DRAINAGE REPORT
FOR
DESERT HILLS DRIVE

March 1996
CBA Project No. 241746-02

CELLA BARR
ASSOCIATES

Report Prepared
Under Supervision
of: Scot S. Schlund, P.E.

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FOR
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1.0 INTRODUCTION

This drainage study has been prepared under contract with Maricopa County Department of Transportation for roadway improvements at the Desert Hills Drive/Skunk Creek crossing. The purpose of this report is to provide the necessary hydraulic analysis, to support the proposed improvements.

The Desert Hills Drive/Skunk Creek crossing is located within Maricopa County, Arizona. The site is located on the Section line dividing Section 19 from Section 30, Township 6N, Range 3E of the Salt River and Gila River Base and Meridian. The vicinity map, (Figure 1) illustrates the Desert Hills Drive/Skunk Creek crossing in relationship to the City of Phoenix street system.

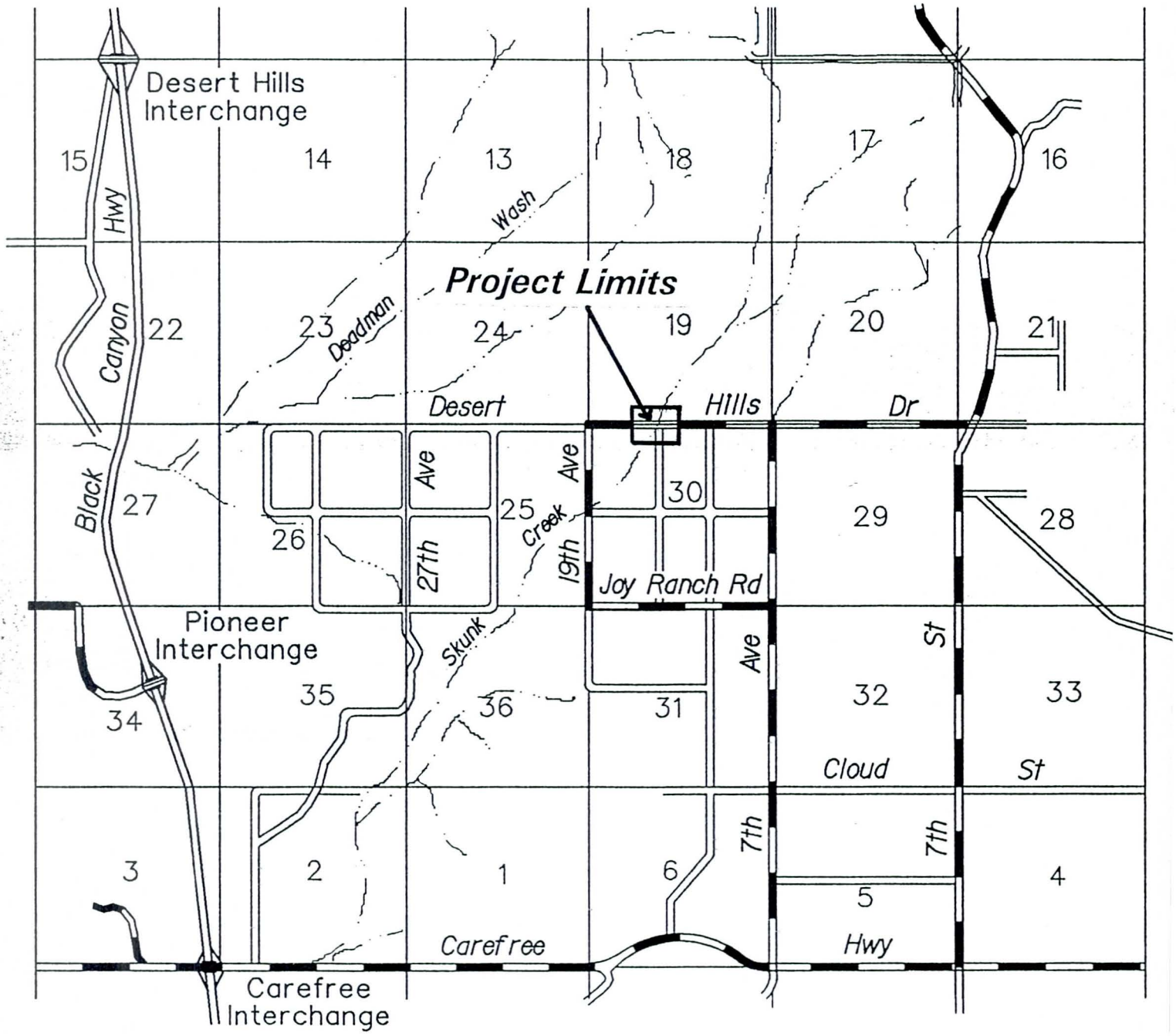
Desert Hills Drive exists as a rural two lane road with a dip section at the Skunk Creek Crossing. The proposed improvements are located at the Skunk Creek crossing and consist of the following:

- Construction of four 10'X4' box culverts.
- Repaving of Desert Hills Drive at the Skunk Creek Crossing

2.0 EVALUATION CRITERIA AND PROCEDURES

The following criteria, procedures and methods have been employed in the evaluation of drainage conditions for the Desert Hills Drive/Skunk Creek crossing:

1. The 10-, 50-, 100- and 500-year event peak discharges, 13100 cfs, 19,100 cfs 28,100 cfs and 36,000 cfs respectively were obtained from the "Flood Insurance Study Unincorporated Areas of Maricopa County, Arizona" (January 1979) prepared by Harris-Toups Associates.



VICINITY MAP

Not to Scale

FIGURE 1

2. The 25-year Frequency (18,100 cfs) was estimated graphically by plotting Flood Frequencies on probability paper (Appendix A).

3. The HEC-2 model developed by Harris-Toups Associates formed the basis of the hydraulic evaluation. The model was revised by adding in additional cross-sections at the location of Desert Hills Drive crossing of Skunk Creek. The revised model commences at Cross-Section No. 18.72 approximately 9,600 feet downstream of Desert Hills Drive and extends to Cross-Section No. 21.24 approximately 3,600 feet upstream of Desert Hills Drive and is presented as the revised existing condition model (Appendix B). The revised existing condition model was revised to model the proposed box culvert and is also presented in Appendix B.

What is the approximate location of the culvert ???

4. Topography (scale-1"=40' with 1 foot contour Internal), obtained from Maricopa County Department of Transportation, was utilized to determine cross-section input data for the HEC-2 model (Appendix C).

5. Output data from the HEC-2 models (existing and proposed), formed the basis for estimating potential scour at the Desert Hills crossing of Skunk Creek.

6. Procedures outlined in "Computing Degradation and Local Scour" by the U.S. Department of Interior, Bureau of Reclamation" were used to estimate scour depths.

7. The regime approach was used to estimate degradation upstream of the crossing and the rational approach was used to estimate downstream scour potential. Downstream scour was evaluated assuming the Desert Hills Drive and

proposed scour counter measure functions as a grade control structure (Appendix D).

8. Sediment gradations for scour calculations were taken from "Report of Geotechnical Investigation" by Speedie and Associates (September 20, 1995). Portions of report are included as Appendix E.

3.0 EXISTING CONDITIONS

Currently the Desert Hills Drive/Skunk Creek crossing consists of a dipped (at grade) roadway section at Skunk Creek. This area is periodically washed out or flooded during flow events. The estimated depth of flow at the crossing during the 100-year event is 8 to 10 feet or an average water surface elevation of 1855.6'. bet^n x-sections @. 20.533 & 20.55

4.0 HYDRAULIC ANALYSIS

Hydraulic analysis was conducted using the U.S. Army Corps of Engineers HEC-2 hydraulic modeling program. As previously mentioned, a revised existing condition HEC-2 model was developed to determine existing hydraulic conditions at the Desert Hills Drive/Skunk Creek Crossing. The revised existing condition HEC-2 model was modified to include the cross sections necessary for modeling the box culvert crossing and used as a proposed model. The "normal bridge" HEC-2 methodology was used to model the roadway/box culvert crossing. This is appropriate due to the high level of submergence over the top of road and a large percentage of flow in the overbank. This methodology was confirmed by telephone calls to the Army Corps of Engineers' Hydraulic Engineering Center in Davis, California and to Dodson and Associates, the HEC-2 software supplier. Both models use a starting water surface elevation of 1766.0 for the 100-year event which was provided in the previous F.I.S. study. The starting water surface elevation for the low flow event was estimated and adjusted after each

Water Surface Elevation Summary

Table 4.1

DATE: *March 28, 1996*

Section	Existing 100-Year WSEL (ft)	Proposed 100-Year WSEL (ft)	(Change in WSEL) Proposed - Existing Δ
18.720	1768.79	1768.79	*0.00*
18.950	1781.30	1781.30	*0.00*
19.160	1789.96	1789.96	*0.00*
19.380	1800.00	1800.00	*0.00*
19.580	1812.86	1812.86	*0.00*
19.920	1826.07	1826.07	*0.00*
20.230	1841.26	1841.26	*0.00*
20.390	1849.79	1849.79	*0.00*
20.530	1854.69	1854.64	*-0.05*
20.533	1856.00	1855.44	*-0.56*
20.540		1856.97	*N/A*
20.544		1856.86	*N/A*
20.550	1857.23	1856.66	*-0.57*
20.555		1858.12	*N/A*
20.730	1865.18	1865.1	*-0.08*
21.000	1878.68	1878.81	*0.13*
21.2400	1889.09	1888.99	*-0.10*

run of the model until the model converged upon a water surface elevation of 1764.6. Table 4.1 summarizes the results of the revised existing HEC-2 conditions hydraulic model and the proposed HEC-2 conditions hydraulic model.

5.0 CONCLUSIONS

The following drainage improvements will accommodate drainage concerns which are a result of the inadequacy of the existing Desert Hills Drive/Skunk Creek crossing.

1. The proposed culvert was sized to pass low flow events and will be submerged during the 100-year storm event. The culvert will convey an estimated 1800 cfs before overtopping of Desert Hills Drive occurs. The proposed box culvert will not raise the 100-year water surface elevation by more than the one foot maximum as required by FFMA. spell

2. The proposed pavement section at the Desert Hills Drive/Skunk Creek crossing will be in a dip section, 50' wide with a 2.0% cross slope. Armoring of the roadway section at the crossing will allow the 100-year event to overtop the box and cross the dip section without washing out the roadway.

3. Scour protection at the upstream and downstream locations of the box culvert will protect against erosion during high runoff events. The cutoff wall at the downstream end of the box culvert is proposed to be at a depth of 10 feet below culvert invert. The cutoff wall at the upstream end of the box culvert is proposed to be at a depth of 9 feet below the culvert inlet.

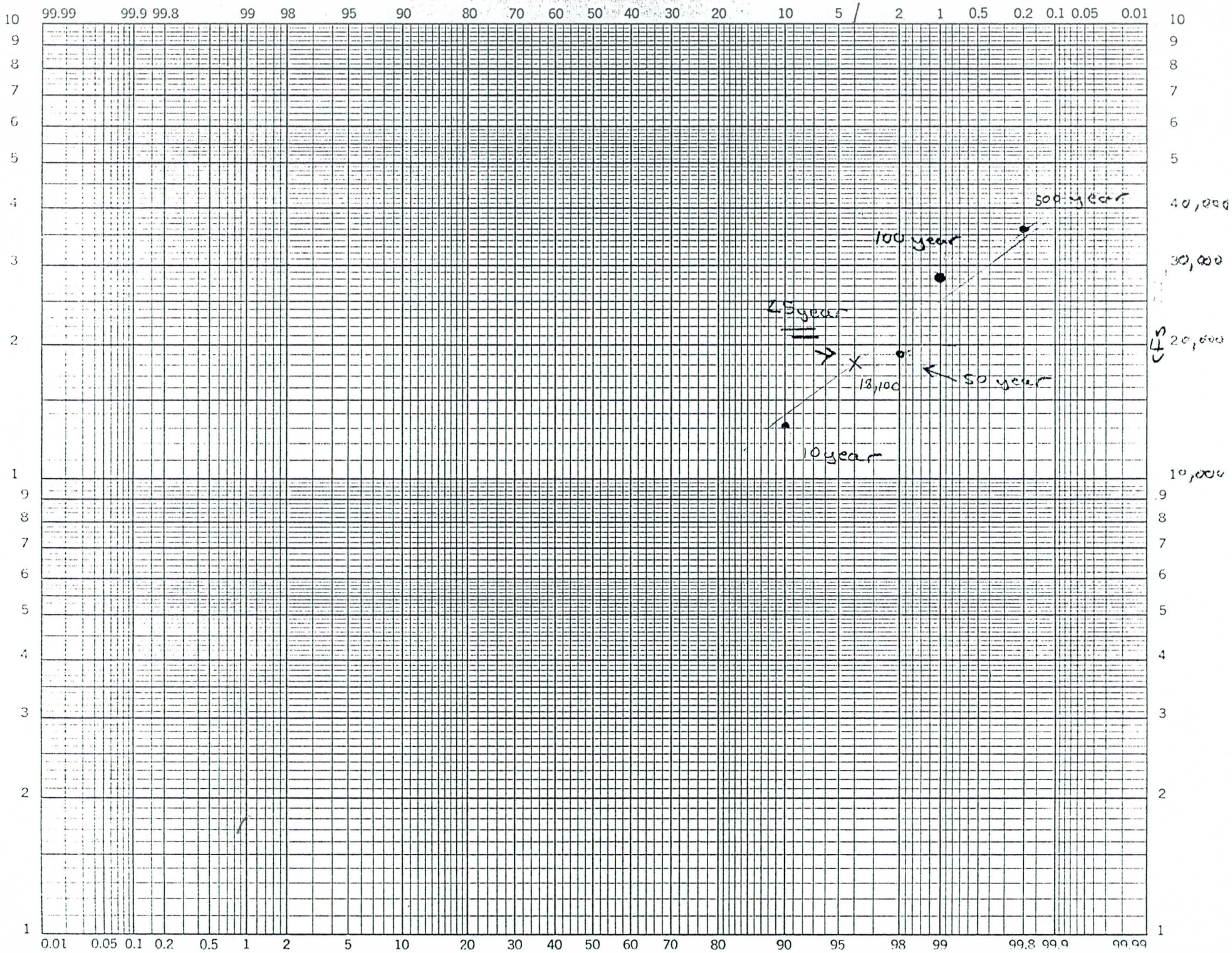
APPENDIX A

Probability Plot

[redacted] # 241146-02-000 Probability Plot | Skunk Creek Discharges At Desert Hills Drive |

K&E PROBABILITY X 2 LOG CYCLES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 8040



APPENDIX B

HEC-2 (Output for Multiple Profile Runs)

Existing Conditions Model

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
    *
 *                                        *
    *
 *  Version   4.6.2;  May 1991            *
       *
 *                                        *
     *
 *  RUN DATE    28MAR96    TIME   13:39:30  *
          *
*****************************************
```

```
*************************************
 *  U.S. ARMY CORPS OF ENGINEERS
 *  HYDROLOGIC ENGINEERING CENTER
 *  609 SECOND STREET, SUITE D
 *  DAVIS, CALIFORNIA 95616-4687
 *          (916) 756-1104
*************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1
28MAR96 13:39:30 PAGE 1

THIS RUN EXECUTED 28MAR96 13:39:30

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

```
T1      Skunk Creek at Desert Hills Drive - Existing Condition
T2      Nuisance, 10, 25, 50, and 100 yr        File: DESEXI
T3         CBA # 241746-02-0300                  11/2/95

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0         2                           0                           0      1766

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1                 -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43         1         2        26        39        21        22        27        28
     53        54         0        38        13        14        15        55        26        56
     63         1        52         4        42        57                  38        39        33
      3        10        11        12         5         7         8        16        17        18

NC    .050      .050      .048      .300      .500
QT       5       900     13100     18100     19100     28100

X1   18.72        16      9450     10220         0         0         0
GR    1780      9350      1776      9420      1768      9450      1766      9460      1764      9960
GR    1760      9980      1760     10000      1764     10020      1764     10160      1768     10220
```

```
GR     1766      10350      1768      10500      1768      10620      1772      10940      1776      11430
GR     1780      11760

X1    18.95         26      9260      10050      1200       1200      1214
GR     1796       8870      1792       9090      1788       9130      1784       9180      1780       9260
GR     1776       9350      1774       9370      1776       9400      1778       9420      1776       9460
GR     1774       9480      1776       9510      1780       9650      1780       9850      1776       9900
GR     1772       9950    1771.5       9970    1771.5      10000    1771.5      10010      1772      10030
GR     1780      10050      1782      10300    1780.5      10550      1784      10880      1788      11310
GR     1792      11680

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   28MAR96      13:39:30                                                                          PAGE     2

X1    19.16         41      9900      10580      1100       1040      1109
GR   1805.5       9220      1808       9330      1804       9410      1800       9450      1796       9490
GR     1788       9600      1787       9650      1787       9720      1788       9770    1789.5       9840
GR     1788       9900      1785       9930      1785       9970      1786       9980      1786      10000
GR     1784      10020      1784      10030    1784.5      10060      1784      10160      1782      10170
GR     1784      10190      1786      10260      1784      10330      1783      10340      1784      10360
GR     1785      10380      1784      10400      1786      10460      1784      10510      1782      10520
GR     1782      10560      1784      10565      1788      10580      1792      10690      1793      10820
GR   1792.5      10960      1793      11060      1792      11130      1792      11180      1796      11580
GR     1800      11700

NC     .045       .045      .043       .300      .500

X1    19.38         27      9960      10660      1180       1150      1162
GR     1820       8750      1816       8870      1812       8930      1808       8970      1804       9050
GR     1800       9690      1800       9730      1802       9890      1800       9960      1792       9980
GR     1792      10000      1792      10010      1796      10020      1798      10050      1798      10150
GR     1796      10180      1794      10310      1796      10350      1799      10410      1796      10500
GR     1796      10630      1800      10660      1804      10840      1808      11030      1842      11240
GR     1816      11470    1816.5      11660

X1    19.58         23      9650      10380      1110       1100      1056
GR     1832       8320      1828       8670      1820       8810      1816       8940      1815       9070
GR     1813       9140    1813.5       9530      1812       9650      1809       9740      1810       9800
GR     1808       9880      1806       9970    1804.5       9980    1804.5      10000    1804.5      10020
GR     1808      10040      1808      10140      1805      10180      1808      10250      1812      10380
GR     1816      10510      1820      10680      1824      11080

X1    19.92         34      8920      10090      1330       1840      1795
GR     1840       8430      1836       8590      1828       8670      1824       8820      1820       8850
GR     1824       8920      1824       9000      1822       9020      1824       9030      1824       9200
GR     1822       9220      1822       9250      1824       9280      1823       9380      1823       9550
GR     1820       9600      1820       9620      1824       9630      1824       9660      1824       9690
GR     1822       9730      1823       9800      1823       9890      1822       9940      1820       9970
GR     1816       9980    1815.5      10000      1816      10015      1820      10030      1824      10090
GR     1828      10110      1832      10200      1836      10500      1840      10640

X1    20.23         35      9310      10070      1670       1630      1637
GR   1851.5       8120      1852       8240      1854       8430      1854       8610      1852       8770
GR     1848       8870      1844       8900      1840       8960      1838       9000      1840       9310
GR     1840       9430      1837       9460      1838       9470    1839.5       9560      1840       9600
GR   1840.5       9640      1840       9670      1835       9680      1835       9710      1836       9720
GR     1840       9820      1836       9950      1834       9960      1834      10000      1834      10020
GR     1836      10030      1840      10050      1838      10070      1838      10130      1840      10170
GR     1844      10290      1848      10530      1852      10870      1856      11090      1860      11300

1
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```
X1    20.39      23     9500    10340     1100      550      845
GR     1864    8950     1860     9140     1848     9220   1846.5     9300     1847     9430
GR     1845    9500     1847     9660     1847     9940     1844     9950     1842     9970
GR     1842   10000     1842    10020     1844    10030     1848    10110     1848    10210
GR     1844   10310     1844    10340     1843    10360     1844    10370     1848    10420
GR     1852   10600     1856    10830     1860    11100

X1    20.53      30     9961    10090      990      540      740
GR     1856    9160     1855     9317     1854     9337     1853     9360     1852     9382
GR     1852    9397     1853     9414     1853     9772     1851     9849     1851     9858
GR     1852    9912     1852     9948     1852     9961   1845.5     9989   1845.5    10000
GR   1845.5   10025   1845.5    10035   1845.5    10053     1849    10075     1853    10090
GR     1853   10101     1852    10114     1851    10293   1850.2    10409     1851    10473
GR   1851.5   10497   1853.4    10579   1854.4    10618   1855.8    10698   1856.8    10773

NC    0.045    0.045    0.016

X1   20.533      31     9949    10090       16       16       16
GR     1857    9115     1856     9190     1855     9320     1854     9336     1853     9360
GR     1852    9380     1852     9385     1853     9410     1853     9780     1853     9812
GR     1854    9867     1854     9949     1846     9966     1845     9988     1846    10000
GR   1845.2   10012     1846    10025     1846    10035     1846    10053     1849    10075
GR     1853   10090     1853    10101     1852    10114     1851    10273     1851    10360
GR     1851   10420     1853    10497     1854    10579     1855    10618     1856    10698
GR     1857   10773

X1    20.55      33     9973    10079       90       90       90
GR   1857.5    9172     1857     9232     1857     9359     1854     9383     1853     9432
GR   1854.5    9465     1855     9740   1852.3     9802     1855     9880     1853     9892
GR     1852    9910     1851     9926     1851     9930     1852     9943     1852     9965
GR     1852    9973   1848.1     9988   1848.1    10000   1848.1    10012  1848.15    10065
GR     1853   10079     1853    10140     1854    10165     1853    10175     1852    10235
GR     1851   10280     1851    10375   1852.3    10425     1855    10543     1856    10601
GR     1857   10647     1858    10725     1858    10740

NC    0.045    0.045    0.042       .3       .5

X1    20.73      31     9440    10110      702     1002      947
GR     1876    8350     1872     8450     1868     8560     1865     8640     1865     8710
GR     1865    8780     1866     8970     1865     9060     1866     9120     1864     9230
GR     1862    9440     1861     9480     1862     9540     1863     9720     1860     9930
GR     1856    9960     1855     9970     1855    10000     1856    10015     1860    10020
GR     1864   10040     1865    10110     1865    10220     1864    10280   1863.5    10300
GR     1864   10320     1864    10380     1868    10420     1872    10490     1876    10570
GR     1880   10720
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1


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X1       21      23     9400    10070     1290     1530     1426
GR     1884    8300     1880     8670     1878     8720     1879     8830     1879     9120
GR     1876    9200     1873     9240     1876     9400     1876     9800     1875     9920
GR     1872    9940   1868.5     9960   1868.5    10000   1865.5    10030     1876    10060
GR     1878   10070     1877    10330     1880    10590     1884    10840     1888    10950
GR     1892   11040     1896    11300     1900    11520

NC     .050    .050     .048     .300     .500
```

```
X1    21.24        29       9570      10230       1370       1250       1267
GR     1900      8930       1896       9110       1892       9470       1888       9570       1884       9660
GR     1882      9680       1884       9700       1883       9730       1884       9740     1885.5       9800
GR     1884      9850       1886       9880       1886       9930       1884       9950       1884       9970
GR     1880      9990     1879.5      10000       1880      10010       1884      10030       1887      10060
GR     1884     10090       1880      10110       1880      10130       1884      10170       1888      10230
GR     1892     10450       1892      10710       1896      10930       1900      11100
1
   28MAR96      13:39:30                                                                                PAGE    5

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *PROF 1
0

 CCHV=     .300 CEHV=     .500
 *SECNO 18.720
    18.720      6.00   1766.00        .00   1766.00   1766.01        .01        .00        .00   1768.00
     900.0        .0     900.0         .0        .0    1090.0         .0        .0         .0   1768.00
       .00       .00       .83        .00      .000      .048       .000       .000    1760.00   9460.00
   .000417        0.        0.         0.         0         0          0        .00     730.00  10190.00

 *SECNO 18.950

 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
    18.950      1.68   1773.18   1773.18        .00   1773.87        .69       1.62        .34   1780.00
     900.0        .0     900.0         .0        .0     134.6         .0       17.1       11.5   1780.00
       .05       .00      6.69        .00      .000      .048       .000       .000    1771.50   9935.28
   .030526     1200.     1214.     1200.        20        14          0        .00      97.66  10032.94

 *SECNO 19.160

 3265 DIVIDED FLOW

 3301 HV CHANGED MORE THAN HVINS

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.52

    19.160      2.92   1784.92        .00        .00   1785.00        .07      10.94        .19   1788.00
     900.0        .0     900.0         .0        .0     420.1         .0       24.1       18.1   1788.00
       .19       .00      2.14        .00      .000      .048       .000       .000    1782.00  10010.74
   .004812     1100.     1109.     1040.         8         0          0        .00     420.46  10568.47

 CCHV=     .300 CEHV=     .500
 *SECNO 19.380
1
   28MAR96      13:39:30                                                                                PAGE    6

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST
```

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

19.380	3.03	1795.03	.00	.00	1795.53	.50	10.32	.22	1800.00
900.0	.0	900.0	.0	.0	158.3	.0	31.8	25.5	1800.00
.25	.00	5.69	.00	.000	.043	.000	.000	1792.00	9972.44
.021558	1180.	1162.	1150.	6	0	0	.00	132.26	10330.50

*SECNO 19.580

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.79

19.580	2.66	1807.16	.00	.00	1807.34	.18	11.72	.10	1812.00
900.0	.0	900.0	.0	.0	262.3	.0	36.9	29.5	1812.00
.34	.00	3.43	.00	.000	.043	.000	.000	1804.50	9917.62
.006749	1110.	1056.	1100.	5	0	0	.00	196.94	10230.49

*SECNO 19.920

19.920	3.79	1819.29	.00	.00	1819.80	.51	12.29	.16	1824.00
900.0	.0	900.0	.0	.0	157.8	.0	45.6	34.7	1824.00
.42	.00	5.70	.00	.000	.043	.000	.000	1815.50	9971.77
.006947	1330.	1795.	1840.	4	0	0	.00	55.57	10027.34

*SECNO 20.230

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .66

20.230	1.92	1835.92	.00	.00	1836.38	.46	16.57	.01	1840.00
900.0	.0	900.0	.0	.0	166.1	.0	51.7	38.0	1838.00
.51	.00	5.42	.00	.000	.043	.000	.000	1834.00	9678.16
.016087	1670.	1637.	1630.	4	0	0	.00	120.20	10029.59

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 20.390

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.52

20.390	2.64	1844.64	.00	.00	1844.85	.21	8.40	.07	1845.00
900.0	.0	793.4	106.6	.0	210.7	36.9	55.6	40.8	1844.00
.57	.00	3.77	2.89	.000	.043	.045	.000	1842.00	9947.86
.006986	1100.	845.	550.	4	0	0	.00	179.09	10378.03

```
*SECNO 20.530
   20.530      2.89   1848.39       .00       .00   1848.63       .24      3.77       .01   1852.00
    900.0        .0     900.0        .0        .0     229.5        .0      59.5      43.0   1853.00
      .62       .00      3.92       .00      .000      .043      .000      .000   1845.50   9976.54
  .003983      990.      740.      540.         5         0         0       .00     94.65  10071.19


*SECNO 20.533

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.23

   20.533      3.50   1848.50       .00       .00   1848.67       .17       .01       .02   1854.00
    900.0        .0     900.0        .0        .0     273.0        .0      59.6      43.0   1853.00
      .62       .00      3.30       .00      .000      .016      .000      .000   1845.00   9960.71
  .000381       16.       16.       16.         1         0         0       .00    110.55  10071.26


*SECNO 20.550

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.550      1.59   1849.69   1849.69       .00   1850.44       .75       .08       .29   1852.00
    900.0        .0     900.0        .0        .0     129.5        .0      60.0      43.3   1853.00
      .63       .00      6.95       .00      .000      .016      .000      .000   1848.10   9981.88
  .003343       90.       90.       90.        20        14         0       .00     87.57  10069.45


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   28MAR96      13:39:30                                                                          PAGE     8

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


CCHV=     .300 CEHV=     .500
*SECNO 20.730
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.730      2.25   1857.25   1857.25       .00   1858.15       .90      6.51       .07   1862.00
    900.0        .0     900.0        .0        .0     118.3        .0      62.7      44.9   1865.00
      .66       .00      7.61       .00      .000      .042      .000      .000   1855.00   9950.60
  .021500      702.      947.     1002.         4        11         0       .00     65.96  10016.57


*SECNO 21.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.16

   21.000      4.85   1870.35       .00       .00   1870.61       .27     12.27       .19   1876.00
    900.0        .0     900.0        .0        .0     216.9        .0      68.2      47.5   1878.00
      .76       .00      4.15       .00      .000      .042      .000      .000   1865.50   9949.49
  .004603     1290.     1426.     1530.         8         0         0       .00     94.34  10043.83


CCHV=     .300 CEHV=     .500
*SECNO 21.240
```

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .40

21.240	2.48	1881.98	1881.95	.00	1882.69	.71	11.85	.22	1888.00
900.0	.0	900.0	.0	.0	133.2	.0	73.3	50.2	1888.00
.81	.00	6.76	.00	.000	.048	.000	.000	1879.50	9980.10
.028354	1370.	1267.	1250.	10	8	0	.00	89.49	10149.79

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T1 SKUNK CREEK WASH
T2 25 YEAR FREQUENCY
T3 SKUNK CREEK

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-10	3			.01				1766	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2		-1							

1

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 2

CCHV= .300 CEHV= .500
*SECNO 18.720

3265 DIVIDED FLOW

18.720	7.34	1767.34	.00	1766.00	1767.92	.57	.00	.00	1768.00
13100.0	.0	12810.4	289.6	.0	2087.6	126.1	.0	.0	1768.00
.00	.00	6.14	2.30	.000	.048	.050	.000	1760.00	9453.29
.010174	0.	0.	0.	0	0	4	.00	944.71	10450.64

*SECNO 18.950

3265 DIVIDED FLOW

18.950	7.76	1779.26	.00	.00	1780.01	.76	12.01	.09	1780.00
13100.0	.0	13100.0	.0	.0	1877.6	.0	57.0	20.6	1780.00
.05	.00	6.98	.00	.000	.048	.000	.000	1771.50	9276.47
.009623	1200.	1214.	1200.	3	0	0	.00	536.94	10048.17

*SECNO 19.160

3265 DIVIDED FLOW

19.160	6.00	1788.00	.00	.00	1788.46	.46	8.36	.09	1788.00
13100.0	238.9	12861.1	.0	121.3	2342.8	.0	112.2	38.3	1788.00
.11	1.97	5.49	.00	.050	.048	.000	.000	1782.00	9599.89

.006065	1100.	1109.	1040.	5	0	0	.00	851.00	10580.21

CCHV= .300 CEHV= .500
*SECNO 19.380

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

19.380	6.65	1798.65	.00	.00	1799.65	1.00	10.91	.27	1800.00
13100.0	.0	13100.0	.0	.0	1634.2	.0	166.9	58.6	1800.00
.15	.00	8.02	.00	.000	.043	.000	.000	1792.00	9963.37
.016442	1180.	1162.	1150.	3	0	0	.00	669.19	10649.90

*SECNO 19.580

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

19.580	6.48	1810.98	.00	.00	1811.64	.66	11.89	.10	1812.00
13100.0	.0	13100.0	.0	.0	2008.0	.0	211.1	74.8	1812.00
.19	.00	6.52	.00	.000	.043	.000	.000	1804.50	9680.71
.008194	1110.	1056.	1100.	3	0	0	.00	666.02	10346.73

*SECNO 19.920

19.920	9.27	1824.77	.00	.00	1825.13	.36	13.40	.09	1824.00
13100.0	1526.6	11571.3	2.2	288.3	2446.2	1.5	307.3	114.6	1824.00
.29	5.30	4.73	1.45	.045	.043	.045	.000	1815.50	8791.07
.007031	1330.	1795.	1840.	8	0	0	.00	1302.78	10093.86

*SECNO 20.230

3265 DIVIDED FLOW

20.230	6.20	1840.20	.00	.00	1840.82	.62	15.56	.13	1840.00
13100.0	1827.7	10204.5	1067.8	421.5	1535.8	181.0	399.1	161.4	1838.00
.37	4.34	6.64	5.90	.045	.043	.045	.000	1834.00	8956.95
.013486	1670.	1637.	1630.	5	0	0	.00	1177.65	10176.10

*SECNO 20.390

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

20.390	6.42	1848.42	.00	.00	1848.81	.40	7.92	.07	1845.00
13100.0	1947.5	9393.2	1759.4	480.1	1906.1	272.4	446.8	185.9	1844.00
.41	4.06	4.93	6.46	.045	.043	.045	.000	1842.00	9217.21
.006829	1100.	845.	550.	4	0	0	.00	1221.59	10438.81

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 20.530

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.530	7.75	1853.25	1853.25	.00	1854.22	.98	5.08	.29	1852.00
13100.0	1216.5	7650.9	4232.7	408.6	787.4	915.4	487.1	207.8	1853.00
.44	2.98	9.72	4.62	.045	.043	.045	.000	1845.50	9354.32
.007201	990.	740.	540.	3	11	0	.00	1218.07	10572.39

*SECNO 20.533

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.533	8.94	1853.94	1853.94	.00	1855.43	1.49	.04	.26	1854.00
13100.0	520.1	10550.4	2029.5	487.3	970.5	1034.8	487.9	208.2	1853.00
.44	1.07	10.87	1.96	.045	.016	.045	.000	1845.00	9337.44
.001071	16.	16.	16.	20	11	0	.00	1151.20	10574.08

*SECNO 20.550
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.550	7.16	1855.26	1855.26	.00	1856.65	1.39	.11	.03	1852.00
13100.0	1493.0	8201.9	3405.1	796.4	693.7	1311.1	493.4	210.6	1853.00
.44	1.87	11.82	2.60	.045	.016	.045	.000	1848.10	9372.92
.001346	90.	90.	90.	20	15	0	.00	1185.12	10558.04

CCHV= .300 CEHV= .500
*SECNO 20.730
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
1

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

20.730	8.47	1863.47	1863.47	.00	1864.61	1.14	3.12	.08	1862.00
13100.0	414.7	12685.3	.0	113.7	1461.4	.0	539.3	229.9	1865.00
.47	3.65	8.68	.00	.045	.042	.000	.000	1855.00	9285.45
.018347	702.	947.	1002.	20	12	0	.00	751.91	10037.36

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*SECNO 21.000

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.82

    21.000     11.93   1877.43       .00       .00   1877.85       .42     13.02       .22   1876.00
   13100.0    3008.5   10062.9      28.6     613.6    1902.4      32.3     605.7     259.0   1878.00
       .55      4.90      5.29       .89      .045      .042      .045      .000   1865.50   9161.83
   .005556     1290.     1426.     1530.         4         0         0       .00   1054.92  10367.40


CCHV=      .300 CEHV=      .500
*SECNO 21.240

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .70

    21.240      7.65   1887.15       .00       .00   1887.89       .74      9.88       .16   1888.00
   13100.0        .0   13100.0        .0        .0    1896.2        .0     671.0     283.8   1888.00
       .60       .00      6.91       .00      .000      .048      .000      .000   1879.50   9589.08
   .011472     1370.     1267.     1250.         5         0         0       .00    628.19  10217.28


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   28MAR96      13:39:30                                                                          PAGE   14


 T1       SKUNK CREEK WASH
 T2       50 YEAR FREQUENCY
 T3       SKUNK CREEK

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -10       4                           .01                                     1766

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       3                 -1


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   28MAR96      13:39:30                                                                          PAGE   15

     SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
     Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
     TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
     SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


 *PROF 3

 CCHV=      .300 CEHV=      .500
 *SECNO 18.720

 3265 DIVIDED FLOW

    18.720      7.93   1767.93       .00   1766.00   1768.63       .70       .00       .00   1768.00
   18100.0        .0   17348.1     751.9        .0    2532.5     259.5        .0        .0   1768.00
       .00       .00      6.85      2.90      .000      .048      .050      .000   1760.00   9450.37
   .010002        0.        0.        0.         0         0         4       .00   1038.05  10494.40


 *SECNO 18.950
```

18.950	8.87	1780.37	.00	.00	1781.13	.76	12.48	.03	1780.00
18100.0	1.4	18089.9	8.7	1.4	2584.6	8.7	75.0	26.2	1780.00
.05	1.00	7.00	1.00	.050	.048	.050	.000	1771.50	9252.54
.010567	1200.	1214.	1200.	7	0	0	.00	844.07	10096.62

*SECNO 19.160

3265 DIVIDED FLOW

19.160	6.82	1788.82	.00	.00	1789.35	.53	8.15	.07	1788.00
18100.0	803.8	17285.0	11.2	293.5	2895.9	9.3	148.7	49.0	1788.00
.10	2.74	5.97	1.21	.050	.048	.050	.000	1782.00	9588.71
.005405	1100.	1109.	1040.	5	0	0	.00	955.04	10602.58

CCHV= .300 CEHV= .500
*SECNO 19.380

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

19.380	7.08	1799.08	1798.99	.00	1800.45	1.37	10.68	.42	1800.00
18100.0	.0	18100.0	.0	.0	1925.9	.0	217.1	71.0	1800.00
.14	.00	9.40	.00	.000	.043	.000	.000	1792.00	9962.30
.018945	1180.	1162.	1150.	6	8	0	.00	690.81	10653.11

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 19.580

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.59

19.580	7.30	1811.80	.00	.00	1812.57	.77	11.94	.18	1812.00
18100.0	.0	18100.0	.0	.0	2578.6	.0	271.7	88.1	1812.00
.18	.00	7.02	.00	.000	.043	.000	.000	1804.50	9655.97
.007506	1110.	1056.	1100.	4	0	0	.00	717.57	10373.54

*SECNO 19.920

19.920	9.70	1825.20	.00	.00	1825.67	.46	13.01	.09	1824.00
18100.0	2007.5	16085.2	7.2	348.4	2959.3	3.7	391.2	129.3	1824.00
.27	5.76	5.44	1.98	.045	.043	.045	.000	1815.50	8774.63
.007202	1330.	1795.	1840.	6	0	0	.00	1321.42	10096.05

*SECNO 20.230

20.230	6.65	1840.65	1840.41	.00	1841.38	.73	15.58	.13	1840.00
18100.0	3076.3	13505.4	1518.4	583.5	1875.0	232.3	504.3	177.6	1838.00
.33	5.27	7.20	6.54	.045	.043	.045	.000	1834.00	8950.13
.013086	1670.	1637.	1630.	13	18	0	.00	1239.61	10189.74

*SECNO 20.390

```
   20.390      6.90   1848.90       .00       .00   1849.39       .50      7.94       .07   1845.00
  18100.0    2911.8   12989.4    2198.8     616.2    2308.1     324.8     563.6     202.8   1844.00
     .38      4.73      5.63      6.77      .045      .043      .045      .000   1842.00   9214.02
 .006900     1100.      845.      550.         4         0         0       .00   1246.33  10460.35


*SECNO 20.530

3301 HV CHANGED MORE THAN HVINS

   20.530      8.32   1853.82       .00       .00   1854.83      1.01      5.18       .26   1852.00
  18100.0    2755.1    8929.7    6415.2     761.6     861.6    1199.8     615.6     225.2   1853.00
     .40      3.62     10.36      5.35      .045      .043      .045      .000   1845.50   9341.08
 .007264      990.      740.      540.         3         0         0       .00   1254.39  10595.48


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  28MAR96      13:39:30                                                                          PAGE   17

   SECNO     DEPTH     CWSEL     CRIWS     WSELK        EG        HV        HL     OLOSS   L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB       ACH      AROB       VOL       TWA   R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH       XNR       WTN     ELMIN      SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL     IDC     ICONT     CORAR    TOPWID      ENDST


*SECNO 20.533

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.533      9.75   1854.75   1854.75       .00   1856.41      1.66       .04       .33   1854.00
  18100.0    1551.7   13107.6    3440.8     983.4    1084.8    1441.8     616.8     225.7   1853.00
     .40      1.58     12.08      2.39      .045      .016      .045      .000   1845.00   9324.00
 .001142       16.       16.       16.        20        11         0       .00   1284.26  10608.26


*SECNO 20.550
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.550      7.91   1856.01   1856.01       .00   1857.57      1.56       .12       .03   1852.00
  18100.0    2833.6   10165.8    5100.7    1247.7     773.0    1685.9     624.2     228.3   1853.00
     .41      2.27     13.15      3.03      .045      .016      .045      .000   1848.10   9366.94
 .001441       90.       90.       90.        20        15         0       .00   1234.42  10601.36


CCHV=     .300 CEHV=     .500
*SECNO 20.730

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.730      9.09   1864.09   1864.09       .00   1865.38      1.28      3.16       .08   1862.00
  18100.0    1013.3   17053.9      32.8     229.7    1833.4      19.6     684.1     249.9   1865.00
     .44      4.41      9.30      1.68      .045      .042      .045      .000   1855.00   9224.90
 .015888      702.      947.     1002.        20        11         0       .00    928.07  10380.93


*SECNO 21.000

3265 DIVIDED FLOW

1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.63

21.000	12.45	1877.95	.00	.00	1878.50	.55	12.90	.22	1876.00
18100.0	4136.3	13722.5	241.2	740.1	2247.5	155.7	768.3	285.3	1878.00
.50	5.59	6.11	1.55	.045	.042	.045	.000	1865.50	9148.06
.005958	1290.	1426.	1530.	8	0	0	.00	1250.23	10412.14

CCHV= .300 CEHV= .500
*SECNO 21.240

21.240	8.39	1887.89	.00	.00	1888.80	.91	10.12	.18	1888.00
18100.0	.0	18100.0	.0	.0	2370.5	.0	849.4	313.3	1888.00
.55	.00	7.64	.00	.000	.048	.000	.000	1879.50	9572.46
.011021	1370.	1267.	1250.	5	0	0	.00	655.89	10228.36

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T1 SKUNK CREEK WASH
T2 100 YEAR FREQUENCY
T3 SKUNK CREEK

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-10	5			.01				1766	
J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	4		-1							

1
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 4

CCHV= .300 CEHV= .500
*SECNO 18.720

18.720	8.04	1768.04	.00	1766.00	1768.76	.72	.00	.00	1768.00
19100.0	.0	18216.7	883.3	.0	2620.4	295.8	.0	.0	1768.00
.00	.03	6.95	2.99	.000	.048	.050	.000	1760.00	9449.85
.009870	0.	0.	0.	0	0	3	.00	1173.30	10623.15

*SECNO 18.950

18.950	8.97	1780.47	.00	.00	1781.26	.80	12.46	.04	1780.00

```
  19100.0      2.5   19081.6      15.9       2.2    2659.1      13.6      77.9      28.2   1780.00
      .05     1.16      7.18      1.17      .050      .048      .050      .000   1771.50   9250.66
 .010696    1200.     1214.     1200.         4         0         0       .00    857.74  10108.40


*SECNO 19.160

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

   19.160      6.95   1788.95       .00       .00   1789.50       .55      8.16       .07   1788.00
  19100.0     934.1   18149.2      16.7     328.1    2986.8      12.5     154.2      51.4   1788.00
      .10      2.85      6.08      1.33      .050      .048      .050      .000   1782.00   9586.87
 .005376     1100.     1109.     1040.         5         0         0       .00    972.14  10606.26


CCHV=     .300 CEHV=     .500
*SECNO 19.380

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .53

   19.380      7.17   1799.17   1799.10       .00   1800.60      1.43     10.66       .44   1800.00
  19100.0        .0   19100.0        .0        .0    1987.5        .0     225.2      73.7   1800.00
      .13       .00      9.61       .00      .000      .043      .000      .000   1792.00   9962.08
 .019028     1180.     1162.     1150.         6         8         0       .00    691.70  10653.78


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   28MAR96      13:39:30                                                                          PAGE   21

   SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
   Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
   TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
   SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 19.580

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.60

   19.580      7.44   1811.94       .00       .00   1812.73       .79     11.93       .19   1812.00
  19100.0        .0   19100.0        .0        .0    2679.1        .0     281.7      90.9   1812.00
      .17       .00      7.13       .00      .000      .043      .000      .000   1804.50   9651.79
 .007476     1110.     1056.     1100.         4         0         0       .00    726.28  10378.06


*SECNO 19.920
   19.920      9.79   1825.29       .00       .00   1825.78       .48     12.96       .09   1824.00
  19100.0    2103.9   16987.4       8.7     361.3    3061.4       4.2     405.6     132.3   1824.00
      .26      5.82      5.55      2.07      .045      .043      .045      .000   1815.50   8771.36
 .007174     1330.     1795.     1840.         6         0         0       .00   1325.13  10096.49


*SECNO 20.230
   20.230      6.72   1840.72   1840.48       .00   1841.49       .76     15.57       .14   1840.00
  19100.0    3308.1   14189.1   1602.8     609.4    1929.6     241.0     522.6     180.8   1838.00
      .33      5.43      7.35      6.65      .045      .043      .045      .000   1834.00   8949.05
 .013128     1670.     1637.     1630.        13        18         0       .00   1242.84  10191.89
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*SECNO 20.390
   20.390      6.98   1848.98       .00       .00   1849.49       .51      7.93       .07   1845.00
  19100.0    3110.2   13704.0    2285.8     643.1    2387.0     336.3     583.9     206.0   1844.00
      .37      4.84      5.74      6.80      .045      .043      .045      .000   1842.00   9213.40
 .006867     1100.      845.      550.         3         0         0       .00   1251.17  10464.57


*SECNO 20.530

3301 HV CHANGED MORE THAN HVINS

   20.530      8.41   1853.91       .00       .00   1854.94      1.02      5.19       .26   1852.00
  19100.0    3087.3    9171.7    6841.1     821.8     874.1    1249.0     638.1     228.5   1853.00
      .40      3.76     10.49      5.48      .045      .043      .045      .000   1845.50   9338.85
 .007304      990.      740.      540.         3         0         0       .00   1260.40  10599.26


1                                                                                                  PAGE   22
   28MAR96      13:39:30

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*SECNO 20.533

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.533      9.89   1854.89   1854.89       .00   1856.58      1.69       .04       .33   1854.00
  19100.0    1787.7   13583.7    3728.6    1072.0    1104.7    1515.6     639.3     229.0   1853.00
      .40      1.67     12.30      2.46      .045      .016      .045      .000   1845.00   9321.73
 .001154       16.       16.       16.        20        11         0       .00   1292.04  10613.78


*SECNO 20.550
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.550      8.22   1856.32   1856.32       .00   1857.74      1.41       .11       .08   1852.00
  19100.0    3295.8   10281.8    5522.3    1439.3     806.4    1852.9     647.4     231.6   1853.00
      .40      2.29     12.75      2.98      .045      .016      .045      .000   1848.10   9364.41
 .001280       90.       90.       90.        20        10         0       .00   1251.46  10615.87


CCHV=      .300 CEHV=      .500
*SECNO 20.730

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.730      9.19   1864.19   1864.19       .00   1865.51      1.32      2.88       .03   1862.00
  19100.0    1165.8   17876.2      58.0     249.9    1890.1      29.8     711.9     253.6   1865.00
      .43      4.66      9.46      1.95      .045      .042      .045      .000   1855.00   9219.79
 .015997      702.      947.     1002.        20        11         0       .00    946.21  10381.86


*SECNO 21.000

3265 DIVIDED FLOW
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.64

21.000	12.55	1878.05	.00	.00	1878.62	.57	12.89	.23	1876.00
19100.0	4353.9	14418.0	328.1	767.6	2319.6	192.7	799.8	289.9	1878.00
.49	5.67	6.22	1.70	.045	.042	.045	.000	1865.50	8718.61
.005923	1290.	1426.	1530.	8	0	0	.00	1283.76	10421.47

CCHV= .300 CEHV= .500
*SECNO 21.240

21.240	8.50	1888.00	.00	.00	1888.95	.95	10.14	.19	1888.00
19100.0	.0	19100.0	.0	.0	2444.8	.0	883.9	318.4	1888.00
.54	.00	7.81	.00	.000	.048	.000	.000	1879.50	9569.91
.011165	1370.	1267.	1250.	5	0	0	.00	660.27	10230.19

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28MAR96 13:39:30 PAGE 24

T1 SKUNK CREEK WASH
T2 500 YEAR FREQUENCY
T3 SKUNK CREEK

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	-10	6			.01				1766	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	5		-1							

1
28MAR96 13:39:30 PAGE 25

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 5

CCHV= .300 CEHV= .500
*SECNO 18.720

18.720	8.79	1768.79	.00	1766.00	1769.72	.93	.00	.00	1768.00
28100.0	1.8	25613.3	2484.8	1.2	3199.7	621.8	.0	.0	1768.00
.00	1.57	8.00	4.00	.050	.048	.050	.000	1760.00	9447.03
.010026	0.	0.	0.	0	0	5	.00	1236.32	10683.35

```
*SECNO 18.950

3265 DIVIDED FLOW

   18.950      9.80   1781.30       .00       .00   1782.37      1.06     12.58       .07   1780.00
  28100.0      39.4   27672.8     387.8      17.0    3320.5     190.8     102.3      33.7   1780.00
      .04      2.31      8.33      2.03      .050      .048      .050      .000   1771.50   9233.91
  .010727     1200.     1214.     1200.         4         0         0       .00   1189.07  10625.85


*SECNO 19.160

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

   19.160      7.96   1789.96       .00       .00   1790.67       .71      8.19       .11   1788.00
  28100.0    2354.4   25632.3     113.4     635.9    3668.3      52.7     202.4      61.9   1788.00
      .09      3.70      6.99      2.15      .050      .048      .050      .000   1782.00   9573.09
  .005405     1100.     1109.     1040.         5         0         0       .00   1060.73  10633.82


CCHV=     .300 CEHV=     .500
*SECNO 19.380

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   19.380      8.00   1800.00   1800.00       .00   1801.86      1.86     10.46       .58   1800.00
  28100.0        .0   28100.0        .0        .0    2565.9        .0     294.9      86.0   1800.00
      .12       .04     10.95       .00      .045      .043      .000      .000   1792.00   9689.80
  .017866     1180.     1162.     1150.         3         5         0       .00    740.39  10660.05


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   28MAR96      13:39:30                                                                          PAGE   26

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 19.580

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.52

   19.580      8.36   1812.86       .00       .00   1813.94      1.08     11.84       .23   1812.00
  28100.0      49.0   28031.1      19.9      29.7    3351.4      12.1     367.1     105.1   1812.00
      .15      1.65      8.36      1.65      .045      .043      .045      .000   1804.50   9581.08
  .007687     1110.     1056.     1100.         5         0         0       .00    826.91  10408.00


*SECNO 19.920
   19.920     10.57   1826.07       .00       .00   1826.69       .62     12.61       .14   1824.00
  28100.0    2996.3   25074.7      28.9     486.7    3961.6      10.7     526.2     148.8   1824.00
      .23      6.16      6.33      2.71      .045      .043      .045      .000   1815.50   8742.50
  .006619     1330.     1795.     1840.         7         0         0       .00   1357.83  10100.33
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*SECNO 20.230

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

    20.230      7.26   1841.26   1841.10       .00   1842.33      1.07     15.42       .22   1840.00
   28100.0    5407.6   20311.9    2380.5     801.2    2329.2     309.2     675.0     198.3   1838.00
       .28      6.75      8.72      7.70      .045      .043      .045      .000   1834.00   8941.17
   .014366     1670.     1637.     1630.         9        18         0       .00   1266.50  10207.67


*SECNO 20.390

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.49

    20.390      7.79   1849.79       .00       .00   1850.43       .64      7.97       .13   1845.00
   28100.0    4936.5   20066.3    3097.2     874.8    3059.8     450.5     753.3     224.1   1844.00
       .32      5.64      6.56      6.87      .045      .043      .045      .000   1842.00   9208.06
   .006435     1100.      845.      550.         3         0         0       .00   1292.55  10500.61


*SECNO 20.530
    20.530      9.19   1854.69       .00       .00   1855.82      1.13      5.14       .24   1852.00
   28100.0    6343.9   11116.3   10639.8    1306.2     973.3    1652.8     825.4     247.2   1853.00
       .35      4.86     11.42      6.44      .045      .043      .045      .000   1845.50   9323.24
   .007499      990.      740.      540.         3         0         0       .00   1311.23  10634.47


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   28MAR96      13:39:30                                                                          PAGE   27

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


*SECNO 20.533

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    20.533     11.00   1856.00   1856.00       .00   1857.91      1.91       .04       .39   1854.00
   28100.0    4188.8   17505.8    6405.4    1830.8    1260.4    2137.9     827.0     247.7   1853.00
       .35      2.29     13.89      3.00      .045      .016      .045      .000   1845.00   9190.56
   .001235       16.       16.       16.        20        11         0       .00   1507.10  10697.66


*SECNO 20.550
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    20.550      9.13   1857.23   1857.23       .00   1859.01      1.78       .12       .04   1852.00
   28100.0    5953.0   13551.8    8595.2    2028.6     902.8    2361.0     837.9     250.8   1853.00
       .35      2.93     15.01      3.64      .045      .016      .045      .000   1848.10   9204.09
   .001526       90.       90.       90.        20        12         0       .00   1461.04  10665.14


CCHV=      .300 CEHV=      .500
*SECNO 20.730

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
```

20.730	10.18	1865.18	1865.18	.00	1866.49	1.31	3.08	.14	1862.00
28100.0	2988.1	24392.2	719.7	526.4	2531.9	195.1	925.2	279.3	1865.00
.38	5.68	9.63	3.69	.045	.042	.045	.000	1855.00	8635.25
.012650	702.	947.	1002.	20	8	0	.00	1431.93	10391.78

*SECNO 21.000

3265 DIVIDED FLOW

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

21.000	13.18	1878.68	.00	.00	1879.48	.79	12.83	.16	1876.00
28100.0	6316.7	20537.0	1246.4	964.9	2741.6	431.2	1044.6	325.8	1878.00
.43	6.55	7.49	2.89	.045	.042	.045	.000	1865.50	8702.87
.006885	1290.	1426.	1530.	6	0	0	.00	1440.15	10476.05

CCHV= .300 CEHV= .500
*SECNO 21.240

21.240	9.59	1889.09	.00	.00	1890.31	1.22	10.62	.21	1888.00
28100.0	29.4	28006.0	64.6	14.7	3158.3	32.3	1152.5	358.0	1888.00
.47	2.00	8.87	2.00	.050	.048	.050	.000	1879.50	9542.88
.010222	1370.	1267.	1250.	4	0	0	.00	746.77	10289.65

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THIS RUN EXECUTED 28MAR96 13:39:31

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

CBA # 241746-02-0300

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	18.720	900.00	1766.00	.00	.83	.00	9450.00	10220.00	.00	.00	9460.00	10190.00
	18.720	13100.00	1767.34	.00	6.14	.00	9450.00	10220.00	.00	.00	9453.29	10450.64
	18.720	18100.00	1767.93	.00	6.85	.00	9450.00	10220.00	.00	.00	9450.37	10494.40
	18.720	19100.00	1768.04	.00	6.95	.00	9450.00	10220.00	.00	.00	9449.85	10623.15
	18.720	28100.00	1768.79	.00	8.00	.00	9450.00	10220.00	.00	.00	9447.03	10683.35
*	18.950	900.00	1773.18	1773.18	6.69	1214.00	9260.00	10050.00	.00	.00	9935.28	10032.94

	18.950	13100.00	1779.26	.00	6.98	1214.00	9260.00	10050.00	.00	.00	9276.47	10048.17
	18.950	18100.00	1780.37	.00	7.00	1214.00	9260.00	10050.00	.00	.00	9252.54	10096.62
	18.950	19100.00	1780.47	.00	7.18	1214.00	9260.00	10050.00	.00	.00	9250.66	10108.40
	18.950	28100.00	1781.30	.00	8.33	1214.00	9260.00	10050.00	.00	.00	9233.91	10625.85
*	19.160	900.00	1784.92	.00	2.14	1109.00	9900.00	10580.00	.00	.00	10010.74	10568.47
	19.160	13100.00	1788.00	.00	5.49	1109.00	9900.00	10580.00	.00	.00	9599.89	10580.21
	19.160	18100.00	1788.82	.00	5.97	1109.00	9900.00	10580.00	.00	.00	9588.71	10602.58
*	19.160	19100.00	1788.95	.00	6.08	1109.00	9900.00	10580.00	.00	.00	9586.87	10606.26
*	19.160	28100.00	1789.96	.00	6.99	1109.00	9900.00	10580.00	.00	.00	9573.09	10633.82
*	19.380	900.00	1795.03	.00	5.69	1162.00	9960.00	10660.00	.00	.00	9972.44	10330.50
*	19.380	13100.00	1798.65	.00	8.02	1162.00	9960.00	10660.00	.00	.00	9963.37	10649.90
*	19.380	18100.00	1799.08	1798.99	9.40	1162.00	9960.00	10660.00	.00	.00	9962.30	10653.11
*	19.380	19100.00	1799.17	1799.10	9.61	1162.00	9960.00	10660.00	.00	.00	9962.08	10653.78
*	19.380	28100.00	1800.00	1800.00	10.95	1162.00	9960.00	10660.00	.00	.00	9689.80	10660.05
*	19.580	900.00	1807.16	.00	3.43	1056.00	9650.00	10380.00	.00	.00	9917.62	10230.49
*	19.580	13100.00	1810.98	.00	6.52	1056.00	9650.00	10380.00	.00	.00	9680.71	10346.73
*	19.580	18100.00	1811.80	.00	7.02	1056.00	9650.00	10380.00	.00	.00	9655.97	10373.54
*	19.580	19100.00	1811.94	.00	7.13	1056.00	9650.00	10380.00	.00	.00	9651.79	10378.06
*	19.580	28100.00	1812.86	.00	8.36	1056.00	9650.00	10380.00	.00	.00	9581.08	10408.00

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	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
	19.920	900.00	1819.29	.00	5.70	1795.00	8920.00	10090.00	.00	.00	9971.77	10027.34
	19.920	13100.00	1824.77	.00	4.73	1795.00	8920.00	10090.00	.00	.00	8791.07	10093.86
	19.920	18100.00	1825.20	.00	5.44	1795.00	8920.00	10090.00	.00	.00	8774.63	10096.05
	19.920	19100.00	1825.29	.00	5.55	1795.00	8920.00	10090.00	.00	.00	8771.36	10096.49
	19.920	28100.00	1826.07	.00	6.33	1795.00	8920.00	10090.00	.00	.00	8742.50	10100.33
*	20.230	900.00	1835.92	.00	5.42	1637.00	9310.00	10070.00	.00	.00	9678.16	10029.59
	20.230	13100.00	1840.20	.00	6.64	1637.00	9310.00	10070.00	.00	.00	8956.95	10176.10
	20.230	18100.00	1840.65	1840.41	7.20	1637.00	9310.00	10070.00	.00	.00	8950.13	10189.74
	20.230	19100.00	1840.72	1840.48	7.35	1637.00	9310.00	10070.00	.00	.00	8949.05	10191.89
*	20.230	28100.00	1841.26	1841.10	8.72	1637.00	9310.00	10070.00	.00	.00	8941.17	10207.67
*	20.390	900.00	1844.64	.00	3.77	845.00	9500.00	10340.00	.00	.00	9947.86	10378.03
*	20.390	13100.00	1848.42	.00	4.93	845.00	9500.00	10340.00	.00	.00	9217.21	10438.81
	20.390	18100.00	1848.90	.00	5.63	845.00	9500.00	10340.00	.00	.00	9214.02	10460.35
	20.390	19100.00	1848.98	.00	5.74	845.00	9500.00	10340.00	.00	.00	9213.40	10464.57
*	20.390	28100.00	1849.79	.00	6.56	845.00	9500.00	10340.00	.00	.00	9208.06	10500.61
	20.530	900.00	1848.39	.00	3.92	740.00	9961.00	10090.00	.00	.00	9976.54	10071.19
*	20.530	13100.00	1853.25	1853.25	9.72	740.00	9961.00	10090.00	.00	.00	9354.32	10572.39
	20.530	18100.00	1853.82	.00	10.36	740.00	9961.00	10090.00	.00	.00	9341.08	10595.48
	20.530	19100.00	1853.91	.00	10.49	740.00	9961.00	10090.00	.00	.00	9338.85	10599.26
	20.530	28100.00	1854.69	.00	11.42	740.00	9961.00	10090.00	.00	.00	9323.24	10634.47
*	20.533	900.00	1848.50	.00	3.30	16.00	9949.00	10090.00	.00	.00	9960.71	10071.26
*	20.533	13100.00	1853.94	1853.94	10.87	16.00	9949.00	10090.00	.00	.00	9337.44	10574.08
*	20.533	18100.00	1854.75	1854.75	12.08	16.00	9949.00	10090.00	.00	.00	9324.00	10608.26
*	20.533	19100.00	1854.89	1854.89	12.30	16.00	9949.00	10090.00	.00	.00	9321.73	10613.78
*	20.533	28100.00	1856.00	1856.00	13.89	16.00	9949.00	10090.00	.00	.00	9190.56	10697.66
*	20.550	900.00	1849.69	1849.69	6.95	90.00	9973.00	10079.00	.00	.00	9981.88	10069.45
*	20.550	13100.00	1855.26	1855.26	11.82	90.00	9973.00	10079.00	.00	.00	9372.92	10558.04
*	20.550	18100.00	1856.01	1856.01	13.15	90.00	9973.00	10079.00	.00	.00	9366.94	10601.36
*	20.550	19100.00	1856.32	1856.32	12.75	90.00	9973.00	10079.00	.00	.00	9364.41	10615.87
*	20.550	28100.00	1857.23	1857.23	15.01	90.00	9973.00	10079.00	.00	.00	9204.09	10665.14
*	20.730	900.00	1857.25	1857.25	7.61	947.00	9440.00	10110.00	.00	.00	9950.60	10016.57
*	20.730	13100.00	1863.47	1863.47	8.68	947.00	9440.00	10110.00	.00	.00	9285.45	10037.36
*	20.730	18100.00	1864.09	1864.09	9.30	947.00	9440.00	10110.00	.00	.00	9224.90	10380.93

*	20.730	19100.00	1864.19	1864.19	9.46	947.00	9440.00	10110.00	.00	.00	9219.79	10381.86
*	20.730	28100.00	1865.18	1865.18	9.63	947.00	9440.00	10110.00	.00	.00	8635.25	10391.78
*	21.000	900.00	1870.35	.00	4.15	1426.00	9400.00	10070.00	.00	.00	9949.49	10043.83
*	21.000	13100.00	1877.43	.00	5.29	1426.00	9400.00	10070.00	.00	.00	9161.83	10367.40
*	21.000	18100.00	1877.95	.00	6.11	1426.00	9400.00	10070.00	.00	.00	9148.06	10412.14
*	21.000	19100.00	1878.05	.00	6.22	1426.00	9400.00	10070.00	.00	.00	8718.61	10421.47
	21.000	28100.00	1878.68	.00	7.49	1426.00	9400.00	10070.00	.00	.00	8702.87	10476.05

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	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
*	21.240	900.00	1881.98	1881.95	6.76	1267.00	9570.00	10230.00	.00	.00	9980.10	10149.79
*	21.240	13100.00	1887.15	.00	6.91	1267.00	9570.00	10230.00	.00	.00	9589.08	10217.28
	21.240	18100.00	1887.89	.00	7.64	1267.00	9570.00	10230.00	.00	.00	9572.46	10228.36
	21.240	19100.00	1888.00	.00	7.81	1267.00	9570.00	10230.00	.00	.00	9569.91	10230.19
	21.240	28100.00	1889.09	.00	8.87	1267.00	9570.00	10230.00	.00	.00	9542.88	10289.65

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CBA # 241746-02-0300

SUMMARY PRINTOUT

	SECNO ALPHA	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFKWS	TOPWID	ELMIN
	18.720 1.00	.00	900.00	.00	.00	.83	.00	1780.00	1766.00	.00	730.00	1760.00
	18.720 1.05	.00	12810.41	289.59	.00	6.14	2.30	1780.00	1767.34	1.34	944.71	1760.00
	18.720 1.08	.00	17348.13	751.87	.00	6.85	2.90	1780.00	1767.93	1.93	1038.05	1760.00
	18.720 1.08	.00	18216.67	883.33	.03	6.95	2.99	1780.00	1768.04	2.04	1173.30	1760.00
	18.720 1.11	1.84	25613.34	2484.82	1.57	8.00	4.00	1780.00	1768.79	2.79	1236.32	1760.00
*	18.950 1.00	.00	900.00	.00	.00	6.69	.00	1792.00	1773.18	.00	97.66	1771.50
	18.950 1.00	.00	13100.00	.00	.00	6.98	.00	1792.00	1779.26	.00	536.94	1771.50
	18.950 1.01	1.39	18089.95	8.67	1.00	7.00	1.00	1792.00	1780.37	.00	844.07	1771.50
	18.950 1.01	2.54	19081.56	15.90	1.16	7.18	1.17	1792.00	1780.47	.00	857.74	1771.50
	18.950 1.08	39.36	27672.83	387.81	2.31	8.33	2.03	1792.00	1781.30	.00	1189.07	1771.50
*	19.160 1.00	.00	900.00	.00	.00	2.14	.00	1800.00	1784.92	.00	420.46	1782.00
	19.160 1.05	238.94	12861.06	.00	1.97	5.49	.00	1800.00	1788.00	.00	851.00	1782.00
	19.160 1.07	803.80	17285.02	11.19	2.74	5.97	1.21	1800.00	1788.82	.00	955.04	1782.00
*	19.160 1.08	934.09	18149.24	16.68	2.85	6.08	1.33	1800.00	1788.95	.00	972.14	1782.00
*	19.160 1.10	2354.39	25632.25	113.36	3.70	6.99	2.15	1800.00	1789.96	.00	1060.73	1782.00
*	19.380 1.00	.00	900.00	.00	.00	5.69	.00	1816.50	1795.03	.00	132.26	1792.00

*	19.380	.00	13100.00	.00	.00	8.02	.00	1816.50	1798.65	.00	669.19	1792.00	1.00
*	19.380	.00	18100.00	.00	.00	9.40	.00	1816.50	1799.08	.00	690.81	1792.00	1.00
*	19.380	.00	19100.00	.00	.00	9.61	.00	1816.50	1799.17	.00	691.70	1792.00	1.00
*	19.380	.00	28100.00	.00	.04	10.95	.00	1816.50	1800.00	.00	740.39	1792.00	1.00
*	19.580	.00	900.00	.00	.00	3.43	.00	1824.00	1807.16	.00	196.94	1804.50	1.00
*	19.580	.00	13100.00	.00	.00	6.52	.00	1824.00	1810.98	.00	666.02	1804.50	1.00
*	19.580	.00	18100.00	.00	.00	7.02	.00	1824.00	1811.80	.00	717.57	1804.50	1.00
*	19.580	.00	19100.00	.00	.00	7.13	.00	1824.00	1811.94	.00	726.28	1804.50	1.00
*	19.580	49.01	28031.08	19.91	1.65	8.36	1.65	1824.00	1812.86	.00	826.91	1804.50	1.02
	19.920	.00	900.00	.00	.00	5.70	.00	1840.00	1819.29	.00	55.57	1815.50	1.00
	19.920	1526.59	11571.25	2.15	5.30	4.73	1.45	1840.00	1824.77	.00	1302.78	1815.50	1.00
	19.920	2007.54	16085.22	7.24	5.76	5.44	1.98	1840.00	1825.20	.00	1321.42	1815.50	1.00
	19.920	2103.90	16987.40	8.70	5.82	5.55	2.07	1840.00	1825.29	.00	1325.13	1815.50	1.00
	19.920	2996.33	25074.74	28.94	6.16	6.33	2.71	1840.00	1826.07	.00	1357.83	1815.50	1.00
*	20.230	.00	900.00	.00	.00	5.42	.00	1851.50	1835.92	.00	120.20	1834.00	1.00
	20.230	1827.72	10204.50	1067.78	4.34	6.64	5.90	1851.50	1840.20	.00	1177.65	1834.00	1.06
	20.230	3076.28	13505.37	1518.35	5.27	7.20	6.54	1851.50	1840.65	.00	1239.61	1834.00	1.04
	20.230	3308.12	14189.10	1602.78	5.43	7.35	6.65	1851.50	1840.72	.00	1242.84	1834.00	1.04
*	20.230	5407.59	20311.92	2380.50	6.75	8.72	7.70	1851.50	1841.26	.00	1266.50	1834.00	1.03
*	20.390	.00	793.44	106.56	.00	3.77	2.89	1860.00	1844.64	.00	179.09	1842.00	1.02
*	20.390	1947.45	9393.17	1759.37	4.06	4.93	6.46	1860.00	1848.42	.00	1221.59	1842.00	1.05
	20.390	2911.79	12989.43	2198.77	4.73	5.63	6.77	1860.00	1848.90	.00	1246.33	1842.00	1.03
	20.390	3110.17	13704.03	2285.80	4.84	5.74	6.80	1860.00	1848.98	.00	1251.17	1842.00	1.02
*	20.390	4936.49	20066.29	3097.22	5.64	6.56	6.87	1860.00	1849.79	.00	1292.55	1842.00	1.01

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	SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFKWS	TOPWID	ELMIN	ALPHA
	20.530	.00	900.00	.00	.00	3.92	.00	1856.00	1848.39	.00	94.65	1845.50	1.00
*	20.530	1216.45	7650.86	4232.68	2.98	9.72	4.62	1856.00	1853.25	.00	1218.07	1845.50	1.63
	20.530	2755.14	8929.71	6415.16	3.62	10.36	5.35	1856.00	1853.82	.00	1254.39	1845.50	1.58
	20.530	3087.25	9171.69	6841.06	3.76	10.49	5.48	1856.00	1853.91	.00	1260.40	1845.50	1.57

	20.530	6343.94	11116.26	10639.80	4.86	11.42	6.44	1856.00	1854.69	.00	1311.23	1845.50	1.42
*	20.533	.00	900.00	.00	.00	3.30	.00	1857.00	1848.50	.00	110.55	1845.00	1.00
*	20.533	520.13	10550.42	2029.45	1.07	10.87	1.96	1857.00	1853.94	.00	1151.20	1845.00	3.47
*	20.533	1551.65	13107.59	3440.76	1.58	12.08	2.39	1857.00	1854.75	.00	1284.26	1845.00	4.02
*	20.533	1787.69	13583.68	3728.63	1.67	12.30	2.46	1857.00	1854.89	.00	1292.04	1845.00	4.07
*	20.533	4188.84	17505.75	6405.40	2.29	13.89	3.00	1857.00	1856.00	.00	1507.10	1845.00	4.26
*	20.550	.00	900.00	.00	.00	6.95	.00	1857.50	1849.69	.00	87.57	1848.10	1.00
*	20.550	1492.99	8201.89	3405.12	1.87	11.82	2.60	1857.50	1855.26	.00	1185.12	1848.10	4.10
*	20.550	2833.59	10165.75	5100.66	2.27	13.15	3.03	1857.50	1856.01	.00	1234.42	1848.10	4.22
*	20.550	3295.85	10281.82	5522.33	2.29	12.75	2.98	1857.50	1856.32	.00	1251.46	1848.10	4.19
*	20.550	5953.00	13551.80	8595.20	2.93	15.01	3.64	1857.50	1857.23	.00	1461.04	1848.10	4.06
*	20.730	.00	900.00	.00	.00	7.61	.00	1876.00	1857.25	.00	65.96	1855.00	1.00
*	20.730	414.71	12685.29	.00	3.65	8.68	.00	1876.00	1863.47	.00	751.91	1855.00	1.06
*	20.730	1013.31	17053.88	32.81	4.41	9.30	1.68	1876.00	1864.09	.00	928.07	1855.00	1.09
*	20.730	1165.76	17876.24	57.99	4.66	9.46	1.95	1876.00	1864.19	.00	946.21	1855.00	1.10
*	20.730	2988.09	24392.20	719.72	5.68	9.63	3.69	1876.00	1865.18	.00	1431.93	1855.00	1.13
*	21.000	.00	900.00	.00	.00	4.15	.00	1884.00	1870.35	.00	94.34	1865.50	1.00
*	21.000	3008.48	10062.94	28.58	4.90	5.29	.89	1884.00	1877.43	.00	1054.92	1865.50	1.02
*	21.000	4136.29	13722.50	241.21	5.59	6.11	1.55	1884.00	1877.95	.00	1250.23	1865.50	1.07
*	21.000	4353.89	14418.02	328.09	5.67	6.22	1.70	1884.00	1878.05	.00	1283.76	1865.50	1.08
	21.000	6316.68	20536.95	1246.37	6.55	7.49	2.89	1884.00	1878.68	.00	1440.15	1865.50	1.11
*	21.240	.00	900.00	.00	.00	6.76	.00	1900.00	1881.98	.00	89.49	1879.50	1.00
*	21.240	.00	13100.00	.00	.00	6.91	.00	1900.00	1887.15	.00	628.19	1879.50	1.00
	21.240	.00	18100.00	.00	.00	7.64	.00	1900.00	1887.89	.00	655.89	1879.50	1.00
	21.240	.00	19100.00	.00	.00	7.81	.00	1900.00	1888.00	.00	660.27	1879.50	1.00
	21.240	29.37	28006.00	64.63	2.00	8.87	2.00	1900.00	1889.09	.00	746.77	1879.50	1.02

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CBA # 241746-02-0300

SUMMARY PRINTOUT

SECNO	XLCH	K*CHSL	EG	HV	HL	OLOSS	10*KS	VOL	DEPTH	K*XNL	K*XNCH

K*XNR

	18.720	.00	.00	1766.01	.01	.00	.00	4.17	.00	6.00	.00	48.00
	.00											
	18.720	.00	.00	1767.92	.57	.00	.00	101.74	.00	7.34	.00	48.00
	50.00											
	18.720	.00	.00	1768.63	.70	.00	.00	100.02	.00	7.93	.00	48.00
	50.00											
	18.720	.00	.00	1768.76	.72	.00	.00	98.70	.00	8.04	.00	48.00
	50.00											
	18.720	.00	.00	1769.72	.93	.00	.00	100.26	.00	8.79	50.00	48.00
	50.00											
*	18.950	1214.00	9.47	1773.87	.69	1.62	.34	305.26	17.06	1.68	.00	48.00
	.00											
	18.950	1214.00	9.47	1780.01	.76	12.01	.09	96.23	56.99	7.76	.00	48.00
	.00											
	18.950	1214.00	9.47	1781.13	.76	12.48	.03	105.67	75.02	8.87	50.00	48.00
	50.00											
	18.950	1214.00	9.47	1781.26	.80	12.46	.04	106.96	77.86	8.97	50.00	48.00
	50.00											
	18.950	1214.00	9.47	1782.37	1.06	12.58	.07	107.27	102.30	9.80	50.00	48.00
	50.00											
*	19.160	1109.00	9.47	1785.00	.07	10.94	.19	48.12	24.13	2.92	.00	48.00
	.00											
	19.160	1109.00	9.47	1788.46	.46	8.36	.09	60.65	112.25	6.00	50.00	48.00
	.00											
	19.160	1109.00	9.47	1789.35	.53	8.15	.07	54.05	148.72	6.82	50.00	48.00
	50.00											
*	19.160	1109.00	9.47	1789.50	.55	8.16	.07	53.76	154.21	6.95	50.00	48.00
	50.00											
*	19.160	1109.00	9.47	1790.67	.71	8.19	.11	54.05	202.42	7.96	50.00	48.00
	50.00											
*	19.380	1162.00	8.61	1795.53	.50	10.32	.22	215.58	31.84	3.03	.00	43.00
	.00											
*	19.380	1162.00	8.61	1799.65	1.00	10.91	.27	164.42	166.94	6.65	.00	43.00
	.00											
*	19.380	1162.00	8.61	1800.45	1.37	10.68	.42	189.45	217.13	7.08	.00	43.00
	.00											
*	19.380	1162.00	8.61	1800.60	1.43	10.66	.44	190.28	225.17	7.17	.00	43.00
	.00											
*	19.380	1162.00	8.61	1801.86	1.86	10.46	.58	178.66	294.88	8.00	45.00	43.00
	.00											
*	19.580	1056.00	11.84	1807.34	.18	11.72	.10	67.49	36.94	2.66	.00	43.00
	.00											
*	19.580	1056.00	11.84	1811.64	.66	11.89	.10	81.94	211.08	6.48	.00	43.00
	.00											
*	19.580	1056.00	11.84	1812.57	.77	11.94	.18	75.06	271.73	7.30	.00	43.00
	.00											
*	19.580	1056.00	11.84	1812.73	.79	11.93	.19	74.76	281.73	7.44	.00	43.00
	.00											
*	19.580	1056.00	11.84	1813.94	1.08	11.84	.23	76.87	367.13	8.36	45.00	43.00
	45.00											
	19.920	1795.00	6.13	1819.80	.51	12.29	.16	69.47	45.60	3.79	.00	43.00
	.00											
	19.920	1795.00	6.13	1825.13	.36	13.40	.09	70.31	307.29	9.27	45.00	43.00
	45.00											
	19.920	1795.00	6.13	1825.67	.46	13.01	.09	72.02	391.23	9.70	45.00	43.00
	45.00											
	19.920	1795.00	6.13	1825.78	.48	12.96	.09	71.74	405.61	9.79	45.00	43.00
	45.00											
	19.920	1795.00	6.13	1826.69	.62	12.61	.14	66.19	526.17	10.57	45.00	43.00
	45.00											

*	20.230	1637.00	11.30	1836.38	.46	16.57	.01	160.87	51.68	1.92	.00	43.00
	.00											
	20.230	1637.00	11.30	1840.82	.62	15.56	.13	134.86	399.13	6.20	45.00	43.00
	45.00											
	20.230	1637.00	11.30	1841.38	.73	15.58	.13	130.86	504.34	6.65	45.00	43.00
	45.00											
	20.230	1637.00	11.30	1841.49	.76	15.57	.14	131.28	522.59	6.72	45.00	43.00
	45.00											
*	20.230	1637.00	11.30	1842.33	1.07	15.42	.22	143.66	675.05	7.26	45.00	43.00
	45.00											
*	20.390	845.00	9.47	1844.85	.21	8.40	.07	69.86	55.57	2.64	.00	43.00
	45.00											
*	20.390	845.00	9.47	1848.81	.40	7.92	.07	68.29	446.76	6.42	45.00	43.00
	45.00											
	20.390	845.00	9.47	1849.39	.50	7.94	.07	69.00	563.58	6.90	45.00	43.00
	45.00											
	20.390	845.00	9.47	1849.49	.51	7.93	.07	68.67	583.91	6.98	45.00	43.00
	45.00											
*	20.390	845.00	9.47	1850.43	.64	7.97	.13	64.35	753.27	7.79	45.00	43.00
	45.00											

1

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	SECNO	XLCH	K*CHSL	EG	HV	HL	OLOSS	10*KS	VOL	DEPTH	K*XNL	K*XNCH
	K*XNR											
	20.530	740.00	4.73	1848.63	.24	3.77	.01	39.83	59.54	2.89	.00	43.00
	.00											
*	20.530	740.00	4.73	1854.22	.98	5.08	.29	72.01	487.10	7.75	45.00	43.00
	45.00											
	20.530	740.00	4.73	1854.83	1.01	5.18	.26	72.64	615.61	8.32	45.00	43.00
	45.00											
	20.530	740.00	4.73	1854.94	1.02	5.19	.26	73.04	638.09	8.41	45.00	43.00
	45.00											
	20.530	740.00	4.73	1855.82	1.13	5.14	.24	74.99	825.35	9.19	45.00	43.00
	45.00											
*	20.533	16.00	-31.25	1848.67	.17	.01	.02	3.81	59.63	3.50	.00	16.00
	.00											
*	20.533	16.00	-31.25	1855.43	1.49	.04	.26	10.71	487.95	8.94	45.00	16.00
	45.00											
*	20.533	16.00	-31.25	1856.41	1.66	.04	.33	11.42	616.78	9.75	45.00	16.00
	45.00											
*	20.533	16.00	-31.25	1856.58	1.69	.04	.33	11.54	639.31	9.89	45.00	16.00
	45.00											
*	20.533	16.00	-31.25	1857.91	1.91	.04	.39	12.35	827.03	11.00	45.00	16.00
	45.00											
*	20.550	90.00	34.44	1850.44	.75	.08	.29	33.43	60.04	1.59	.00	16.00
	.00											
*	20.550	90.00	34.44	1856.65	1.39	.11	.03	13.46	493.42	7.16	45.00	16.00
	45.00											
*	20.550	90.00	34.44	1857.57	1.56	.12	.03	14.41	624.23	7.91	45.00	16.00
	45.00											
*	20.550	90.00	34.44	1857.74	1.41	.11	.08	12.80	647.35	8.22	45.00	16.00
	45.00											
*	20.550	90.00	34.44	1859.01	1.78	.12	.04	15.26	837.90	9.13	45.00	16.00
	45.00											
*	20.730	947.00	7.29	1858.15	.90	6.51	.07	215.00	62.74	2.25	.00	42.00
	.00											
*	20.730	947.00	7.29	1864.61	1.14	3.12	.08	183.47	539.26	8.47	45.00	42.00
	.00											
*	20.730	947.00	7.29	1865.38	1.28	3.16	.08	158.88	684.08	9.09	45.00	42.00
	45.00											

```
*    20.730    947.00      7.29   1865.51      1.32      2.88       .03    159.97    711.93      9.19     45.00     42.00
   45.00
*    20.730    947.00      7.29   1866.49      1.31      3.08       .14    126.50    925.23     10.18     45.00     42.00
   45.00

*    21.000   1426.00      7.36   1870.61       .27     12.27       .19     46.03     68.22      4.85       .00     42.00
     .00
*    21.000   1426.00      7.36   1877.85       .42     13.02       .22     55.56    605.65     11.93     45.00     42.00
   45.00
*    21.000   1426.00      7.36   1878.50       .55     12.90       .22     59.58    768.32     12.45     45.00     42.00
   45.00
*    21.000   1426.00      7.36   1878.62       .57     12.89       .23     59.23    799.81     12.55     45.00     42.00
   45.00
     21.000   1426.00      7.36   1879.48       .79     12.83       .16     68.85   1044.62     13.18     45.00     42.00
   45.00

*    21.240   1267.00     11.05   1882.69       .71     11.85       .22    283.54     73.32      2.48       .00     48.00
     .00
*    21.240   1267.00     11.05   1887.89       .74      9.88       .16    114.72    671.01      7.65       .00     48.00
     .00
     21.240   1267.00     11.05   1888.80       .91     10.12       .18    110.21    849.35      8.39       .00     48.00
     .00
     21.240   1267.00     11.05   1888.95       .95     10.14       .19    111.65    883.94      8.50       .00     48.00
     .00
     21.240   1267.00     11.05   1890.31      1.22     10.62       .21    102.22   1152.48      9.59     50.00     48.00
   50.00

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 SUMMARY OF ERRORS AND SPECIAL NOTES


CAUTION SECNO=     18.950  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     18.950  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     18.950  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     19.160  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.160  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.160  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     19.380  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.380  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.380  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.380  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     19.380  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     19.380  PROFILE=  5  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     19.580  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.580  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.580  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.580  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.580  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     20.230  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     20.230  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     20.390  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     20.390  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     20.390  PROFILE=  5  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     20.530  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.530  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     20.533  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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CAUTION SECNO=     20.533  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.533  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.533  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.533  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.533  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.533  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.533  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.533  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.533  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.533  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.533  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.533  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     20.550  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.550  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.550  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.550  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
1
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CAUTION SECNO=     20.550  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.550  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.550  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.550  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.550  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.550  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     20.730  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.730  PROFILE=  3  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  3  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  3  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.730  PROFILE=  4  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  4  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  4  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.730  PROFILE=  5  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  5  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  5  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     21.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     21.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     21.000  PROFILE=  3  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     21.000  PROFILE=  4  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     21.240  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     21.240  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

Proposed Conditions Model

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
     *
 *                                        *
     *
 *  Version   4.6.2;  May 1991            *
       *
 *                                        *
     *
 *  RUN DATE    28MAR96    TIME   16:58:13  *
          *
*****************************************
```

```
****************************************
 *  U.S. ARMY CORPS OF ENGINEERS
 *  HYDROLOGIC ENGINEERING CENTER
 *  609 SECOND STREET, SUITE D
 *  DAVIS, CALIFORNIA 95616-4687
 *          (916) 756-1104
****************************************
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```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

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THIS RUN EXECUTED 28MAR96 16:58:13

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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```
T1  SKUNK CREEK WASH AT DESERT HILLS DRIVE - FOUR 10'X 4' BOX CULVERTS
T2  File: DESPRO_B
T3  CBA # 241746-02-0300          2/27/96
  Box raised 0.3'

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0        2                          0                         0    1764.6

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1                 -1

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38       43        1        2       26       39       21       22       27       28
     53       54        0       38       13       14       15       55       26       56
     63        1       52        4       42       57                38       39       33
      3       10       11       12        5        7        8       16       17       18

NC    .050     .050     .048     .300     .500
QT       2     1800    28100

X1   18.72       16     9450    10220        0        0        0
GR    1780     9350     1776     9420     1768     9450     1766     9460     1764     9960
```

GR	1760	9980	1760	10000	1764	10020	1764	10160	1768	10220
GR	1766	10350	1768	10500	1768	10620	1772	10940	1776	11430
GR	1780	11760								

X1	18.95	26	9260	10050	1200	1200	1214			
GR	1796	8870	1792	9090	1788	9130	1784	9180	1780	9260
GR	1776	9350	1774	9370	1776	9400	1778	9420	1776	9460
GR	1774	9480	1776	9510	1780	9650	1780	9850	1776	9900
GR	1772	9950	1771.5	9970	1771.5	10000	1771.5	10010	1772	10030
GR	1780	10050	1782	10300	1780.5	10550	1784	10880	1788	11310
GR	1792	11680								

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X1	19.16	41	9900	10580	1100	1040	1109			
GR	1805.5	9220	1808	9330	1804	9410	1800	9450	1796	9490
GR	1788	9600	1787	9650	1787	9720	1788	9770	1789.5	9840
GR	1788	9900	1785	9930	1785	9970	1786	9980	1786	10000
GR	1784	10020	1784	10030	1784.5	10060	1784	10160	1782	10170
GR	1784	10190	1786	10260	1784	10330	1783	10340	1784	10360
GR	1785	10380	1784	10400	1786	10460	1784	10510	1782	10520
GR	1782	10560	1784	10565	1788	10580	1792	10690	1793	10820
GR	1792.5	10960	1793	11060	1792	11130	1792	11180	1796	11580
GR	1800	11700								

NC	.045	.045	.043	.300	.500

X1	19.38	27	9960	10660	1180	1150	1162			
GR	1820	8750	1816	8870	1812	8930	1808	8970	1804	9050
GR	1800	9690	1800	9730	1802	9890	1800	9960	1792	9980
GR	1792	10000	1792	10010	1796	10020	1798	10050	1798	10150
GR	1796	10180	1794	10310	1796	10350	1799	10410	1796	10500
GR	1796	10630	1800	10660	1804	10840	1808	11030	1842	11240
GR	1816	11470	1816.5	11660						

X1	19.58	23	9650	10380	1110	1100	1056			
GR	1832	8320	1828	8670	1820	8810	1816	8940	1815	9070
GR	1813	9140	1813.5	9530	1812	9650	1809	9740	1810	9800
GR	1808	9880	1806	9970	1804.5	9980	1804.5	10000	1804.5	10020
GR	1808	10040	1808	10140	1805	10180	1808	10250	1812	10380
GR	1816	10510	1820	10680	1824	11080				

X1	19.92	34	8920	10090	1330	1840	1795			
GR	1840	8430	1836	8590	1828	8670	1824	8820	1820	8850
GR	1824	8920	1824	9000	1822	9020	1824	9030	1824	9200
GR	1822	9220	1822	9250	1824	9280	1823	9380	1823	9550
GR	1820	9600	1820	9620	1824	9630	1824	9660	1824	9690
GR	1822	9730	1823	9800	1823	9890	1822	9940	1820	9970
GR	1816	9980	1815.5	10000	1816	10015	1820	10030	1824	10090
GR	1828	10110	1832	10200	1836	10500	1840	10640		

X1	20.23	35	9310	10070	1670	1630	1637			
GR	1851.5	8120	1852	8240	1854	8430	1854	8610	1852	8770
GR	1848	8870	1844	8900	1840	8960	1838	9000	1840	9310
GR	1840	9430	1837	9460	1838	9470	1839.5	9560	1840	9600
GR	1840.5	9640	1840	9670	1835	9680	1835	9710	1836	9720
GR	1840	9820	1836	9950	1834	9960	1834	10000	1834	10020
GR	1836	10030	1840	10050	1838	10070	1838	10130	1840	10170
GR	1844	10290	1848	10530	1852	10870	1856	11090	1860	11300

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X1	20.39	23	9500	10340	1100	550	845			
GR	1864	8950	1860	9140	1848	9220	1846.5	9300	1847	9430
GR	1845	9500	1847	9660	1847	9940	1844	9950	1842	9970
GR	1842	10000	1842	10020	1844	10030	1848	10110	1848	10210
GR	1844	10310	1844	10340	1843	10360	1844	10370	1848	10420
GR	1852	10600	1856	10830	1860	11100				
X1	20.53	30	9961	10090	990	540	740			
GR	1856	9160	1855	9317	1854	9337	1853	9360	1852	9382
GR	1852	9397	1853	9414	1853	9772	1851	9849	1851	9858
GR	1852	9912	1852	9948	1852	9961	1844.8	9989	1844.8	10000
GR	1844.8	10025	1845.5	10035	1845.5	10053	1849	10075	1853	10090
GR	1853	10101	1852	10114	1851	10293	1850.2	10409	1851	10473
GR	1851.5	10497	1853.4	10579	1854.4	10618	1855.8	10698	1856.8	10773
NC	0.03	0.03	0.016	.3	.5					
X1	20.533	31	9949	10101	25	25	25			
X3	10									
GR	1857	9115	1856	9190	1855	9320	1854	9336	1853	9360
GR	1852	9380	1852	9385	1853	9410	1853	9780	1853	9812
GR	1854	9867	1854	9949	1846	9966	1845.1	9988	1845.1	10000
GR	1845.1	10012	1845.1	10025	1846	10035	1846	10053	1849	10075
GR	1853	10090	1853	10101	1852	10114	1851	10273	1851	10360
GR	1851	10420	1853	10497	1854	10579	1855	10618	1856	10698
GR	1857	10773								
X1	20.54	49	9840	10140	5	5	5			
X3	10									
BT	-49	9115	1857	1857	9190	1856	1856	9350	1855.5	1855.5
BT		9390	1853	1853	9520	1853.9	1853.9	9560	1853.8	1853.8
BT		9740	1853.4	1853.4	9802	1852.3	1852.3	9840	1851.8	1851.8
BT		9895	1849.98	1849.2	9955	1849.98	1846.8	9978.2	1849.98	1845.1
BT		9978.21	1849.98	1849.1	9979.1	1849.98	1849.1	9979.12	1849.98	1845.1
BT		9979.13	1849.98	1849.1	9990.1	1849.98	1849.1	9990.12	1849.98	1845.1
BT		9990.13	1849.98	1849.1	9991.02	1849.98	1849.1	9991.03	1849.98	1845.1
BT		9991.04	1849.98	1849.1	10001.04	1849.98	1849.1	10001.05	1849.98	1845.1
BT		10001.06	1849.98	1849.1	10001.98	1849.98	1849.1	10001.99	1849.98	1845.1
BT		10002	1849.98	1849.1	10012	1849.98	1849.1	10012.1	1849.98	1845.1
BT		10012.12	1849.98	1845.1	10012.13	1849.98	1849.1	10013.13	1849.98	1849.1
BT		10013.14	1849.98	1845.1	10013.15	1849.98	1849.1	10023.15	1849.98	1849.1
BT		10024.15	1849.98	1849.1	10024.16	1849.98	1845.1	10024.17	1849.98	1849.1
BT		10025.17	1849.98	1849.1	10025.18	1849.98	1845.1	10060	1849.98	1846.9
BT		10140	1849.98	1849.8	10240	1851	1851	10340	1850.4	1850.4
BT		10423	1852.2	1852.2	10440	1852.4	1852.4	10540	1855.8	1855.8
BT		10740	1858	1858						
GR	1857	9115	1856	9190	1855.5	9350	1853	9390	1853.9	9520
GR	1853.8	9560	1853.4	9740	1852.3	9802	1851.8	9840	1849.2	9895
GR	1846.8	9955	1845.1	9978.2	1845.1	9978.21	1845.1	9979.1	1845.1	9979.12
GR	1845.1	9979.13	1845.1	9990.1	1845.1	9990.12	1845.1	9990.13	1845.1	9991.02

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GR	1845.1	9991.03	1845.1	9991.04	1845.1	10001.04	1845.1	10001.05	1845.1	10001.06
GR	1845.1	10001.98	1845.1	10001.99	1845.1	10002	1845.1	10012	1845.1	10012.1
GR	1845.1	10012.12	1845.1	10012.13	1845.1	10013.13	1845.1	10013.14	1845.1	10013.15
GR	1845.1	10023.15	1845.1	10024.15	1845.1	10024.16	1845.1	10024.17	1845.1	10025.17
GR	1845.1	10025.18	1846.9	10060	1849.8	10140	1851	10240	1850.4	10340
GR	1852.2	10423	1852.4	10440	1855.8	10540	1858	10740		

X1	20.544	49	9840	10140	50	50	50			
X3	10									
BT	-49	9115	1857.8	1857.8	9190	1856.8	1856.8	9350	1856.3	1856.3
BT		9390	1853.8	1853.8	9520	1854.7	1854.7	9560	1854.6	1854.6
BT		9740	1854.2	1854.2	9802	1853.1	1853.1	9840	1852.6	1852.6
BT		9900	1850.98	1850	9935	1850.98	1848.5	9960	1850.98	1847.6
BT		9983.2	1850.98	1846.1	9983.21	1850.98	1850.1	9984.13	1850.98	1850.1
BT		9984.131	1850.98	1846.1	9984.132	1850.98	1850.1	9994.14	1850.98	1850.1
BT		9994.145	1850.98	1846.1	9994.146	1850.98	1850.1	9995.06	1850.98	1850.1
BT		9995.061	1850.98	1846.1	9995.062	1850.98	1850.1	10005.06	1850.98	1850.1
BT		10005.07	1850.98	1846.1	10005.08	1850.98	1850.1	10006.08	1850.98	1850.1
BT		10006.09	1850.98	1846.1	10006.1	1850.98	1850.1	10016	1850.98	1850.1
BT		10016.1	1850.98	1846.1	10016.12	1850.98	1850.1	10017.12	1850.98	1850.1
BT		10017.13	1850.98	1846.1	10017.14	1850.98	1850.1	10027.14	1850.98	1850.1
BT		10027.15	1850.98	1846.1	10027.16	1850.98	1850.1	10028.16	1850.98	1850.1
BT		10028.17	1850.98	1846.1	10028.18	1850.98	1850.1	10028.19	1850.98	1846.1
BT		10140	1850.98	1850.6	10240	1851.9	1851.9	10340	1851.2	1851.2
BT		10423	1853	1853	10440	1853.2	1853.2	10540	1856.6	1856.6
BT		10740	1858.8	1858.8						
GR	1857.8	9115	1856.8	9190	1856.3	9350	1853.8	9390	1854.7	9520
GR	1854.6	9560	1854.2	9740	1853.1	9802	1852.6	9840	1850	9900
GR	1848.5	9935	1847.6	9960	1846.1	9983.2	1846.1	9983.21	1846.1	9984.13
GR	1846.1	9984.131	1846.1	9984.132	1846.1	9994.14	1846.1	9994.145	1846.1	9994.146
GR	1846.1	9995.06	1846.1	9995.061	1846.1	9995.062	1846.1	10005.06	1846.1	10005.07
GR	1846.1	10005.08	1846.1	10006.08	1846.1	10006.09	1846.1	10006.1	1846.1	10016
GR	1846.1	10016.1	1846.1	10016.12	1846.1	10017.12	1846.1	10017.13	1846.1	10017.14
GR	1846.1	10027.14	1846.1	10027.15	1846.1	10027.16	1846.1	10028.16	1846.1	10028.17
GR	1846.1	10028.18	1846.1	10028.19	1850.6	10140	1851.9	10240	1851.2	10340
GR	1853	10423	1853.2	10440	1856.6	10540	1858.8	10740		

X1	20.55	33	9965	10079	5	5	5			
X3	10									
GR	1857.5	9172	1857	9232	1857	9359	1854	9383	1853	9432
GR	1854.5	9465	1855	9740	1852.3	9802	1855	9880	1853	9892
GR	1852	9910	1851	9926	1851	9930	1852	9943	1852	9965
GR	1852	9973	1846.1	9988	1846.1	10000	1846.1	10012	1848.15	10065
GR	1853	10079	1853	10140	1854	10165	1853	10175	1852	10235
GR	1851	10280	1851	10375	1852.3	10425	1855	10543	1856	10601
GR	1857	10647	1858	10725	1858	10740				

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NC	0.045	0.045	0.043							
X1	20.555	28	9965	10079	35	35	35			
GR	1857.5	9172	1857	9232	1857	9359	1854	9383	1854	9432
GR	1854.5	9465	1855	9740	1855	9880	1853	9892	1852	9910
GR	1851	9926	1851	9930	1852	9943	1852.2	9965	1846.1	9973
GR	1846.1	10000	1846.1	10065	1853.2	10079	1854	10140	1854	10165
GR	1853	10175	1852	10235	1851	10280	1851	10375	1855	10543
GR	1856	10601	1857	10647	1858	10725				

NC	.045	.045	.043	.300	.500					
X1	20.73	31	9440	10110	702	1002	947			
GR	1876	8350	1872	8450	1868	8560	1865	8640	1865	8710
GR	1865	8780	1866	8970	1865	9060	1866	9120	1864	9230
GR	1862	9440	1861	9480	1862	9540	1863	9720	1860	9930
GR	1856	9960	1855	9970	1855	10000	1856	10015	1860	10020
GR	1864	10040	1865	10110	1865	10220	1864	10280	1863.5	10300
GR	1864	10320	1864	10380	1868	10420	1872	10490	1876	10570

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GR      1880      10720

X1        21         23       9400      10070       1290       1530       1426
GR      1884       8300       1880       8670       1878       8720       1879       8830       1879       9120
GR      1876       9200       1873       9240       1876       9400       1876       9800       1875       9920
GR      1872       9940     1868.5       9960     1868.5      10000     1865.5      10030       1876      10060
GR      1878      10070       1877      10330       1880      10590       1884      10840       1888      10950
GR      1892      11040       1896      11300       1900      11520

NC      .050       .050       .048       .300       .500

X1     21.24         29       9570      10230       1370       1250       1267
GR      1900       8930       1896       9110       1892       9470       1888       9570       1884       9660
GR      1882       9680       1884       9700       1883       9730       1884       9740     1885.5       9800
GR      1884       9850       1886       9880       1886       9930       1884       9950       1884       9970
GR      1880       9990     1879.5      10000       1880      10010       1884      10030       1887      10060
GR      1884      10090       1880      10110       1880      10130       1884      10170       1888      10230
GR      1892      10450       1892      10710       1896      10930       1900      11100
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SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 1
0

CCHV=     .300 CEHV=     .500
*SECNO 18.720
   18.720      4.60   1764.60   1764.56   1764.60   1765.07       .47       .00       .00   1768.00
   1800.0        .0    1800.0        .0        .0     327.7        .0        .0        .0   1768.00
      .00       .00      5.49       .00      .000      .048      .000      .000   1760.00   9810.01
  .035662        0.        0.        0.         0         4         0       .00    358.99  10169.00

*SECNO 18.950

3265 DIVIDED FLOW

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.00

   18.950      4.32   1775.82       .00       .00   1776.00       .18     10.85       .09   1780.00
   1800.0        .0    1800.0        .0        .0     529.0        .0      11.9       8.2   1780.00
      .10       .00      3.40       .00      .000      .048      .000      .000   1771.50   9351.75
  .003975     1200.     1214.     1200.         7         0         0       .00    228.62  10039.56

*SECNO 19.160

3265 DIVIDED FLOW

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .39

   19.160      2.82   1784.82       .00       .00   1785.18       .35      9.09       .09   1788.00
   1800.0        .0    1800.0        .0        .0     378.4        .0      23.5      16.2   1788.00
      .16       .00      4.76       .00      .000      .048      .000      .000   1782.00  10011.76
  .025716     1100.     1109.     1040.         8         0         0       .00    402.35  10568.09
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CCHV=      .300 CEHV=      .500
*SECNO 19.380

3265 DIVIDED FLOW

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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.22

    19.380      4.64   1796.64       .00       .00   1796.80       .15     11.56       .06   1800.00
    1800.0        .0    1800.0        .0        .0     574.5        .0      36.2      27.0   1800.00
       .27       .00      3.13       .00      .000      .043      .000      .000   1792.00   9968.39
   .005240     1180.     1162.     1150.         7         0         0       .00    408.06  10634.84


*SECNO 19.580

3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    19.580      2.72   1807.22   1807.22       .00   1807.89       .68     10.33       .26   1812.00
    1800.0        .0    1800.0        .0        .0     273.0        .0      46.5      34.4   1812.00
       .31       .00      6.59       .00      .000      .043      .000      .000   1804.50   9915.21
   .024385     1110.     1056.     1100.         5        11         0       .00    201.63  10231.74


*SECNO 19.920

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.52

    19.920      6.37   1821.87       .00       .00   1822.10       .23     14.08       .13   1824.00
    1800.0      85.3    1714.7        .0      43.6     434.1        .0      61.7      42.8   1824.00
       .44      1.95      3.95       .00      .045      .043      .000      .000   1815.50   8835.99
   .003853     1330.     1795.     1840.         6         0         0       .00    218.59  10058.03


*SECNO 20.230

3265 DIVIDED FLOW

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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST
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3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.230	2.53	1836.53	1836.53	.00	1837.34	.81	12.80	.29	1840.00
1800.0	.0	1800.0	.0	.0	249.0	.0	75.4	49.9	1838.00
.50	.00	7.23	.00	.000	.043	.000	.000	1834.00	9676.95
.023601	1670.	1637.	1630.	5	18	0	.00	155.90	10032.63

*SECNO 20.390

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.04

20.390	3.71	1845.71	.00	.00	1845.92	.21	8.40	.18	1845.00
1800.0	10.6	1471.1	318.3	8.6	406.6	84.1	82.4	54.4	1844.00
.57	1.24	3.62	3.78	.045	.043	.045	.000	1842.00	9475.48
.005696	1100.	845.	550.	5	0	0	.00	324.04	10391.26

*SECNO 20.530

20.530	4.44	1849.24	.00	.00	1849.65	.41	3.63	.10	1852.00
1800.0	.0	1800.0	.0	.0	349.7	.0	89.4	58.0	1853.00
.60	.00	5.15	.00	.000	.043	.000	.000	1844.80	9971.76
.004462	990.	740.	540.	5	0	0	.00	104.12	10075.88

CCHV= .300 CEHV= .500
*SECNO 20.533

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.03

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1854.00 ELREA= 1853.00

20.533	4.28	1849.38	.00	.00	1849.70	.32	.03	.03	1854.00
1800.0	.0	1800.0	.0	.0	394.7	.0	89.6	58.1	1853.00
.61	.00	4.56	.00	.000	.016	.000	.000	1845.10	9958.83
.000485	25.	25.	25.	1	0	0	.00	117.57	10076.40

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 20.540

3301 HV CHANGED MORE THAN HVINS

3370 NORMAL BRIDGE, NRD= 49 MIN ELTRD= 1849.98 MAX ELLC= 1851.80

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1851.80 ELREA= 1849.80

20.540	3.56	1848.66	1848.66	.00	1850.46	1.80	.01	.74	1851.80
1800.0	.0	1800.0	.0	.0	167.1	.0	89.7	58.1	1849.80
.61	.00	10.77	.00	.000	.016	.000	.000	1845.10	9908.42
.003255	5.	5.	5.	4	12	0	-242.25	200.22	10108.64

*SECNO 20.544

3370 NORMAL BRIDGE, NRD= 49 MIN ELTRD= 1850.98 MAX ELLC= 1852.60

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1852.60 ELREA= 1850.60

20.544	3.81	1849.91	1849.91	.00	1851.63	1.72	.15	.03	1852.60
1800.0	.0	1800.0	.0	.0	171.2	.0	89.9	58.3	1850.60
.61	.00	10.51	.00	.000	.016	.000	.000	1846.10	9902.08
.002655	50.	50.	50.	20	13	0	-321.42	220.81	10122.88

*SECNO 20.550

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.14

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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1852.00 ELREA= 1853.00

20.550	5.72	1851.82	.00	.00	1852.07	.25	.00	.44	1852.00
1800.0	.0	1800.0	.0	.0	446.8	.0	89.9	58.4	1853.00
.61	.00	4.03	.00	.000	.016	.000	.000	1846.10	9973.47
.000269	5.	5.	5.	4	0	0	.00	102.12	10075.58

*SECNO 20.555

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .61

20.555	5.91	1852.01	.00	.00	1852.13	.11	.01	.04	1852.20
1800.0	12.0	1677.3	110.7	18.9	601.3	140.7	90.4	58.5	1853.20
.61	.63	2.79	.79	.045	.043	.045	.000	1846.10	9909.79
.000716	35.	35.	35.	2	0	0	.00	329.13	10417.50

CCHV= .300 CEHV= .500
*SECNO 20.730

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

```
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   20.730      3.36   1858.36   1858.36       .00   1859.66      1.30      1.92       .60   1862.00
   1800.0        .0    1800.0        .0        .0     196.4        .0     100.8      63.0   1865.00
      .64       .00      9.17       .00      .000      .043      .000      .000   1855.00   9942.33
  .020074      702.      947.     1002.        20        11         0       .00     75.62  10017.95


*SECNO 21.000

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.07

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   28MAR96      16:58:13                                                                          PAGE   11

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST


    21.000      6.14   1871.64       .00        .00   1872.06       .42      12.13       .27   1876.00
    1800.0        .0    1800.0        .0        .0     347.4        .0      109.7      65.9   1878.00
       .72       .00      5.18       .00      .000      .043      .000       .000   1865.50   9942.02
   .004674     1290.     1426.     1530.         7         0         0        .00    105.54  10047.56


CCHV=      .300 CEHV=      .500
*SECNO 21.240

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .43

    21.240      3.50   1883.00       .00        .00   1883.83       .83      11.57       .21   1888.00
    1800.0        .0    1800.0        .0        .0     246.4        .0      118.4      69.4   1888.00
       .76       .00      7.30       .00      .000      .048      .000       .000   1879.50   9670.08
   .025151     1370.     1267.     1250.         5         0         0        .00    134.64  10159.92


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   28MAR96      16:58:13                                                                          PAGE   12

 T1       SKUNK CREEK WASH
 T2       100 YEAR FREQUENCY
 T3       SKUNK CREEK

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -10       3                           .01                                     1766

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      15                  -1


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   28MAR96      16:58:13                                                                          PAGE   13
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*PROF 2

CCHV=     .300 CEHV=     .500
*SECNO 18.720
   18.720      8.79   1768.79       .00   1766.00   1769.72       .93       .00       .00   1768.00
  28100.0       1.8   25613.3    2484.8       1.2    3199.7     621.8        .0        .0   1768.00
      .00      1.57      8.00      4.00      .050      .048      .050      .000   1760.00   9447.03
  .010026        0.        0.        0.         0         0         5       .00   1236.32  10683.35

*SECNO 18.950

3265 DIVIDED FLOW

   18.950      9.80   1781.30       .00       .00   1782.37      1.06     12.58       .07   1780.00
  28100.0      39.4   27672.8     387.8      17.0    3320.5     190.8     102.3      33.7   1780.00
      .04      2.31      8.33      2.03      .050      .048      .050      .000   1771.50   9233.91
  .010727     1200.     1214.     1200.         4         0         0       .00   1189.07  10625.85

*SECNO 19.160

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.41

   19.160      7.96   1789.96       .00       .00   1790.67       .71      8.19       .11   1788.00
  28100.0    2354.4   25632.3     113.4     635.9    3668.3      52.7     202.4      61.9   1788.00
      .09      3.70      6.99      2.15      .050      .048      .050      .000   1782.00   9573.09
  .005405     1100.     1109.     1040.         5         0         0       .00   1060.73  10633.82

CCHV=     .300 CEHV=     .500
*SECNO 19.380

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
   19.380      8.00   1800.00   1800.00       .00   1801.86      1.86     10.46       .58   1800.00
  28100.0        .0   28100.0        .0        .0    2565.9        .0     294.9      86.0   1800.00
      .12       .04     10.95       .00      .045      .043      .000      .000   1792.00   9689.80
  .017866     1180.     1162.     1150.         3         5         0       .00    740.39  10660.05

1
   28MAR96      16:58:13                                                                          PAGE   14

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 19.580

3301 HV CHANGED MORE THAN HVINS

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.52
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    19.580      8.36   1812.86       .00       .00   1813.94      1.08     11.84       .23   1812.00
   28100.0      49.0   28031.1      19.9      29.7    3351.4      12.1     367.1     105.1   1812.00
       .15      1.65      8.36      1.65      .045      .043      .045      .000   1804.50   9581.08
   .007687     1110.     1056.     1100.         5         0         0       .00    826.91  10408.00


*SECNO 19.920
    19.920     10.57   1826.07       .00       .00   1826.69       .62     12.61       .14   1824.00
   28100.0    2996.3   25074.7      28.9     486.7    3961.6      10.7     526.2     148.8   1824.00
       .23      6.16      6.33      2.71      .045      .043      .045      .000   1815.50   8742.50
   .006619     1330.     1795.     1840.         7         0         0       .00   1357.83  10100.33


*SECNO 20.230

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .68

    20.230      7.26   1841.26   1841.10       .00   1842.33      1.07     15.42       .22   1840.00
   28100.0    5407.6   20311.9    2380.5     801.2    2329.2     309.2     675.0     198.3   1838.00
       .28      6.75      8.72      7.70      .045      .043      .045      .000   1834.00   8941.17
   .014366     1670.     1637.     1630.         9        18         0       .00   1266.50  10207.67


*SECNO 20.390

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.49

    20.390      7.79   1849.79       .00       .00   1850.43       .64      7.97       .13   1845.00
   28100.0    4936.5   20066.3    3097.2     874.8    3059.8     450.5     753.3     224.1   1844.00
       .32      5.64      6.56      6.87      .045      .043      .045      .000   1842.00   9208.06
   .006435     1100.      845.      550.         3         0         0       .00   1292.55  10500.61


*SECNO 20.530
1
   28MAR96      16:58:13                                                                          PAGE   15

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3301 HV CHANGED MORE THAN HVINS

    20.530      9.84   1854.64       .00       .00   1855.82      1.18      5.12       .27   1852.00
   28100.0    6087.1   11673.3   10339.7    1275.9    1005.6    1626.9     825.1     247.2   1853.00
       .35      4.77     11.61      6.36      .045      .043      .045      .000   1844.80   9324.19
   .007429      990.      740.      540.         3         0         0       .00   1307.56  10631.75


CCHV=     .300 CEHV=     .500
*SECNO 20.533
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    20.533     10.34   1855.44   1855.44       .00   1857.08      1.64       .06       .23   1854.00
   28100.0    4384.9   16166.8    7548.3    1427.0    1229.1    1783.9     827.5     248.0   1853.00
       .35      3.07     13.15      4.23      .030      .016      .030      .000   1845.10   9263.24
   .001264       25.       25.       25.        20         8         0       .00   1389.70  10652.93


*SECNO 20.540

3301 HV CHANGED MORE THAN HVINS
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3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.51

3370 NORMAL BRIDGE, NRD=  49 MIN ELTRD=  1849.98 MAX ELLC=  1851.80

    20.540     11.87   1856.97       .00       .00   1857.44       .47       .00       .35   1851.80
   28100.0    5048.6   15223.4    7828.0    1966.7    2233.0    2171.4     828.1     248.1   1849.80
       .35      2.57      6.82      3.60      .030      .016      .030      .000   1845.10   9117.66
   .000554        5.        5.        5.         4         0         0   -553.30   1528.20  10645.86

*SECNO 20.544

3370 NORMAL BRIDGE, NRD=  49 MIN ELTRD=  1850.98 MAX ELLC=  1852.60

    20.544     10.76   1856.86       .00       .00   1857.62       .76       .04       .15   1852.60
   28100.0    4098.9   16174.9    7826.2    1345.8    1896.0    1732.2     834.6     249.8   1850.60
       .35      3.05      8.53      4.52      .030      .016      .030      .000   1846.10   9185.30
   .001051       50.       50.       50.         2         0         0   -611.79   1378.58  10563.88
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 20.550

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
    20.550     10.56   1856.66   1856.66       .00   1858.12      1.46       .01       .35   1852.00
   28100.0    5627.8   13333.8    9138.4    1604.8     994.9    2033.9     835.2     250.0   1853.00
       .35      3.51     13.40      4.49      .030      .016      .030      .000   1846.10   9361.75
   .001186        5.        5.        5.         3         6         0       .00   1269.40  10631.16

*SECNO 20.555
3280 CROSS SECTION     20.56 EXTENDED       .61 FEET

3301 HV CHANGED MORE THAN HVINS

    20.555     12.02   1858.12       .00       .00   1858.49       .37       .05       .33   1852.20
   28100.0    7692.4    8865.3   11542.3    2450.0    1295.6    2868.2     839.7     251.1   1853.20
       .35      3.14      6.84      4.02      .045      .043      .045      .000   1846.10   9172.00
   .001602       35.       35.       35.         4         0         0       .00   1553.00  10725.00

CCHV=     .300 CEHV=     .500
*SECNO 20.730

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
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```
    20.730     10.10   1865.10   1865.10       .00   1866.48      1.38      3.28       .50   1862.00
   28100.0    2958.5   24476.6     664.9     490.1    2479.5     173.0     939.4     280.3   1865.00
       .38      6.04      9.87      3.84      .045      .043      .045      .000   1855.00   8637.33
   .014316      702.      947.     1002.        20         9         0       .00   1398.16  10391.00

*SECNO 21.000
1
   28MAR96      16:58:13                                                                          PAGE   17

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3265 DIVIDED FLOW


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.50

    21.000     13.31   1878.81       .00       .00   1879.54       .72     12.85       .20   1876.00
   28100.0    6417.6   20254.8    1427.7    1013.0    2827.8     484.2    1060.1     326.8   1878.00
       .44      6.33      7.16      2.95      .045      .043      .045      .000   1865.50   8699.65
   .006331     1290.     1426.     1530.         8         0         0       .00   1472.10  10487.20


CCHV=     .300 CEHV=     .500
*SECNO 21.240

3301 HV CHANGED MORE THAN HVINS

    21.240      9.49   1888.99       .00       .00   1890.27      1.27     10.46       .27   1888.00
   28100.0      23.6   28024.5      51.9      12.1    3093.2      26.7    1169.7     359.3   1888.00
       .48      1.94      9.06      1.94      .050      .048      .050      .000   1879.50   9545.35
   .010972     1370.     1267.     1250.         4         0         0       .00    738.87  10284.22


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   28MAR96      16:58:13                                                                          PAGE   18


                                                                    THIS RUN EXECUTED 28MAR96     16:58:13
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************


NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST


# 241746-02-0300

SUMMARY PRINTOUT

      SECNO       Q       CWSEL     CRIWS      VCH      XLCH      STCHL     STCHR     STENCL    STENCR     SSTA      ENDST

      18.720  1800.00   1764.60   1764.56      5.49       .00   9450.00  10220.00       .00       .00   9810.01  10169.00
```

	18.720	28100.00	1768.79	.00	8.00	.00	9450.00	10220.00	.00	.00	9447.03	10683.35
*	18.950	1800.00	1775.82	.00	3.40	1214.00	9260.00	10050.00	.00	.00	9351.75	10039.56
	18.950	28100.00	1781.30	.00	8.33	1214.00	9260.00	10050.00	.00	.00	9233.91	10625.85
*	19.160	1800.00	1784.82	.00	4.76	1109.00	9900.00	10580.00	.00	.00	10011.76	10568.09
*	19.160	28100.00	1789.96	.00	6.99	1109.00	9900.00	10580.00	.00	.00	9573.09	10633.82
*	19.380	1800.00	1796.64	.00	3.13	1162.00	9960.00	10660.00	.00	.00	9968.39	10634.84
*	19.380	28100.00	1800.00	1800.00	10.95	1162.00	9960.00	10660.00	.00	.00	9689.80	10660.05
*	19.580	1800.00	1807.22	1807.22	6.59	1056.00	9650.00	10380.00	.00	.00	9915.21	10231.74
*	19.580	28100.00	1812.86	.00	8.36	1056.00	9650.00	10380.00	.00	.00	9581.08	10408.00
*	19.920	1800.00	1821.87	.00	3.95	1795.00	8920.00	10090.00	.00	.00	8835.99	10058.03
	19.920	28100.00	1826.07	.00	6.33	1795.00	8920.00	10090.00	.00	.00	8742.50	10100.33
*	20.230	1800.00	1836.53	1836.53	7.23	1637.00	9310.00	10070.00	.00	.00	9676.95	10032.63
*	20.230	28100.00	1841.26	1841.10	8.72	1637.00	9310.00	10070.00	.00	.00	8941.17	10207.67
*	20.390	1800.00	1845.71	.00	3.62	845.00	9500.00	10340.00	.00	.00	9475.48	10391.26
*	20.390	28100.00	1849.79	.00	6.56	845.00	9500.00	10340.00	.00	.00	9208.06	10500.61
	20.530	1800.00	1849.24	.00	5.15	740.00	9961.00	10090.00	.00	.00	9971.76	10075.88
	20.530	28100.00	1854.64	.00	11.61	740.00	9961.00	10090.00	.00	.00	9324.19	10631.75
*	20.533	1800.00	1849.38	.00	4.56	25.00	9949.00	10101.00	.00	.00	9958.83	10076.40
*	20.533	28100.00	1855.44	1855.44	13.15	25.00	9949.00	10101.00	.00	.00	9263.24	10652.93
*	20.540	1800.00	1848.66	1848.66	10.77	5.00	9840.00	10140.00	.00	.00	9908.42	10108.64
*	20.540	28100.00	1856.97	.00	6.82	5.00	9840.00	10140.00	.00	.00	9117.66	10645.86

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	SECNO	Q	CWSEL	CRIWS	VCH	XLCH	STCHL	STCHR	STENCL	STENCR	SSTA	ENDST
*	20.544	1800.00	1849.91	1849.91	10.51	50.00	9840.00	10140.00	.00	.00	9902.08	10122.88
	20.544	28100.00	1856.86	.00	8.53	50.00	9840.00	10140.00	.00	.00	9185.30	10563.88
*	20.550	1800.00	1851.82	.00	4.03	5.00	9965.00	10079.00	.00	.00	9973.47	10075.58
*	20.550	28100.00	1856.66	1856.66	13.40	5.00	9965.00	10079.00	.00	.00	9361.75	10631.16
*	20.555	1800.00	1852.01	.00	2.79	35.00	9965.00	10079.00	.00	.00	9909.79	10417.50
	20.555	28100.00	1858.12	.00	6.84	35.00	9965.00	10079.00	.00	.00	9172.00	10725.00
*	20.730	1800.00	1858.36	1858.36	9.17	947.00	9440.00	10110.00	.00	.00	9942.33	10017.95
*	20.730	28100.00	1865.10	1865.10	9.87	947.00	9440.00	10110.00	.00	.00	8637.33	10391.00
*	21.000	1800.00	1871.64	.00	5.18	1426.00	9400.00	10070.00	.00	.00	9942.02	10047.56
*	21.000	28100.00	1878.81	.00	7.16	1426.00	9400.00	10070.00	.00	.00	8699.65	10487.20
*	21.240	1800.00	1883.00	.00	7.30	1267.00	9570.00	10230.00	.00	.00	9670.08	10159.92
	21.240	28100.00	1888.99	.00	9.06	1267.00	9570.00	10230.00	.00	.00	9545.35	10284.22

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241746-02-0300

SUMMARY PRINTOUT

SECNO	QLOB	QCH	QROB	VLOB	VCH	VROB	TELMX	CWSEL	DIFKWS	TOPWID	ELMIN	ALPHA

	18.720	.00	1800.00	.00	.00	5.49	.00	1780.00	1764.60	.00	358.99	1760.00	1.00
	18.720	1.84	25613.34	2484.82	1.57	8.00	4.00	1780.00	1768.79	2.79	1236.32	1760.00	1.11
*	18.950	.00	1800.00	.00	.00	3.40	.00	1792.00	1775.82	.00	228.62	1771.50	1.00
	18.950	39.36	27672.83	387.81	2.31	8.33	2.03	1792.00	1781.30	.00	1189.07	1771.50	1.08
*	19.160	.00	1800.00	.00	.00	4.76	.00	1800.00	1784.82	.00	402.35	1782.00	1.00
*	19.160	2354.39	25632.25	113.36	3.70	6.99	2.15	1800.00	1789.96	.00	1060.73	1782.00	1.10
*	19.380	.00	1800.00	.00	.00	3.13	.00	1816.50	1796.64	.00	408.06	1792.00	1.00
*	19.380	.00	28100.00	.00	.04	10.95	.00	1816.50	1800.00	.00	740.39	1792.00	1.00
*	19.580	.00	1800.00	.00	.00	6.59	.00	1824.00	1807.22	.00	201.63	1804.50	1.00
*	19.580	49.01	28031.08	19.91	1.65	8.36	1.65	1824.00	1812.86	.00	826.91	1804.50	1.02
*	19.920	85.29	1714.71	.00	1.95	3.95	.00	1840.00	1821.87	.00	218.59	1815.50	1.06
	19.920	2996.33	25074.74	28.94	6.16	6.33	2.71	1840.00	1826.07	.00	1357.83	1815.50	1.00
*	20.230	.00	1800.00	.00	.00	7.23	.00	1851.50	1836.53	.00	155.90	1834.00	1.00
*	20.230	5407.59	20311.92	2380.50	6.75	8.72	7.70	1851.50	1841.26	.00	1266.50	1834.00	1.03
*	20.390	10.64	1471.09	318.27	1.24	3.62	3.78	1860.00	1845.71	.00	324.04	1842.00	1.02
*	20.390	4936.49	20066.29	3097.22	5.64	6.56	6.87	1860.00	1849.79	.00	1292.55	1842.00	1.01
	20.530	.00	1800.00	.00	.00	5.15	.00	1856.00	1849.24	.00	104.12	1844.80	1.00
	20.530	6087.08	11673.27	10339.65	4.77	11.61	6.36	1856.00	1854.64	.00	1307.56	1844.80	1.47
*	20.533	.00	1800.00	.00	.00	4.56	.00	1857.00	1849.38	.00	117.57	1845.10	1.00
*	20.533	4384.85	16166.84	7548.30	3.07	13.15	4.23	1857.00	1855.44	.00	1389.70	1845.10	2.64
*	20.540	.00	1800.00	.00	.00	10.77	.00	1857.00	1848.66	.00	200.22	1845.10	1.00
*	20.540	5048.63	15223.40	7827.96	2.57	6.82	3.60	1857.00	1856.97	.00	1528.20	1845.10	1.54
*	20.544	.00	1800.00	.00	.00	10.51	.00	1857.80	1849.91	.00	220.81	1846.10	1.00
	20.544	4098.93	16174.89	7826.18	3.05	8.53	4.52	1857.80	1856.86	.00	1378.58	1846.10	1.53
*	20.550	.00	1800.00	.00	.00	4.03	.00	1857.50	1851.82	.00	102.12	1846.10	1.00
*	20.550	5627.75	13333.82	9138.43	3.51	13.40	4.49	1857.50	1856.66	.00	1269.40	1846.10	2.56
*	20.555	11.99	1677.29	110.72	.63	2.79	.79	1857.50	1852.01	.00	329.13	1846.10	1.30
	20.555	7692.41	8865.32	11542.28	3.14	6.84	4.02	1857.50	1858.12	.00	1553.00	1846.10	

```
    1.34

*     20.730       .00   1800.00       .00       .00      9.17       .00   1876.00   1858.36       .00     75.62   1855.00
    1.00
*     20.730   2958.45  24476.60    664.95      6.04      9.87      3.84   1876.00   1865.10       .00   1398.16   1855.00
    1.11

*     21.000       .00   1800.00       .00       .00      5.18       .00   1884.00   1871.64       .00    105.54   1865.50
    1.00
*     21.000   6417.56  20254.76   1427.68      6.33      7.16      2.95   1884.00   1878.81       .00   1472.10   1865.50
    1.10

1
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      SECNO      QLOB       QCH      QROB      VLOB       VCH      VROB     TELMX     CWSEL    DIFKWS    TOPWID     ELMIN
    ALPHA

*     21.240       .00   1800.00       .00       .00      7.30       .00   1900.00   1883.00       .00    134.64   1879.50
    1.00
      21.240     23.59  28024.50     51.91      1.94      9.06      1.94   1900.00   1888.99       .00    738.87   1879.50
    1.02

1
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# 241746-02-0300

SUMMARY PRINTOUT

      SECNO      XLCH    K*CHSL        EG        HV        HL     OLOSS     10*KS       VOL     DEPTH     K*XNL    K*XNCH
    K*XNR

      18.720       .00       .00   1765.07       .47       .00       .00    356.62       .00      4.60       .00     48.00
     .00
      18.720       .00       .00   1769.72       .93       .00       .00    100.26       .00      8.79     50.00     48.00
   50.00

*     18.950   1214.00      9.47   1776.00       .18     10.85       .09     39.75     11.94      4.32       .00     48.00
     .00
      18.950   1214.00      9.47   1782.37      1.06     12.58       .07    107.27    102.30      9.80     50.00     48.00
   50.00

*     19.160   1109.00      9.47   1785.18       .35      9.09       .09    257.16     23.49      2.82       .00     48.00
     .00
*     19.160   1109.00      9.47   1790.67       .71      8.19       .11     54.05    202.42      7.96     50.00     48.00
   50.00

*     19.380   1162.00      8.61   1796.80       .15     11.56       .06     52.40     36.20      4.64       .00     43.00
     .00
*     19.380   1162.00      8.61   1801.86      1.86     10.46       .58    178.66    294.88      8.00     45.00     43.00
     .00

*     19.580   1056.00     11.84   1807.89       .68     10.33       .26    243.85     46.47      2.72       .00     43.00
     .00
*     19.580   1056.00     11.84   1813.94      1.08     11.84       .23     76.87    367.13      8.36     45.00     43.00
   45.00

*     19.920   1795.00      6.13   1822.10       .23     14.08       .13     38.53     61.71      6.37     45.00     43.00
     .00
      19.920   1795.00      6.13   1826.69       .62     12.61       .14     66.19    526.17     10.57     45.00     43.00
   45.00

*     20.230   1637.00     11.30   1837.34       .81     12.80       .29    236.01     75.38      2.53       .00     43.00
     .00
```

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*    20.230   1637.00     11.30   1842.33      1.07     15.42       .22    143.66    675.05      7.26     45.00     43.00
  45.00

*    20.390    845.00      9.47   1845.92       .21      8.40       .18     56.96     82.38      3.71     45.00     43.00
  45.00
*    20.390    845.00      9.47   1850.43       .64      7.97       .13     64.35    753.27      7.79     45.00     43.00
  45.00

     20.530    740.00      3.78   1849.65       .41      3.63       .10     44.62     89.42      4.44       .00     43.00
    .00
     20.530    740.00      3.78   1855.82      1.18      5.12       .27     74.29    825.12      9.84     45.00     43.00
  45.00

*    20.533     25.00     12.00   1849.70       .32       .03       .03      4.85     89.63      4.28       .00     16.00
    .00
*    20.533     25.00     12.00   1857.08      1.64       .06       .23     12.64    827.52     10.34     30.00     16.00
  30.00

*    20.540      5.00       .00   1850.46      1.80       .01       .74     32.55     89.67      3.56       .00     16.00
    .00
*    20.540      5.00       .00   1857.44       .47       .00       .35      5.54    828.14     11.87     30.00     16.00
  30.00

*    20.544     50.00     20.00   1851.63      1.72       .15       .03     26.55     89.86      3.81       .00     16.00
    .00
     20.544     50.00     20.00   1857.62       .76       .04       .15     10.51    834.65     10.76     30.00     16.00
  30.00

*    20.550      5.00       .00   1852.07       .25       .00       .44      2.69     89.90      5.72       .00     16.00
    .00
*    20.550      5.00       .00   1858.12      1.46       .01       .35     11.86    835.20     10.56     30.00     16.00
  30.00

*    20.555     35.00       .00   1852.13       .11       .01       .04      7.16     90.38      5.91     45.00     43.00
  45.00
     20.555     35.00       .00   1858.49       .37       .05       .33     16.02    839.72     12.02     45.00     43.00
  45.00

*    20.730    947.00      9.40   1859.66      1.30      1.92       .60    200.74    100.82      3.36       .00     43.00
    .00
*    20.730    947.00      9.40   1866.48      1.38      3.28       .50    143.16    939.42     10.10     45.00     43.00
  45.00

*    21.000   1426.00      7.36   1872.06       .42     12.13       .27     46.74    109.72      6.14       .00     43.00
    .00
*    21.000   1426.00      7.36   1879.54       .72     12.85       .20     63.31   1060.09     13.31     45.00     43.00
  45.00

1
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     SECNO      XLCH     K*CHSL       EG        HV        HL     OLOSS     10*KS       VOL     DEPTH     K*XNL    K*XNCH
   K*XNR

*    21.240   1267.00      11.05   1883.83       .83     11.57       .21    251.51    118.36      3.50       .00     48.00
    .00
     21.240   1267.00      11.05   1890.27      1.27     10.46       .27    109.72   1169.65      9.49     50.00     48.00
  50.00

1
  28MAR96      16:58:13                                                                                          PAGE   24
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SUMMARY OF ERRORS AND SPECIAL NOTES

```
WARNING SECNO=     18.950  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     19.160  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     19.160  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     19.380  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     19.380  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     19.380  PROFILE=  2  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=     19.580  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     19.580  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     19.580  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     19.920  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     20.230  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.230  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     20.230  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     20.390  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     20.390  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     20.533  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     20.533  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.533  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.533  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     20.540  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.540  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     20.540  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     20.544  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.544  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.544  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     20.550  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     20.550  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.550  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     20.555  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     20.730  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     20.730  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     20.730  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     20.730  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     21.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     21.000  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
1
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WARNING SECNO=     21.240  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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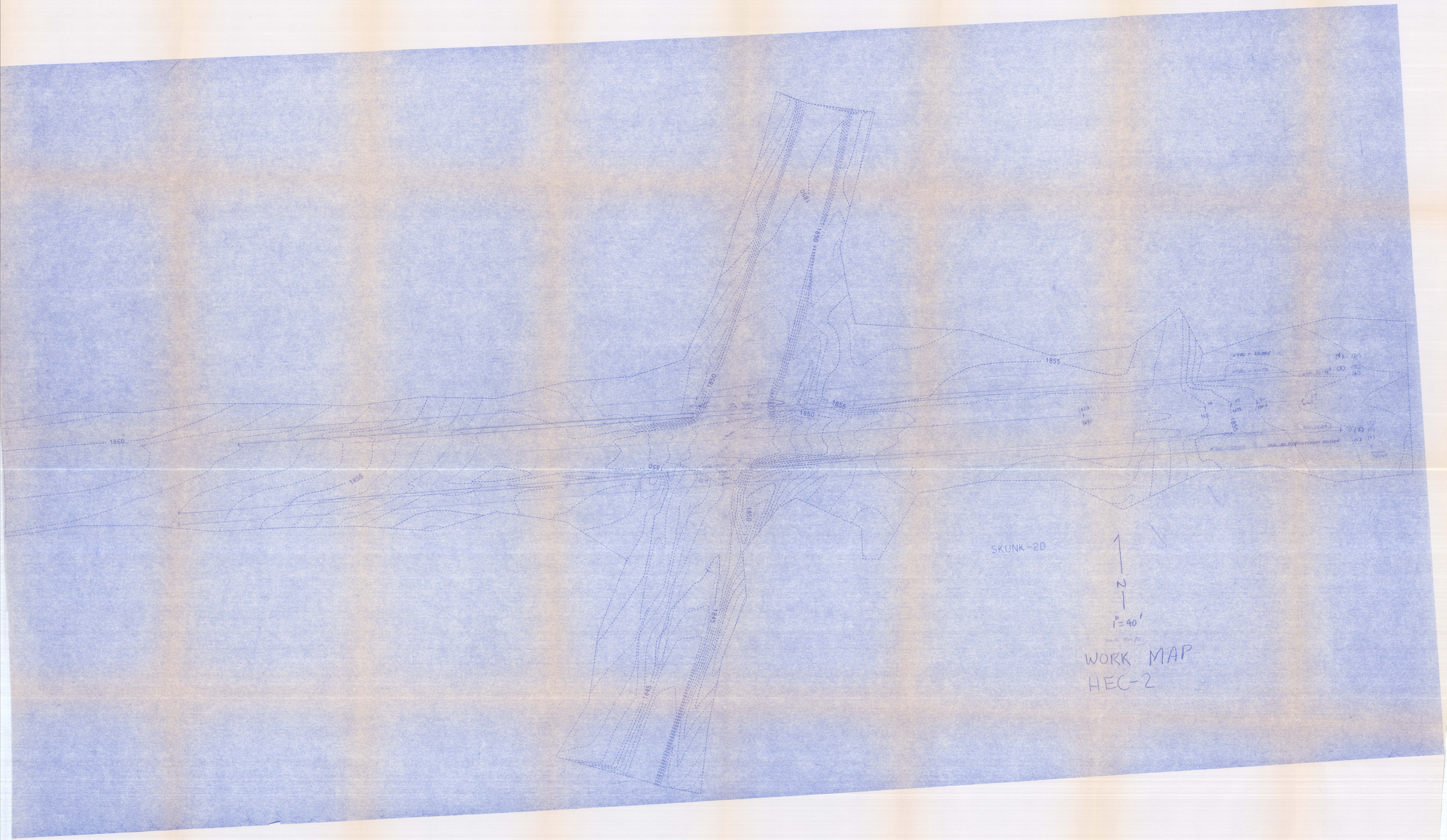
APPENDIX C

HEC-2 Cross-Section Map


1860
1855
1850
1845
SKUNK-2D
N
1"=40'
WORK MAP
HEC-2

APPENDIX D

Scour Calculations

SUBJECT: Desert Hills Drive

JOB NO.: 241746-07-0300

Scour Depth Summary

1. Sample B1 depth = 16'
2. Sample B2 depth = 6'
3. Sample B3 depth = 11'
4. Scour depth range for various scour equations 3' to 12.5'
5. Use Sample B2 and Sample B3 for scour depth estimations

6. Use Rational Methods for estimation of scour downstream of Desert Hills
7. Roadway Crossing of Skunk Creek.
8. Design for Q_{100}
9. Q_{100} overtops proposed box culvert

Rational Method Summary

Design Event	Equation	Sample ID	Scour Depth (ft)	Average Depth of Scour Between Sample Types	Average Depth of Scour Between Equations
Q100	36	B2	7.7	8.05	
Q100	36	B3	8.4		
Q100	34	B2	5.23	5.58	
Q100	34	B3	5.94		
Q100	35	*	10	10	

* independent of Sample Type

Use a 1.3 safety factor

7.87' × 1.3 = 10.24'

Estimated Scour Depth

Use 10' depth for scour protection upstream of Proposed Box Culvert

downstream

PREPARED BY: PJE DATE: 3/96 CHECKED BY: RJS SHEET NO.: 1 OF 7

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SUBJECT:

JOB NO.:

Scour Depth Summary Cont.

11. Use Regime methods to estimate scour depth upstream of Desert Hills Roadway crossing of Skunk Creek

Regime Method Summary

Design Event	Equation	Sample ID	Scour Depth (Ft)	Average Depth of Scour Between Sample Types	Average Depth of Scour Between Equations	Use a 1.3 Safty Factor
Q100	26	B2	3.1'	3.45'	7.22 x 1.3 = 9.4' Estimated Scour Depth	
Q100	26	B3	3.8'			
Q100	27	B2	10.6'	11.0'		
Q100	27	B3	11.4'			

use 9' depth for scour protection (upstream of Proposed Box Culvert)

12 See Desert Hills Drive at Skunk Creek Roadway Improvement Plans. (Seperate Attachment)

PREPARED BY: PJE DATE: 3/96 CHECKED BY: RJS SHEET NO.: 2 OF 7

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SUBJECT: Desert Hills Drive

JOB NO.: 241746-02-0300

Scour Equation 26

Estimate Scour potential upstream of Desert Hills Drive.

Regime Approach

Given 1. Use equation 26 (Computing Degradation and Local Scour - U.S. Department of Interior Bureau of Reclamation, 1984)

eq. (26) $d_m = 0.47 (Q/F)^{1/3}$

d_m = mean depth at design discharge, ft

Q = Design discharge ft^3/sec (Channel Q)

F = Laceys silt factor equals $1.76 (D_m)^{1/2}$ where D_m equals mean grain size of bed material in millimeters.

d_s = Scour depth = $z \times d_m$ $z = 0.5$
z from Table 7

Design Event	Sample 1 d50 (mm)	Sample 2 d50 (mm)	Sample 3 d50 (mm)	Q cfs	F	dm (ft)	ds (ft)
Q100	1mm			13,551.8	1.76	9.25	4.6
Q100		9.5mm		13,551.8	5.42	6.21	3.1
Q100			3.2mm	13,551.8	3.15	7.62	3.8
			4.75mm from gradation curve - App. E.			7.6	3.6

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SUBJECT: Desert Hills Drive

JOB NO.: 241746-02-0300

Scour Equation 27

Estimate Scour Potential upstream of Desert Hills Drive.
Regime Approach

Given 1 Use equation 27 (Computing Degradation and Local Scour – U.S. Department of Interior Bureau of Reclamation 1984).

$$eq.\ 27 \quad dFo = qf^{2/3} / Fbo^{1/3}$$

dFo = Depth for zero bed sediment transport (ft)
qf = Design flood discharge per unit width, cfs
Fbo = Blench's "zero bed factor" ft/s^2 (from figure 9)

ds = Scour depth = z × dm z = 0.60
z From Table 7

Design Event	Sample B1 d50 (mm)	Sample B2 d50 (mm)	Sample B2 d50 (mm)	qf	Fbo	dFo	ds
Q100	1mm			128	1.8	20.9	12.5
Q100		9.5mm		128	3.0	17.6	10.56
Q100			3.2mm	128	2.4	19	11.44
			4.75mm				

From gradation curve

PREPARED BY: PJE DATE: 3/96 CHECKED BY: RJS SHEET NO.: OF 47

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SUBJECT: Desert Hills Drive

JOB NO.: 24174602-0300

Estimate Scour at channel crossing of Desert Hills Drive

Given 1. Use Channel Q_{100} at xsec 20.53 = 16,166 cfs

2. Width (Bank to BANK) = 152'

3. Use equation (36) (Computing Degradation and Local Scour U.S. Department of the Interior Bureau of Reclamation, 1984)

$$(36) = K \left(\frac{q^{0.82}}{D_{85}^{0.23}}\right)\left(\frac{d_m}{q^{2/3}}\right)^{0.43} - d_m$$

d_s = Depth of scour below streambed (Ft)

K = 1.95

q = Design discharge per unit with (cfs/ft)

D85 = Particle size for which 85 percent is finer than (mm)

d_m = Downstream mean water depth

Sample ID.	K		q	D85	dm	ds
B1	1.95		106	9	9.8	15.13
B2	1.95		106	42	9.8	7.7
B3	1.95		106	35	9.8	8.44

PREPARED BY: PJE DATE: 3/96 CHECKED BY: BJS SHEET NO.: 57 OF

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SUBJECT: Desert Hills Drive

JOB NO.: 24174602-0300

Estimate Scour at channel crossing of Desert Hills Drive

Given 1. Use down stream discharge of 16,166 cfs

2. Width (Bank to Bank) = ~~134~~ 152'

3. Use equation (34) (Computing Degradation and Local Scour U.S. Department of the Interior Bureau of Reclamation, 1984)

$$(34) = ds = \frac{K(H)^{0.2} q^{0.57}}{D_{90}^{0.32}} - dm$$

ds = Depth of scour below streambed (Ft)

K = 3.15

H = Vertical distance between water level upstream and downstream of structure. (Ft)

q = Design discharge per unit with (cfs/Ft)

D90 = Particle size for which 90 percent is finer than

dm = Downstream mean water depth

Sample ID.	K	H	q	D90	dm	ds
B1	3.15	2.33	106	15	9.8	12.57
B2	3.15	2.33	106	52	9.8	5.23
B3	3.5	2.33	106	45	9.8	5.94

PREPARED BY: PJE DATE: 3/96 CHECKED BY: RJS SHEET NO.: 6 OF 7

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SUBJECT: Desert Hills Drive Scour Formation 35

JOB NO.: 241746-02-0300

Estimate Scour at channel crossing of Desert Hills Drive

Given 1. Use channel Q_{100} at section 20.53 = 16,166 cfs

2. Width (Bank to Bank) = 152'

3. Use equation 35 (Computing Degradation and local Scour U.S. Department of the Interior, Bureau of Reclamation, 1984).

$$(35) \quad ds = K\, HT^{0.225}\, q^{0.54} - dm$$

ds = Maximum depth of Scour (Ft)

K = 1.32

HT = The head from upstream reservoir to tailwater level (Ft)

q = Design discharge per unit width (CFS/Ft)

dm = Downstream mean water depth

Sampel ID	K	Ht	q	dm	ds
	1.32	2.33	106	9.8	10.0

PREPARED BY: PJE DATE: 3/96 CHECKED BY: RJS SHEET NO.: 8 OF 7

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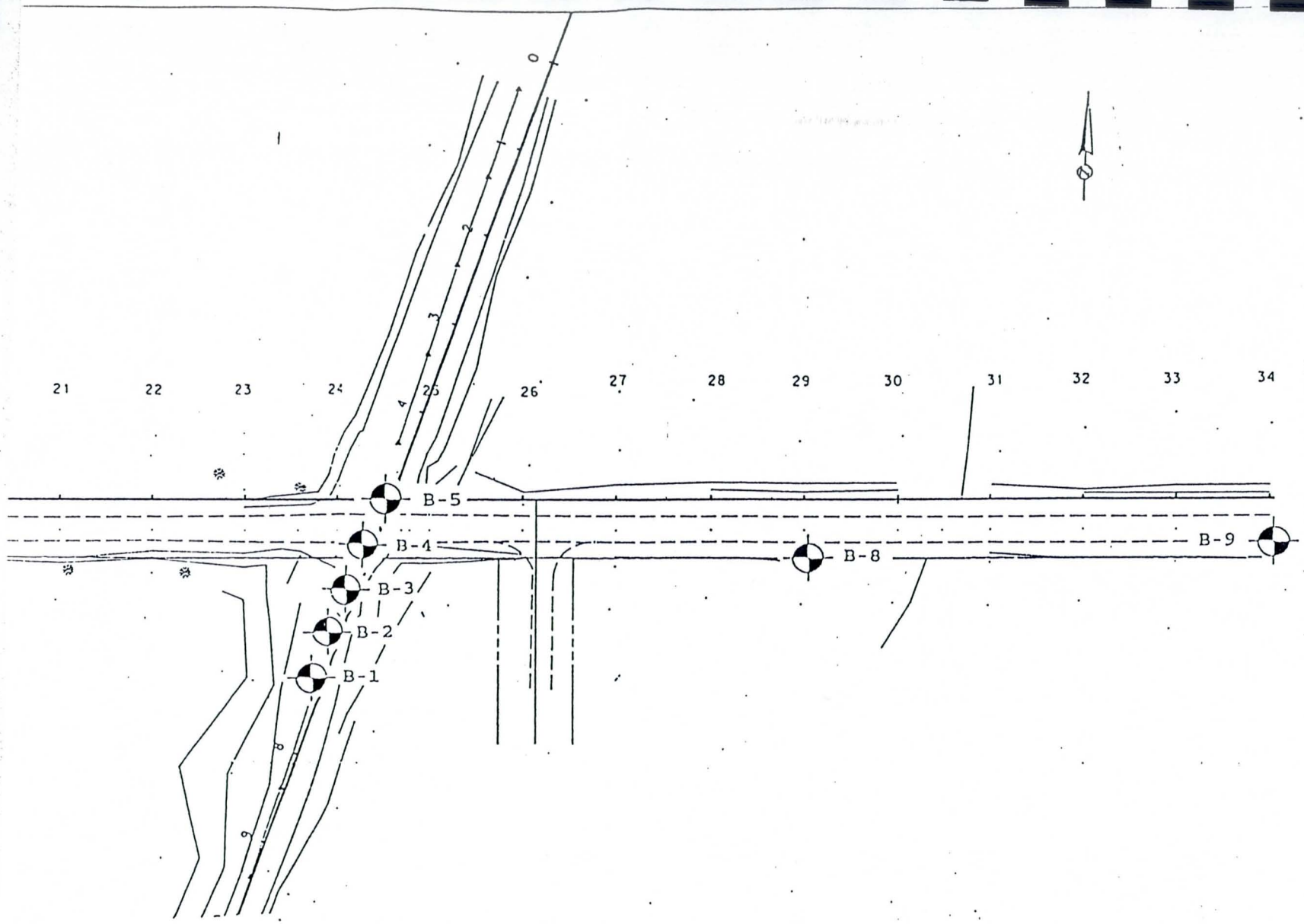
APPENDIX E

Geotechnical Report



SOIL BORING LOCATION PLAN

Road Construction
Desert Hills Dr @ Skunk Crk.
Maricopa Co., Arizona

Prepared By: MDV | Date: 08-24-95

SPEEDIE AND ASSOCIATES
GEOTECHNICAL/MATERIALS/SITE ENGINEERS

Project No. 950412SA

Rig Type: CME-55
Boring Type: Hollow Stem Auger
Surface Elevation: n/a

Depth (feet)	Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	Very Dense Brown SANDY GRAVEL (GP-Dry) With Little Clay and Cobbles and Boulders					
		S-1	4.6	--	--	50/1"
5						
	7.0					
	Very Dense Brown GRAVEL/CLAYEY GRAVEL (GW/GC-Dry) and Sand					
10						
		S-2	11.0	--	--	76/12"
	12.0					
	Hard Brown SANDY CLAY (CL-Dry) with Trace Gravel					
15	15.0					
	Very Dense Brown SAND/CLAYEY SAND (SP/SC-Dry) with Some Gravel 16.0	S-3	16.0	--	--	50/12"
	End of Boring					
20						

Boring Date: 8-23-95
Field Engineer/Technician: M. Vanhook
Driller: R. Wood
Contractor: Heber Mining

Water Level

Depth	Hour	Date
Dry		

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: B- 3

Road Construction

Desert Hills Dr. @ Skunk Creek

Maricopa County, Arizona

Project No.: 950412SA

Rig Type: CME-55
Boring Type: Hollow Stem Auger
Surface Elevation: n/a

Depth (feet)	Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	Very Dense Brown SANDY GRAVEL (GP/GC-Dry) with Little Clay and Possible Cobbles and Boulders					
5		S-1	6.0	--	--	89/12"
6.5	Very Dense Brown CLAYEY GRAVEL (GC-Dry) with Little Sand					
10		S-2	10.5	--	--	50/6"
12.5	Hard Brown GRAVELLY CLAY (CL-Dry) with Little Sand					
15		S-3	15.4	--	--	50/5"
15.4	End of Boring					
20						

Boring Date: 8-23-95
Field Engineer/Technician: M. Vanhook
Driller: R. Wood
Contractor: Heber Mining

Water Level

Depth	Hour	Date
Dry		

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: B- 2

Road Construction

Desert Hills Dr. at Skunk Creek

Maricopa County, Arizona

Project No.: 950412SA

Rig Type: CME-55
Boring Type: Hollow Stem Auger
Surface Elevation: n/a

Depth (feet)	Visual Classification	Sample Number	Depth of Sample	Natural Water Content (%)	In-place Dry Density (P.C.F.)	Penetration Resistance Blows per Foot (0 – 25 – 50)
0	Very Dense Brown SANDY GRAVEL (GP-Dry) and Cobbles with Some Boulders					
		S-1	4.7	--	--	50/3"
5						
	7.5					
	Hard Brown GRAVELLY CLAY (CG-Dry) with Some Sand					
10						
		S-2	11.0	--	--	59/12"
	13.0					
	Very Dense Brown SILTY SAND (SM-Dry) With Some Gravel					
15						
	16.0	S-3	16.0	--	--	57/12
	End of Boring					
20						

Boring Date: 8-23-95
Field Engineer/Technician: M. Vanhook
Driller: R. Wood
Contractor: Heber Mining

Water Level

Depth	Hour	Date
Dry		

SPEEDIE AND ASSOCIATES

Log of Test Boring Number: B- 1

Road Construction

Desert Hills Dr. at Skunk Creek

Maricopa County, Arizona

Project No.: 950412SA

TABULATION OF TEST DATA

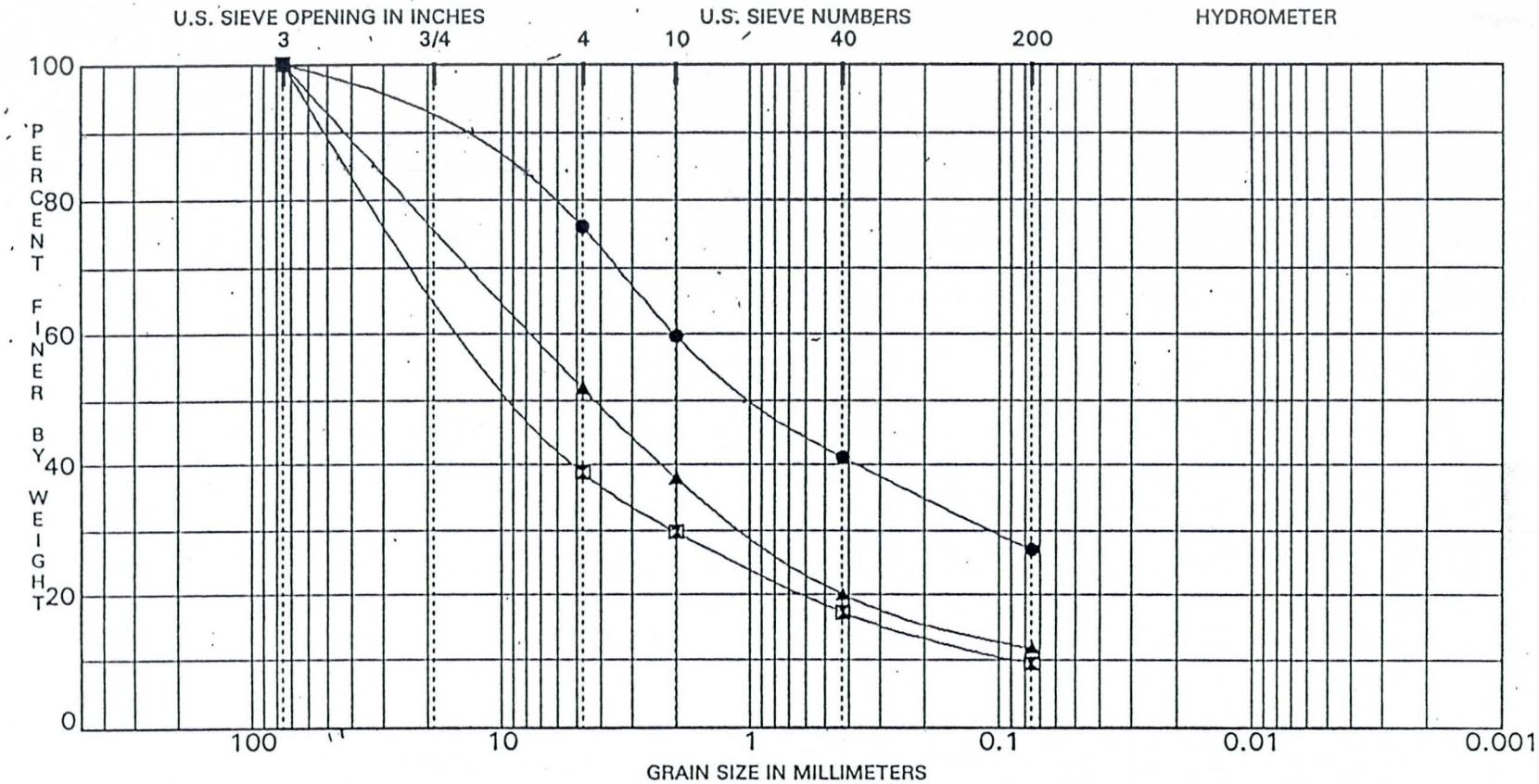
SOIL BORING or TEST PIT NUMBER	SAMPLE NUMBER	SAMPLE TYPE	DEPTH OF SAMPLE TIP	NATURAL WATER CONTENT (Percent of Dry Weight)	IN-PLACE DRY DENSITY (Pounds Per Cubic Foot)	PARTICLE SIZE DISTRIBUTION (Percent Finer)					ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	SPECIMEN DESCRIPTION
						#200 SIEVE	#40 SIEVE	#10 SIEVE	#4 SIEVE	3" SIEVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX		
B- 1	S-3	SPT	16.0	--	--	27.0	41	60	76	100	35	26	9	SM	SILTY SAND with GRAVEL
B- 2	S-1	SPT	6.0	--	--	9.5	17	30	39	100	28	17	11	GP-GC	POORLY GRADED GRAVEL with CLAY and SAND
B- 3	S-2	SPT	11.0	--	--	11.9	20	38	52	100	34	23	11	GW-GC	WELL GRADED GRAVEL with CLAY and SAND
B- 7	BS-1	BULK	5.0	--	--	72.4	82	87	90	100	38	17	21	CL	LEAN CLAY with SAND
B- 8	BS-1	BULK	3.5	--	--	26.4	38	51	58	100	28	16	12	GC	CLAYEY GRAVEL with SAND

Sheet 1 of 1

Road Construction
Desert Hills Dr. at Skunk Creek
Maricopa County, Arizona
Project No. 950412SA

SPEEDIE AND ASSOCIATES

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		ASTM Classification		LL	PL	PI	%Gravel	%Sand	%Fines
●	B- 1	16.0	SILTY SAND with GRAVEL	SM	35	26	9	24.0	49.0	27.0
⊠	B- 2	6.0	POORLY GRADED GRAVEL with CLAY and SAND	GP-GC	28	17	11	61.3	29.2	9.5
▲	B- 3	11.0	WELL GRADED GRAVEL with CLAY and SAND	GW-GC	34	23	11	48.2	39.9	11.9

Road Construction
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