161.3
 229          RY      10     6.2     6.2       0       0     6.3     6.9      10

 230          KK    144S
 231          KM   RUNOFF GENERATED ON SUB-BASIN 144
 232          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 233          KM    L= 1.80 mi.  Lca= 1.11 mi.  S= 291 ft/mi.  Kn= .036  LAG= 22.95 min.
 234          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 235          BA    .475
 236          LG    .118    .280    3.61     .32   43.17
 237          UI     70.    108.    269.    357.    428.    527.    721.    857.    657.    543.
 238          UI    437.    353.    256.    145.    117.     85.     70.     26.     21.     21.
 239          UI     21.     21.      0.      0.      0.      0.      0.      0.      0.      0.
 240          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.
```

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

 241          KK   DT144
 242          KM   THROW AWAY 10-YR 2-HR RETENTION VOLUME:  1) 2.1 AC-FT FROM SUB-BASIN 144
 243          KM                                              (Hydrograph identified as OR144)
 244          KM                                           2) Balance of runoff continues on.
 245          KM                                              (Hydrograph identified as DT144)
 246          DT   OR144     2.1
 247          DI       0   10000
 248          DQ       0   10000

 249          KK   HC144
 250          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 144 WITH ROUTED FLOW FROM 143
 251          HC       2

 252          KK   RM144
 253          KM   MUSKINGUM-CUNGE ROUTE IN CHANNEL FROM SUB-BASIN 144 THROUGH 145
 254          KM           1) Reach Length = 3000 ft.
 255          RD
 256          RC   .035    .035    .030    3000   .0073
 257          RX       0       0    36.6      52    64.9    79.8   107.8   107.8
 258          RY      11     7.7     7.4       0       0     8.3     8.5      11

 259          KK    145S
 260          KM   RUNOFF GENERATED ON SUB-BASIN 145
 261          KM    THE FOLLOWING PARAMETERS WERE PROVIDED FOR THIS BASIN
 262          KM    L= 1.37 mi.  Lca= 0.86 mi.  S= 242 ft/mi.  Kn= .032  LAG= 17.28 min.
 263          KM    PHOENIX VALLEY S-GRAPH WAS USED FOR THIS BASIN
 264          BA    .548
 265          LG    .105    .265    5.67    .210   44.60
 266          UI    107.    287.    526.    678.    922.   1303.    982.    755.    568.    378.
 267          UI    186.    145.     98.     33.     33.     33.     33.      0.      0.      0.
 268          UI      0.      0.      0.      0.      0.      0.      0.      0.      0.      0.

 269          KK   HC145
 270          KM   COMBINE HYDROGRAPHS FROM SUB-BASIN 145 WITH ROUTED FLOW FROM 144
 271          KM   ALSO DETERMINES 10TH STREET WASH DISCHARGE INTO ACDC
 272          HC       2
 273          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

 56         140S
              .
              .
 80           .-------->  OR140
 75        DT140
             V
             V
 96        140RR
             V
             V
103        RM140
              .
              .
110           .        141S
              .           .
              .           .
125           .           .-------->  OR141
120           .       DT141
              .           .
              .           .
128       HC141............
              .
              .
137           .-------->  DVT141
132      DVT141
              .
              .
141           .        142S
              .           .
              .           .
157           .           .-------->  OR142
152           .       DT142
              .           .
              .           .
168           .           .-------->  DVT142
161           .      DVT142
              .           .
              .           .
173      ADD142............
             V
             V
176      DET142
              .
              .
187           .           .<--------  DVT141
186           .      DVT141
              .           .
              .           .
189           .           .           .<--------  DVT142
188           .           .      DVT142
              .           .           .
              .           .           .
190       HC142........................
             V
             V
194       RM142
              .
              .
201           .        143S
              .           .
              .           .
217           .           .-------->  OR143
212           .       DT143
              .           .
              .           .
220       HC143............
             V
             V
223       RM143
              .
              .
230           .        144S
              .           .
              .           .
246           .           .-------->  OR144
241           .       DT144
              .           .
              .           .
249       HC144............
             V
             V
252       RM144
              .
              .
259           .        145S
              .           .
              .           .
269       HC145............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  11/04/1996  TIME  11:27:38 *
*                                       *
*****************************************
```

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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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POINTE TAPATIO CLIFFS RESORT CONDOMINIUMS HOMEOWNERS ASSOCIATION
PROPOSED RECREATIONAL IMPROVEMENTS WITHIN 10TH ST WASH DET BASIN NO. 1
STANLEY CONSULTANTS PROJECT # 13160     HEC-1 INPUT FILENAME: 13160H1A

////////////////////////////////////////////////////////////////////////
THIS MODEL IS BASED ON 10TH ST WASH DET BASIN NO. 1 MODEL 12183H1D. IT
REFLECTS PROPOSED RECREATIONAL IMPROVEMENTS IN THE BASIN AS A LOSS OF
APPROXIMATELY 0.14 ACRE FEET OF STORAGE VOLUME BEGINNING AT ELEV 1309.0
ALL OTHER ASPECTS OF THE TWO MODELS ARE IDENTICAL.
////////////////////////////////////////////////////////////////////////

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
TENTH STREET WASH DETENTION BASIN NO 1  (FCD 93-31)
STANLEY CONSULTANTS, INC.  (SCI JOB # 12183)
HEC-1 INPUT FILENAME :  12183H1D

**********************************************************************
THIS MODEL REPRESENTS THE PROPOSED 10TH STREET WASH DETENTION BASIN #1.
THE FOLLOWING IMPROVEMENTS ARE REFLECTED.
  1. EAST TRIBUTARY (SUB-BASIN 141): 29' WEIR INLET AT CREST ELEV. 1321.
     DIVERSION RECORDS REFLECT BYPASS OF LOW FLOWS THROUGH EXISTING 30"
     CMP AND INLET RATING CURVE.
  1. WEST TRIBUTARY (SUB-BASIN 142): 100' SIDE WEIR 3.34' ABOVE PROPOSED
     FLOW LINE AT WEIR CREST ELEV. 1319.  DIVERSION RECORDS REFLECT LOW
     FLOW BYPASS AND INLET RATING CURVE.
  2. BASIN CONFIGURATION: 3:1 SLOPES ON 3 SIDES AND A VERTICAL RETAINING
     WALL ON THE WEST SIDE, A BOTTOM ELEVATION (OUTLET INV. ELEV.) OF
     1306.8, AND A HIGH WATER ELEV. 1319 WITH 1' FREEBOARD TO ELEV.
     1320.
  3. OUTLET CONFIGURATION: 30" RCP AT INV. ELEV. 1306.8 AS THE LOW FLOW
     AND PRINCIPAL OUTLET, AND A 260' EMERGENCY WEIR AT CREST ELEV.
     1318.3.
**********************************************************************

**********************************************************************
THIS HEC-1 MODEL IS BASED ON THE KAMINSKI-HUBBARD ACDC ADMS AS MODIFIED
BY FCD TO REFLECT TWO HYPOTHETICAL DETENTION BASINS (NUMBERS 1 AND 2).
THE DIFFERENCES BETWEEN THIS MODEL AND THE ORIGINAL MODEL TRANSMITTED
BY FCD TO SCI AT THE PROJECT KICKOFF MEETING ARE AS FOLLOWS:
  1. USE OF THE HEC-1 DATA STORAGE SYSTEM OPTION HAS BEEN DELETED;
  2. THE TWO HYPOTHETICAL DETENTION BASINS 1 AND 2 HAVE BEEN DELETED;
  3. THE CROSS SECTIONAL AREA OF THE PRINCIPAL SPILLWAY OUTLET PIPE OF
     THE EXISTING CITY OF PHOENIX DET BASIN NO. 3 HAS BEEN CHANGED FROM
     4.91 SQFT (WHICH CORRESPONDS TO AN OUTLET PIPE DIAM OF 30") TO
     1.36 SQFT CORRESPONDING TO THE 14" X 14" STEEL ORIFICE PLATE WHICH
     WAS ORIGINALLY DESIGNED AND INSTALLED.
**********************************************************************

ACDC AREA DRAINAGE MASTER STUDY
10TH STREET WASH WATERSHED
FILENAME:  TEN36.DAT     KHE JOB NO. 0146
100-YEAR 6-HOUR DURATION STORM

55 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
```

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

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	140S	496.	4.25	69.	28.	28.	.52		
DIVERSION TO	OR140	20.	4.25	4.	2.	2.	.52		
HYDROGRAPH AT	DT140	496.	4.25	65.	26.	26.	.52		
ROUTED TO	140RR	26.	5.10	25.	18.	18.	.52	72.36	5.15
ROUTED TO	RM140	26.	5.45	25.	18.	18.	.52		
HYDROGRAPH AT	141S	263.	4.10	38.	15.	15.	.19		
DIVERSION TO	OR141	57.	4.10	5.	2.	2.	.19		
HYDROGRAPH AT	DT141	263.	4.10	33.	13.	13.	.19		
2 COMBINED AT	HC141	275.	4.10	56.	31.	31.	.70		
DIVERSION TO	DVT141	29.	4.10	26.	19.	19.	.70		
HYDROGRAPH AT	DVT141	246.	4.10	30.	12.	12.	.70		
HYDROGRAPH AT	142S	671.	4.15	100.	40.	40.	.51		
DIVERSION TO	OR142	45.	4.15	7.	3.	3.	.51		
HYDROGRAPH AT	DT142	671.	4.15	93.	37.	37.	.51		
DIVERSION TO	DVT142	410.	4.15	69.	28.	28.	.51		
HYDROGRAPH AT	DVT142	261.	4.15	24.	9.	9.	.51		
2 COMBINED AT	ADD142	504.	4.15	54.	22.	22.	1.21		
ROUTED TO	DET142	111.	4.60	46.	20.	20.	1.21	1318.40	4.60
HYDROGRAPH AT	DVT141	29.	4.10	26.	19.	19.	.00		
HYDROGRAPH AT	DVT142	410.	4.15	69.	28.	28.	.00		
3 COMBINED AT	HC142	502.	4.25	139.	67.	67.	1.21		
ROUTED TO	RM142	499.	4.40	139.	66.	66.	1.21		
HYDROGRAPH AT	143S	841.	4.15	136.	55.	55.	.60		
DIVERSION TO	OR143	58.	4.15	11.	5.	5.	.60		
HYDROGRAPH AT	DT143	841.	4.15	125.	50.	50.	.60		
2 COMBINED AT	HC143	1295.	4.25	261.	116.	116.	1.82		
ROUTED TO	RM143	1290.	4.25	261.	116.	116.	1.82		
HYDROGRAPH AT	144S	615.	4.20	100.	40.	40.	.47		
DIVERSION TO	OR144	14.	4.20	4.	2.	2.	.47		
HYDROGRAPH AT	DT144	615.	4.20	96.	38.	38.	.47		
2 COMBINED AT	HC144	1905.	4.25	353.	155.	155.	2.29		
ROUTED TO	RM144	1895.	4.30	353.	154.	154.	2.29		
HYDROGRAPH AT	145S	786.	4.10	121.	49.	49.	.55		
2 COMBINED AT	HC145	2587.	4.25	464.	203.	203.	2.84		

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

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	INTERPOLATED TO COMPUTATION INTERVAL DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)
RM140	MANE	3.00	26.07	330.00	.79	3.00	26.07	330.00	.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2263E+02 EXCESS= .0000E+00 OUTFLOW= .2176E+02 BASIN STORAGE= .6323E+00 PERCENT ERROR= 1.1

RM142	MANE	3.00	498.58	264.00	1.26	3.00	498.58	264.00	1.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8257E+02 EXCESS= .0000E+00 OUTFLOW= .8175E+02 BASIN STORAGE= .1045E+01 PERCENT ERROR= -.3

RM143	MANE	2.16	1292.16	257.12	1.48	3.00	1289.96	255.00	1.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1437E+03 EXCESS= .0000E+00 OUTFLOW= .1435E+03 BASIN STORAGE= .2386E+00 PERCENT ERROR= -.1

RM144	MANE	3.00	1894.99	258.00	1.56	3.00	1894.99	258.00	1.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1910E+03 EXCESS= .0000E+00 OUTFLOW= .1905E+03 BASIN STORAGE= .6382E+00 PERCENT ERROR= -.1

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