LOG OF BORING NO. D-1

Project Description: PALUXY RIVER DIVERSION PROJECT
Project Location GLEN ROSE, TEXAS
Logged By: JLC
Drilled By: ADT Rig: CME75

Project No.: SOM00166
Task No.
Date: 10/10/00
Method: NQ Core

Location: 2193826 East 6776264 North
Surface El.: 801.2' MSL
Total Depth: 130 Feet

DEPTH, feet	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE RESISTANCE pp (TSF) RQD	SYMBOL	MATERIAL DESCRIPTION		UNC. COMPRESSIVE STRENGTH (tsf)	WATER CONTENT, %	UNIT DRY WEIGHT, lb/cu ft.	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	ELEVATION
						674.0							675
					Shale, with thin limestone interbeds, slightly calcareous, medium soft, gray-green.	127.2							
						671.2							
130						130.0							670
135													665
140													660
145													655
150													

Water Level Surface on

Remarks: Boring gouted upon completion.

FREESE AND NICHOLS, INC.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradu

LOG OF BORING NO. D-2

Project Description: PALUXY RIVER DIVERSION PROJECT
Project Location: GLEN ROSE, TEXAS
Logged By: JLC
Drilled By: ADT
Rig: CME75

Project No.: SOM00166
Task No.
Date: 9/20/00
Method: NQ Core

Location: 2194768 East 6777359 North
Surface El.: 710.8' MSL
Total Depth: 70 Feet

DEPTH, feet	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE RESISTANCE pp (TSF) RQD	SYMBOL	MATERIAL DESCRIPTION	UNC. COMPRESSIVE STRENGTH (tsf)	WATER CONTENT, %	UNIT DRY WEIGHT, lb/cu ft.	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	ELEVATION
	A1				Clay (CL), low plasticity, brown, dry, with limestone detritus. Auger with refusal at 5.0', which corresponds with elevation of limestone exposed in nearby creek bed. 705.8							710
5	C1		90		Limestone (Glen Rose Formation), nodular, argillaceous, medium hard, unweathered, with weathered calcareous shale interbeds at the following depths: 6.9 to 7.1' 7.3 to 7.6' 9.0 to 9.2' 5.0						68	705
					Base of weathering @ 9.2' 701.6							
10					Limestone, nodular, argillaceous, medium hard, thin to thick-bedded, light gray. 9.2							700
	C2		100								100	
	C3		67								34	
15												695
20					@ 20.1 to 21.4' - medium soft, gray shale seam, borderline argillaceous limestone							690
	C4		94		@ 24.3 to 26.4 - medium soft, gray shale						60	
25												

Water Level Surface on

Remarks: Boring grouted upon completion.

FREESE AND NICHOLS, INC.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradu

LOG OF BORING NO. D-2

Project Description: PALUXY RIVER DIVERSION PROJECT
Project Location: GLEN ROSE, TEXAS
Logged By: JLC
Drilled By: ADT
Rig: CME75

Project No.: SOM00166
Task No.
Date: 9/20/00
Method: NQ Core

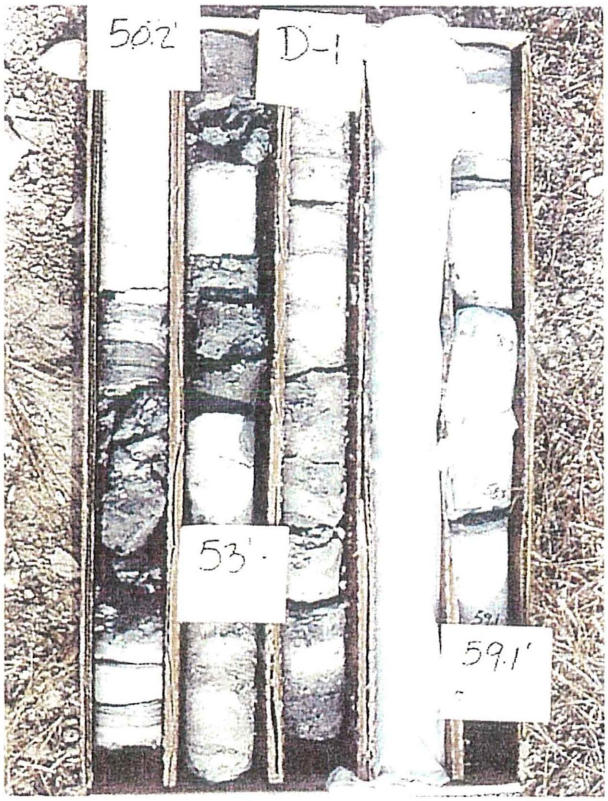
Location: 2194768 East 6777359 North
Surface El.: 710.8' MSL
Total Depth: 70 Feet

DEPTH, feet	SAMPLE TYPE	SAMPLE RECOVERY (%)	SAMPLE RESISTANCE pp (TSF) RQD	SYMBOL	MATERIAL DESCRIPTION	UNC. COMPRESSIVE STRENGTH (tsf)	WATER CONTENT, %	UNIT DRY WEIGHT, lb/cu ft.	% PASSING NO. 200 SIEVE	LIQUID LIMIT	PLASTIC LIMIT	ELEVATION
					interbed							685
					@ 26.7 to 27.2' - vertical, poorly healed, joint							
	C5		100								100	
30												680
35												675
					672.8							
	C6		100		Marker Bed, Shale, gray-green, with interbeds of limestone and siltstone. Shale from 38.0 to 38.6' could be remoulded with finger pressure. Most of the shale was disturbed, probably mechanically. 38.0						37	
40												670
					669.3							
	C7		100		Limestone, nodular, argillaceous, medium hard, thin to thick-bedded, light gray. Medium soft, gray shale interbeds @ the following depths: 41.5 46.5 to 47.0' 48.6 to 49.1' 50.5 to 50.9' 51.6 to 51.9' 60.0 to 63.4'						90	
45												665
50												

Water Level Surface on

Remarks: Boring grouted upon completion.

The stratification lines represent approximate strata boundaries. In situ, the transition may be gradua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53'
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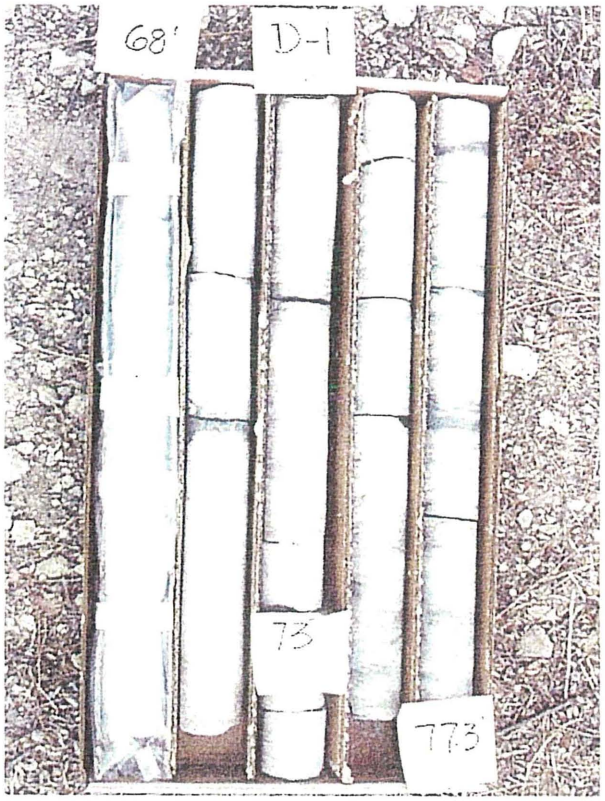
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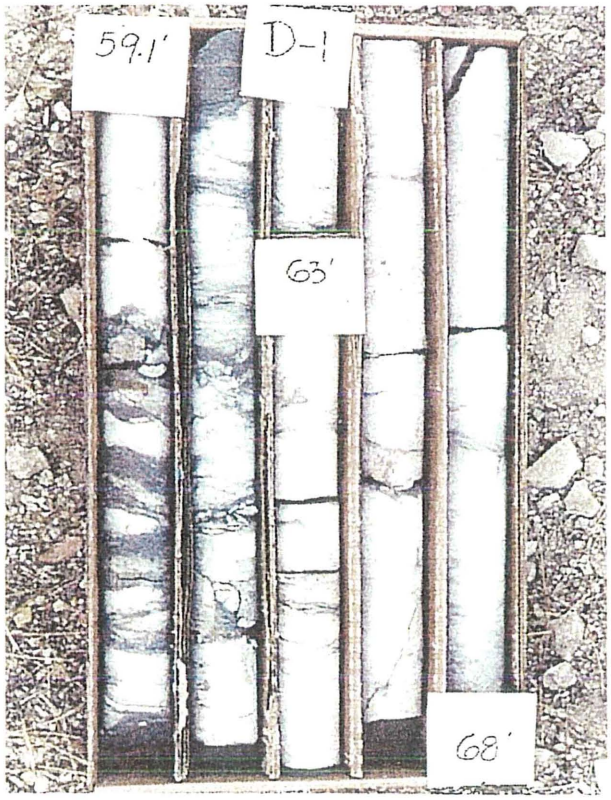
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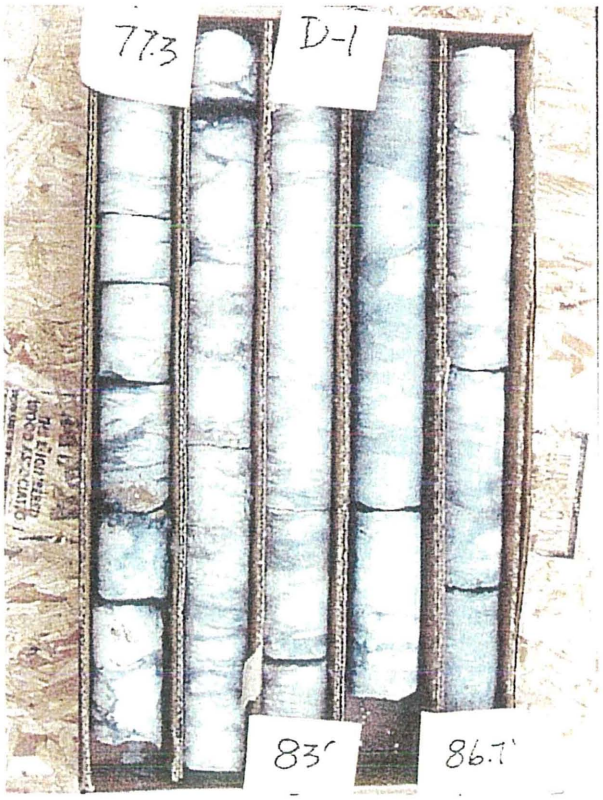
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D-1
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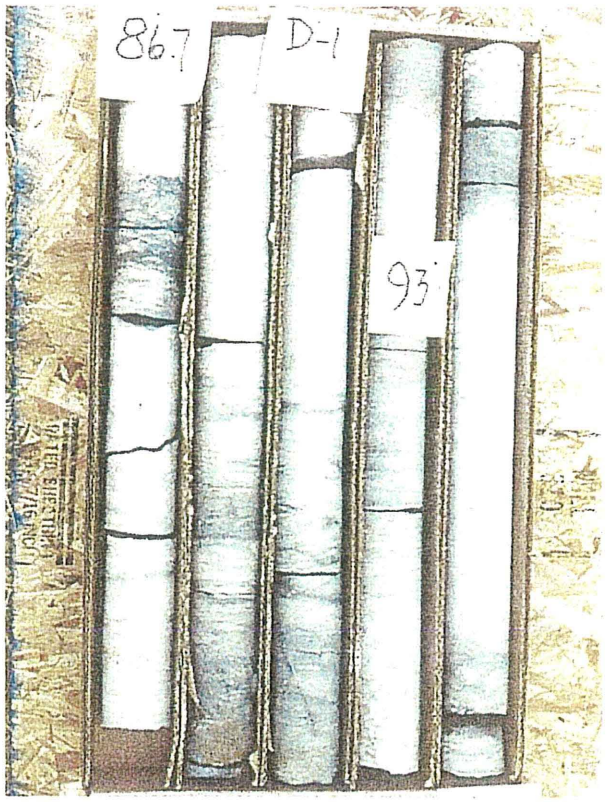
86.7'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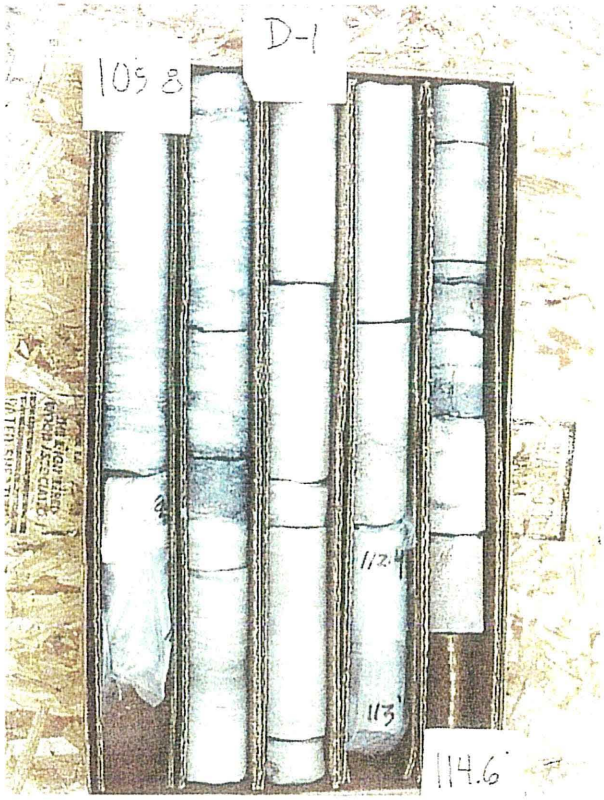
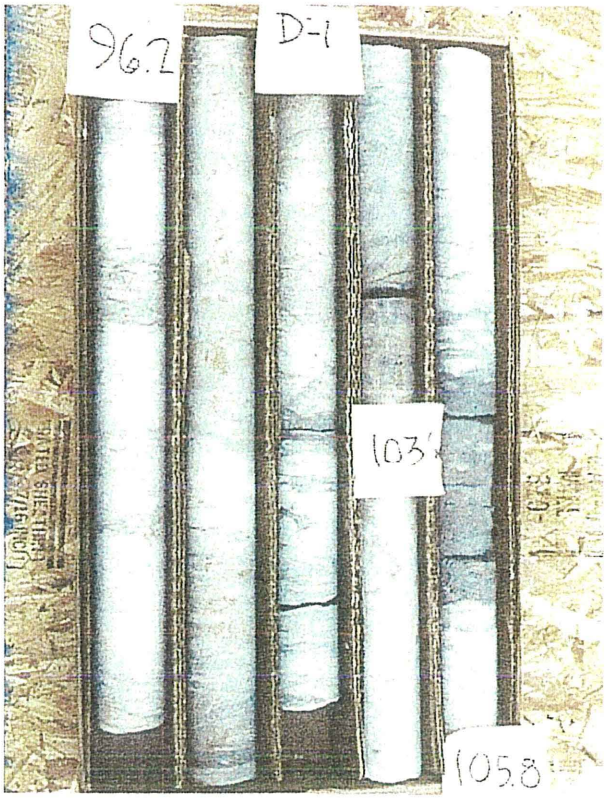

105.8
D-1
112.4
113'
114.6'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103'
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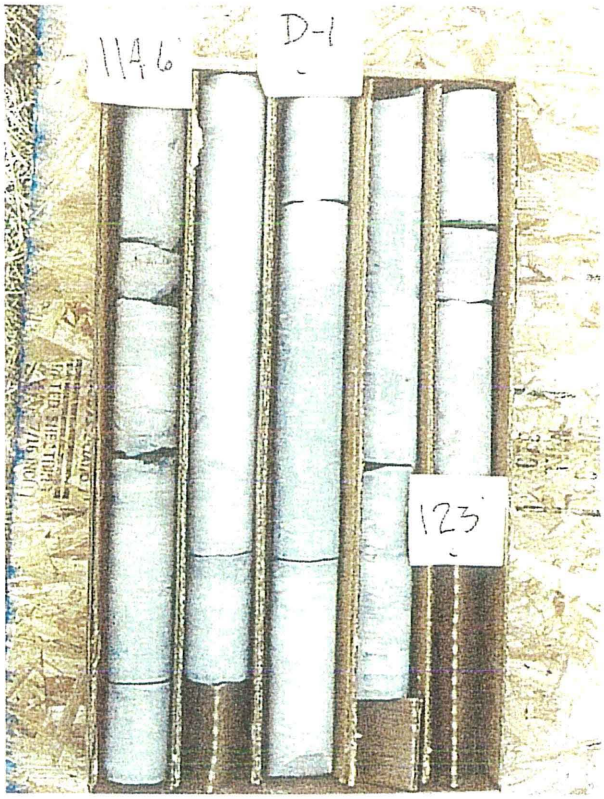
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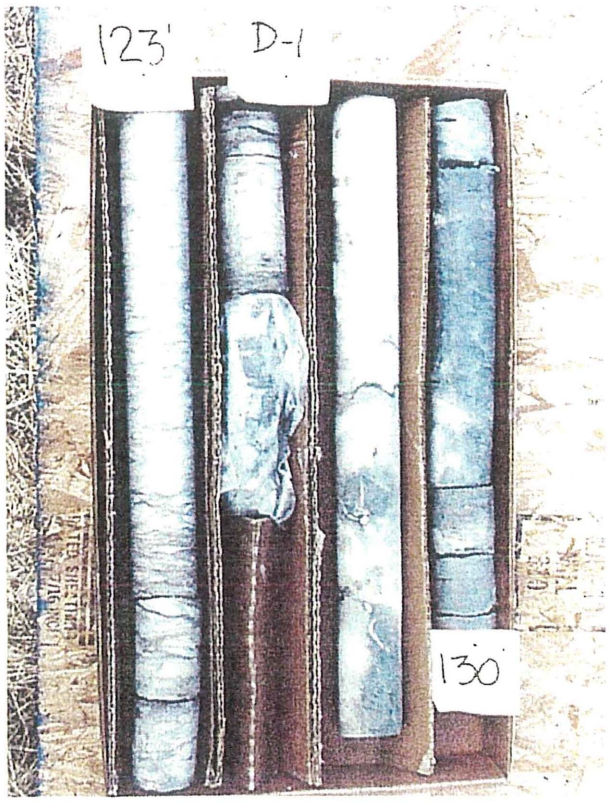
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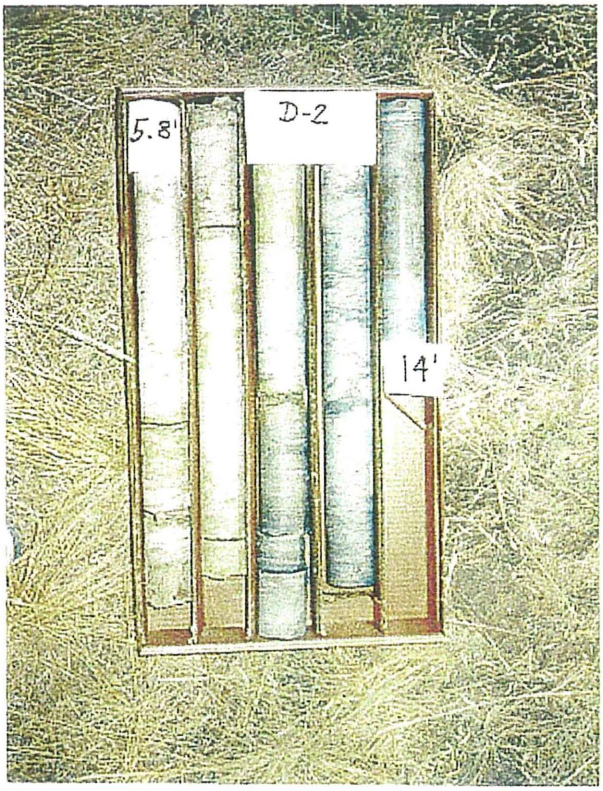

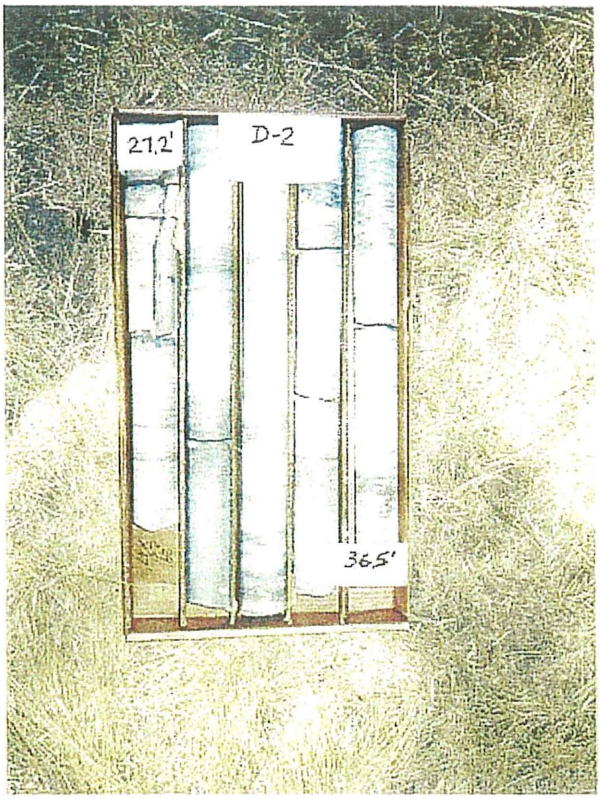

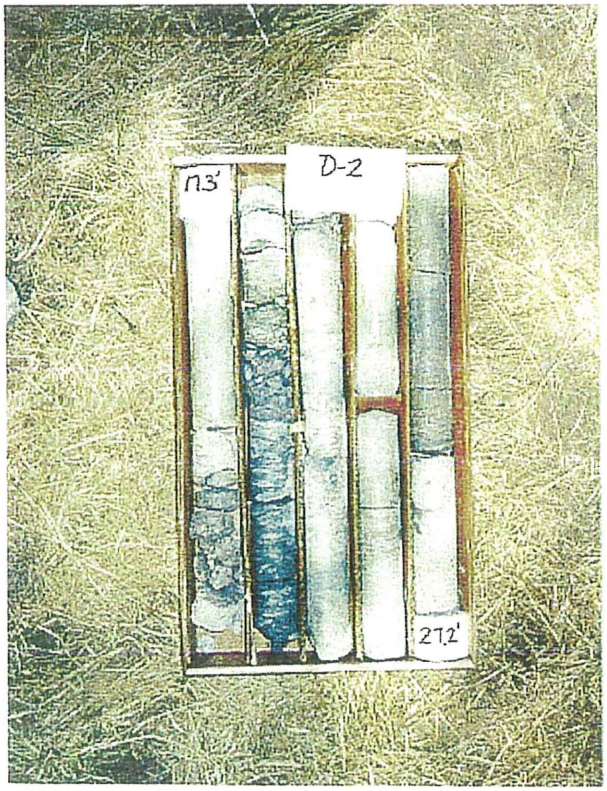

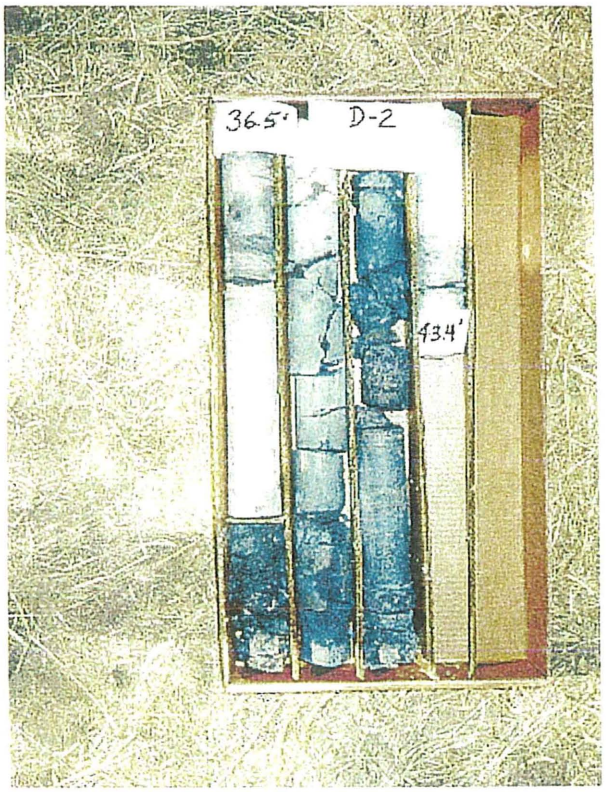

Paluxy River Diversion Project

Boring D-2

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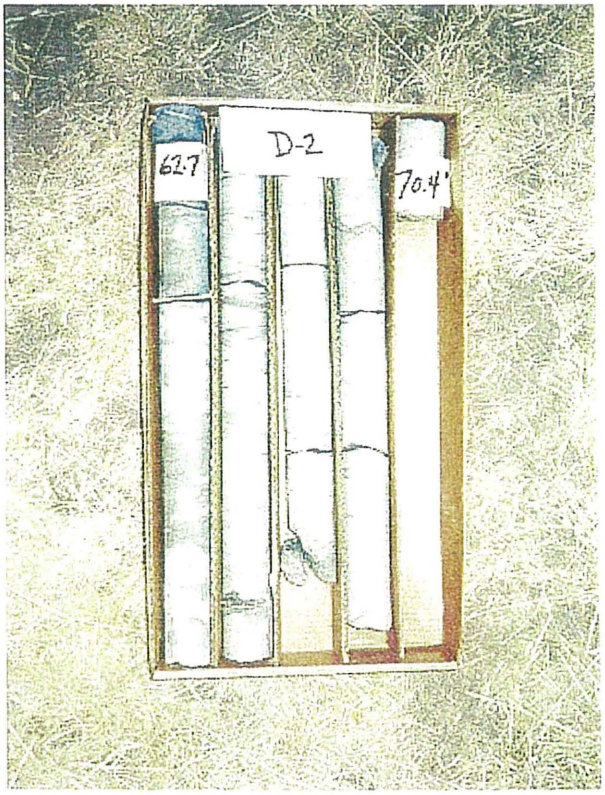
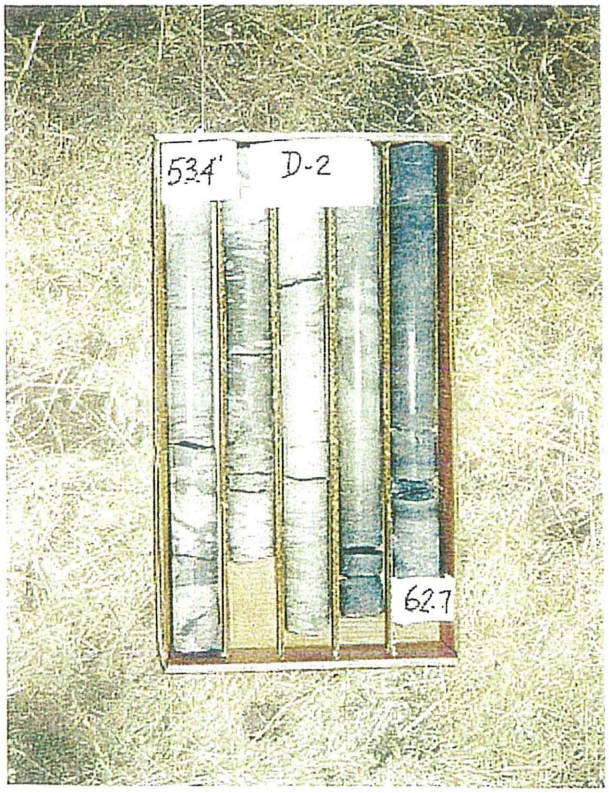
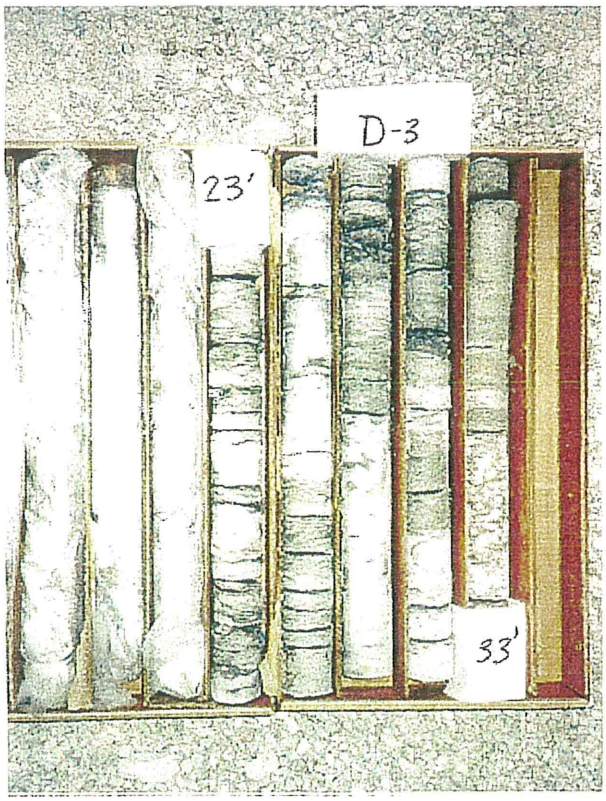


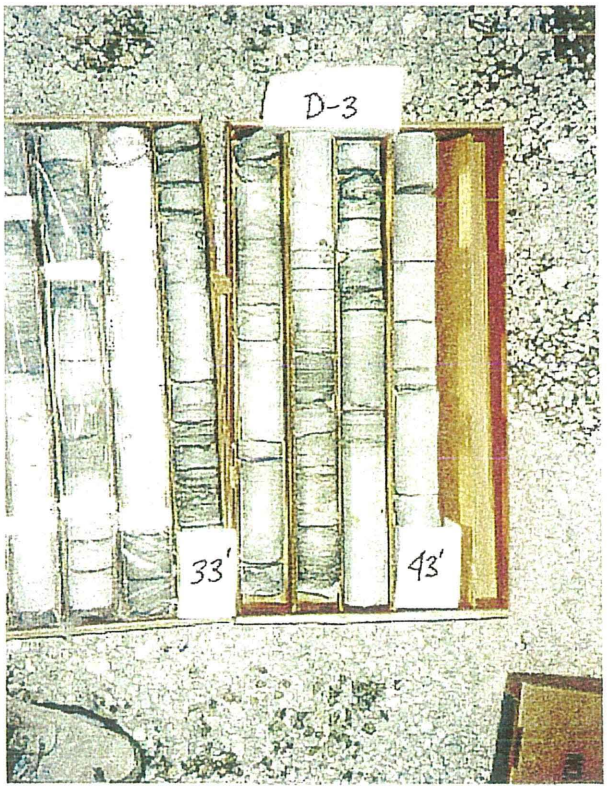


Paluxy River Diversion Basin

Boring D-2

FREESE • NICHOLS

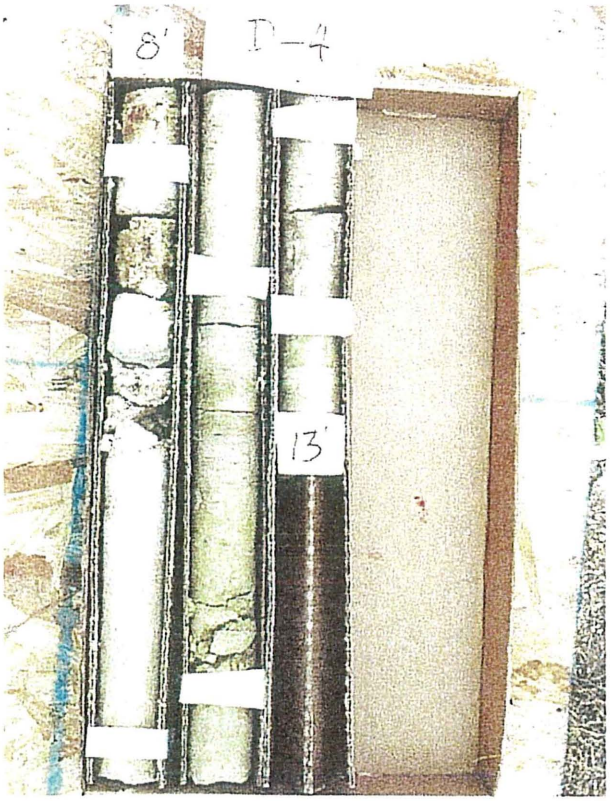


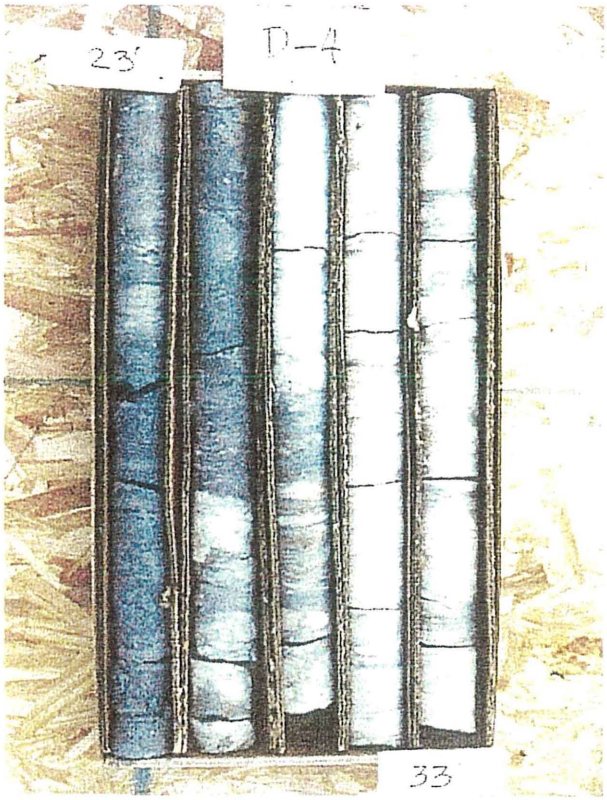


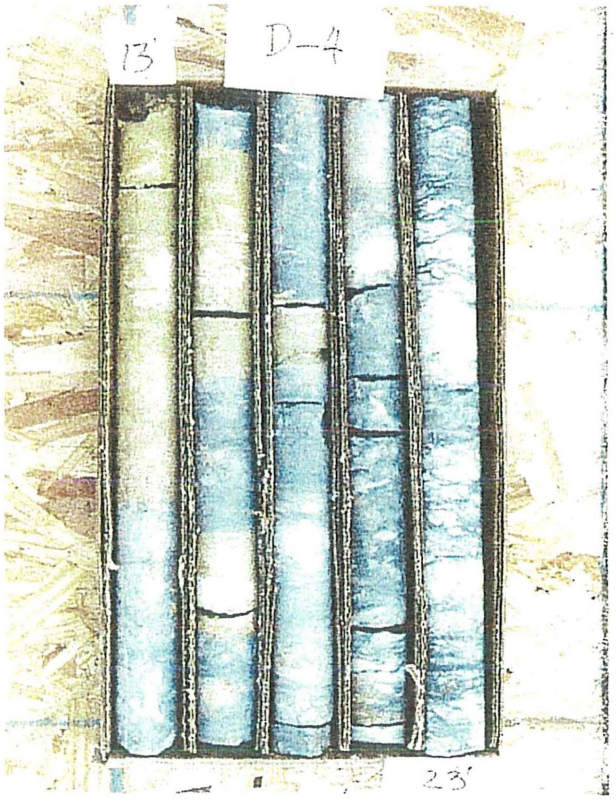
Paluxy River Diversion Project

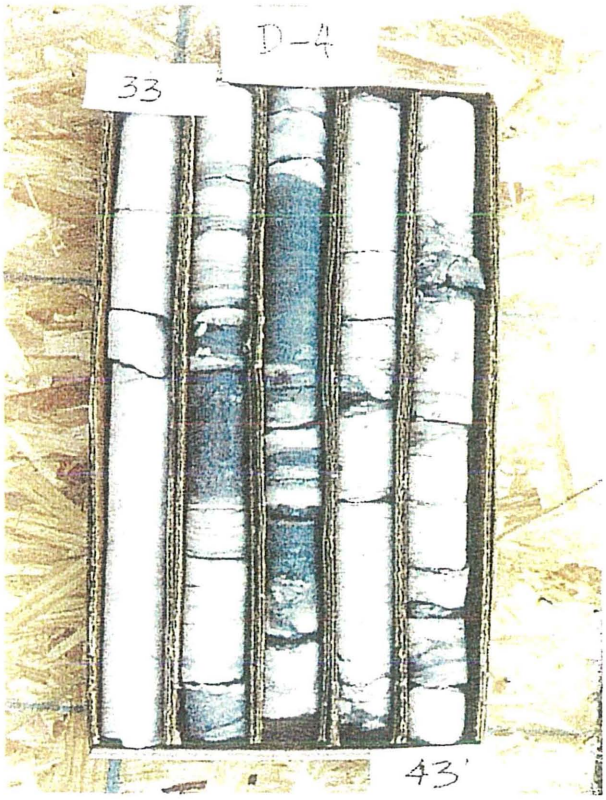
Boring D-3

FREESE • NICHOLS





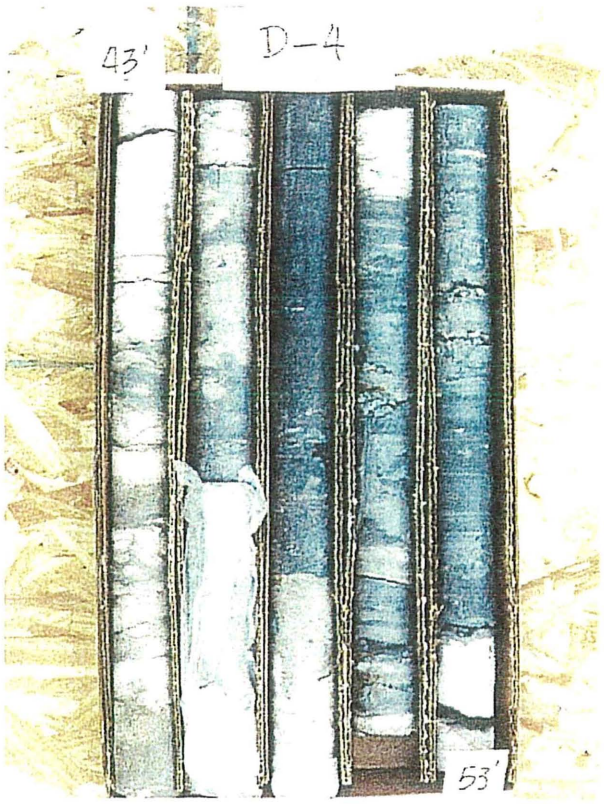


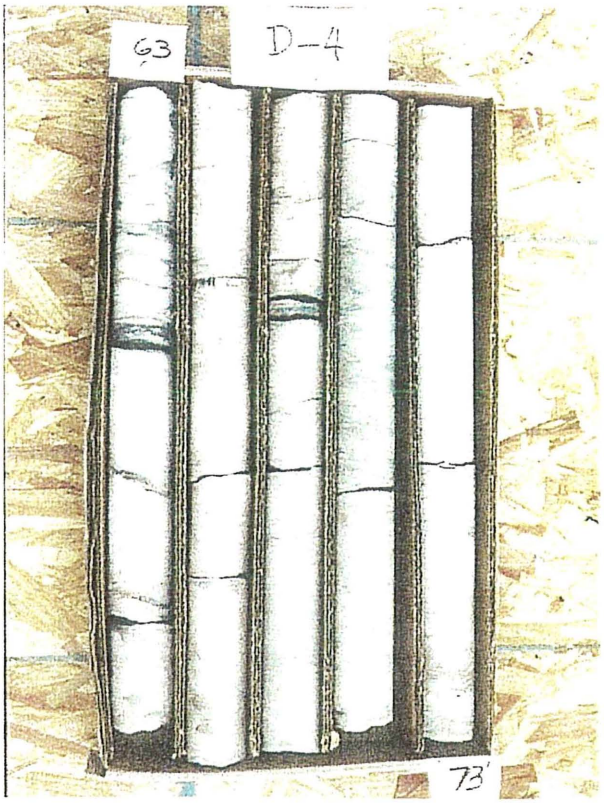


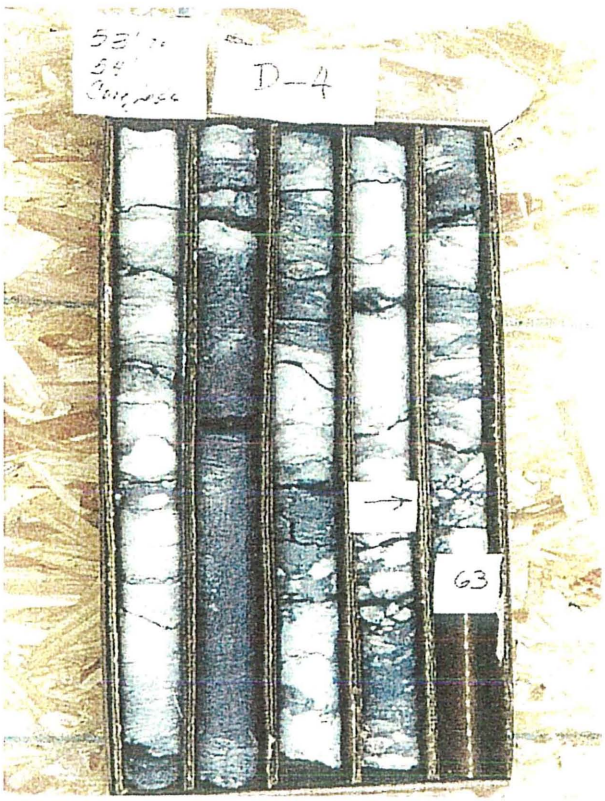
Paluxy River Diversion Project

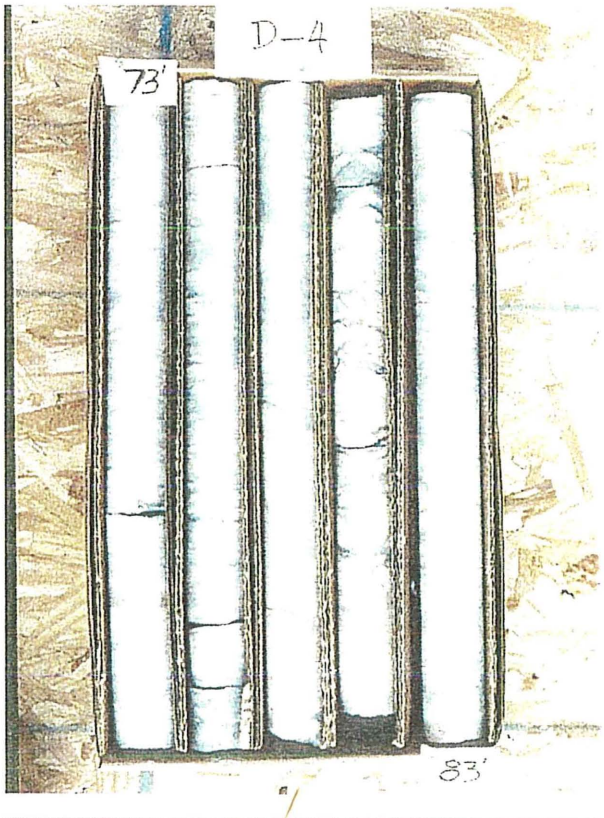
Boring D-4

FREESE • NICHOLS





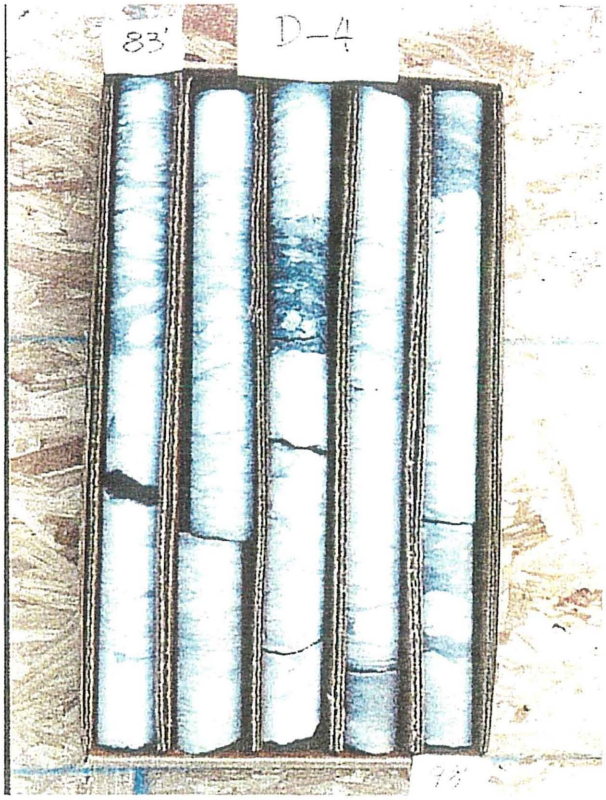




Paluxy River Diversion Project

Boring D-4

FREESE • NICHOLS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D-4
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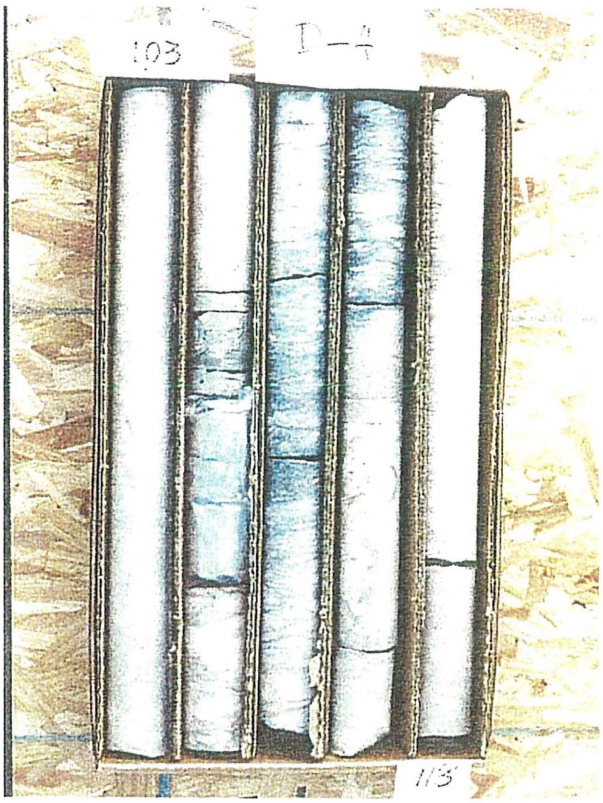
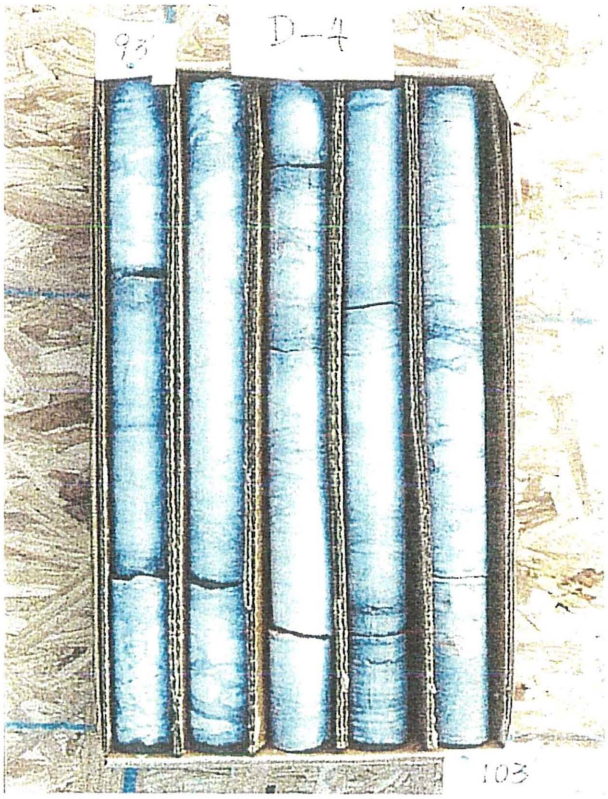

103
D-4
113'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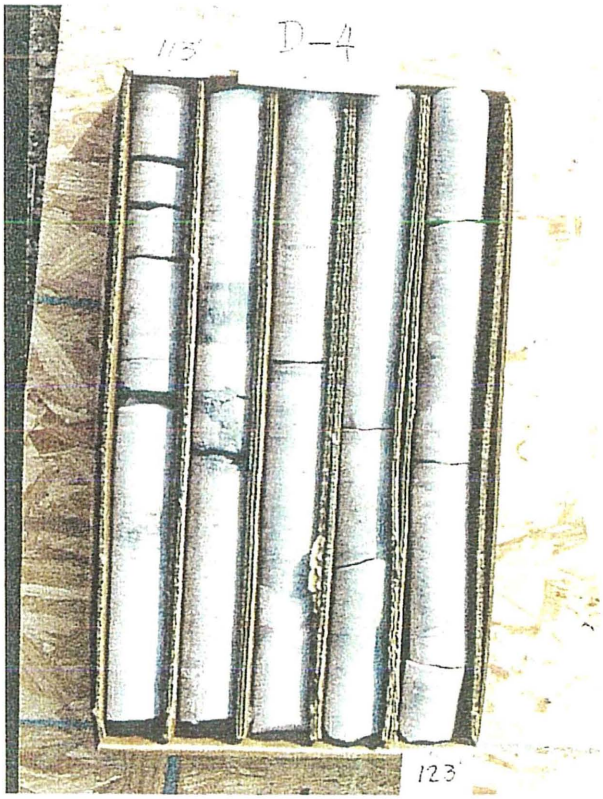
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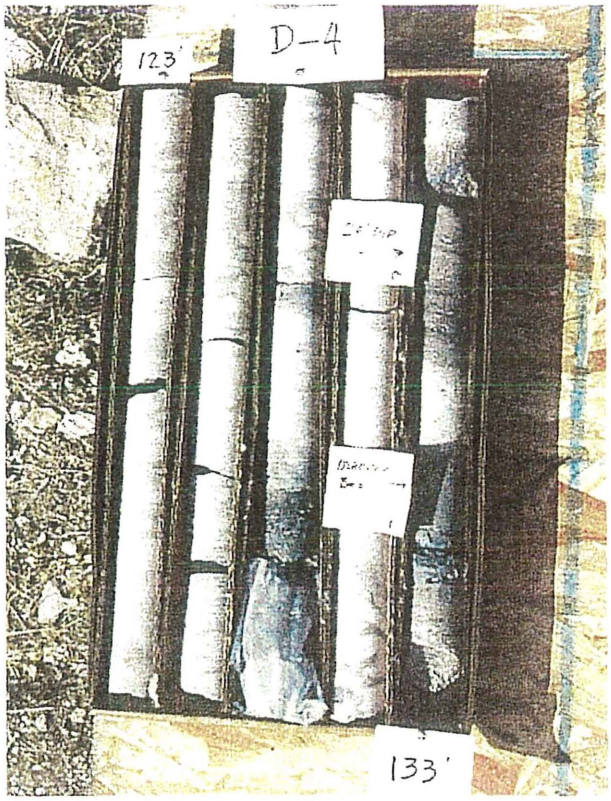
123'
D-4
133'

APPENDIX D

DESIGN STORM ANALYSIS

APPENDIX D

DESIGN STORM ANALYSIS

General

Design storm analyses were performed for both the Wheeler Branch Reservoir Dam and the channel dam on the Paluxy River. A Probable Maximum Flood analysis and a 100-year storm analysis were conducted for the Wheeler Branch watershed, and a 100-year storm analysis was used for the diversion dam on the Paluxy River. A brief discussion of the studies and results is presented in the following sections.

Wheeler Branch Dam

Wheeler Branch Dam is located two miles north of the city of Glen Rose in Somervell County. The drainage area is approximately 1.62 square miles. The relationships among the reservoir elevations, surface area and capacities are shown on Sheet 6 of the permit application drawings in Appendix B and also in Appendix G. The top of the embankment will be at 796 feet msl, which provides 11 feet of freeboard above the top of the conservation pool.

Probable Maximum Precipitation on Wheeler Branch Watershed

The Probable Maximum Precipitation (PMP) values were determined from data given in the Hydrometeorological Reports Nos. 51[9] and 52[10] prepared by the U.S. Weather Bureau. Average value of 48.97 inches over the basin was used for a 72-hour PMP. Assuming saturated conditions with no initial losses and infiltration losses of 0.10 inches, the total rainfall excess for the 72-hour period is 41.80 inches. The PMP rainfall and excess values are given in the HEC-1 output located at the end of this Appendix.

Unit Hydrographs for Wheeler Branch Watershed

A unit hydrograph was developed for the Wheeler Branch watershed using the Snyder method. Snyder's coefficients (C_p and C_t) used in the development of the unit hydrograph were:

$$640C_p = 512$$

$$C_t = 1$$

These values were based on coefficients used in published Corps of Engineers reports and adjusted to reflect the basin conditions of Wheeler Branch. Due to the relatively small drainage area, the peak of the unit inflow hydrograph was lagged only 0.75 hour behind the peak rainfall.

Probable Maximum Flood on Wheelers Branch Watershed

It was assumed that the Wheeler Branch dam would be classified as "high hazard" and was designed to safely pass the Probable Maximum Flood (PMF) on Wheeler Branch. The PMF hydrograph from the Wheelers Branch drainage area, less the area of the lake, was obtained by applying the rainfall excess values to the unit hydrograph. In addition to this inflow, direct precipitation on the lake was included. The peak PMF flow was estimated to be 11,856 cfs from the overland flow and 3,808 cfs from rainfall directly on the 0.27 square mile lake. The combined peak flow was estimated to be 12,454 cfs, with a peak reservoir level of 795.37 feet msl and a peak discharge of 6,544 cfs through the 200-foot wide emergency spillway.

100-Year Flood on Wheelers Branch Watershed

The 100-year flood hydrograph for the Wheelers Branch watershed was obtained by applying the unit hydrograph to a 24-hour rainfall event with a total precipitation of 9.5 inches. The peak flow from the overland runoff was 2,714 cfs and 725 cfs from rainfall directly on the reservoir surface. The combined peak inflow was estimated to be 2,863 cfs, with a peak reservoir elevation of 788 feet msl. This is below the emergency spillway elevation of 790 feet msl. The maximum discharge recorded was 166 cfs through the morning glory spillway.

Diversion Dam

A 100-year rainfall event was analyzed for the Paluxy River upstream of the diversion dam to determine if there is a potential to increase the 100-year flood elevation. The Corps of Engineers has developed hydrographs for the Paluxy for the 100-year storm. Using this data and the Corps of Engineers model HEC-2, the water levels along the channel were estimated both without the diversion dam and with the diversion dam and appropriate channel modifications to eliminate any increases in the flood elevation.

The modifications included lowering an approximate 2-acre area to the south of the diversion dam about 1 to 5 feet to elevation 603 feet msl, which is 5 feet above the normal pool elevation. (See application drawings for proposed area to be re-graded.)

The findings of the HEC-2 study verified that the proposed modifications along the south bank would enable the construction of the diversion dam without any rise in the FEMA 100-year flood levees upstream.

```
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 *              JUN   1998              *
 *            VERSION 4.1               *
 *                                      *
 *  RUN DATE   20MAR01  TIME  10:39:10  *
 *                                      *
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*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
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X     X  XXXXXXX   XXXXX        XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

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

1 HEC-1 INPUT PAGE 1

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

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  3           ID     By: RGW            Name: 2200PMF.IH1
  4           IT      15 28NOV00       0     288
  5           IO       1       2

  6           KK  PRECIP
  7           KM  ***************************PRECIP FROM 28 NOV TO 1 DEC 00********************
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 12           PI   0.031   0.031   0.031   0.031   0.031   0.031   0.031   0.031   0.031   0.031
 13           PI   0.031   0.031   0.031   0.031   0.031   0.031   0.031   0.031   0.039   0.039
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 18           PI   0.054   0.054   0.054   0.054   0.054   0.054   0.077   0.078   0.079   0.079
 19           PI   0.080   0.081   0.082   0.083   0.084   0.085   0.086   0.087   0.088   0.090
 20           PI   0.091   0.092   0.094   0.095   0.097   0.098   0.100   0.102   0.103   0.105
 21           PI   0.175   0.181   0.188   0.194   0.200   0.207   0.213   0.220   0.226   0.233
 22           PI   0.240   0.246   0.253   0.260   0.267   0.273   0.280   0.287   0.294   0.301
 23           PI   0.308   0.315   0.322   0.329   0.350   0.414   0.471   0.519   0.559   0.590
 24           PI   0.670   0.841   0.845   1.018   2.534   5.069   5.464   3.701   1.325   0.858
```

```
          25          PI   0.879   0.771   0.603   0.575   0.540   0.496   0.444   0.383   0.169   0.165
          26          PI   0.160   0.156   0.152   0.148   0.144   0.141   0.137   0.134   0.131   0.128
          27          PI   0.125   0.123   0.120   0.118   0.116   0.114   0.112   0.111   0.109   0.108
          28          PI   0.107   0.106   0.068   0.068   0.068   0.068   0.068   0.068   0.068   0.068
          29          PI   0.068   0.068   0.068   0.068   0.068   0.068   0.068   0.068   0.068   0.068
          30          PI   0.068   0.068   0.068   0.068   0.068   0.068   0.046   0.046   0.046   0.046
          31          PI   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046
          32          PI   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046   0.046
          33          PI   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034
          34          PI   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034   0.034
          35          PI   0.034   0.034   0.034   0.034   0.028   0.028   0.028   0.028   0.028   0.028
          36          PI   0.028   0.028   0.028   0.028   0.028   0.028   0.028   0.028   0.028   0.028
          37          PI   0.028   0.028   0.028   0.028   0.028   0.028   0.028   0.028
          38          US     0.9     0.8
          39          LU       0     0.1

          40          KK  LAKE
          41          BA    0.27
          42          UI     697
          43          LU       0       0

          44          KK  INFLOW
          45          HC       2

          46          KK  IN-FNI
          47          RS       1    ELEV     785
          48          SV    4118    4289    4464    4643    4826    5013    5205    5402    5605    5814
          49          SV    6028    6248    5474    6707    6946    7190
          50          SE     785     786     787     788     789     790     791     792     793     794
          51          SE     795     796     797     798     799     800
1                                                HEC-1 INPUT                                          PAGE  2

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

          52          SQ       0      96     136     166     192     215     735    1668    2870    4288
          53          SQ    5894    7667    9593   11660   13859   16183
          54          ZZ
1****************************************                                    ****************************************
 *                                      *                                    *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998              *                                    *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                *                                    *          609 SECOND STREET           *
 *                                      *                                    *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   20MAR01  TIME  10:39:10  *                                    *           (916) 756-1104             *
 *                                      *                                    *                                      *
 ****************************************                                    ****************************************


                         Model Rainfall runoff inflow into Wheeler Branch
                         FNI SOM00166        Date:03 -19-01
                         By: RGW            Name: 2200PMF.IH1

   5 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           1  PRINT CONTROL
                       IPLOT           2  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN          15  MINUTES IN COMPUTATION INTERVAL
                       IDATE     28NOV 0  STARTING DATE
```

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                ITIME        0000  STARTING TIME
                   NQ         288  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE     30NOV 0  ENDING DATE
              NDTIME        2345  ENDING TIME
              ICENT           19  CENTURY MARK

          COMPUTATION INTERVAL     .25 HOURS
               TOTAL TIME BASE   71.75 HOURS

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


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


          **************
          *            *
  6 KK    *    PRECIP  *
          *            *
          **************
                    ***************************PRECIP FROM 28 NOV TO 1 DEC 00*********************

             SUBBASIN RUNOFF DATA

  8 BA          SUBBASIN CHARACTERISTICS
                     TAREA        1.35  SUBBASIN AREA

                PRECIPITATION DATA

  7 PB                STORM       48.97  BASIN TOTAL PRECIPITATION

  7 PI            INCREMENTAL PRECIPITATION PATTERN
                      .03       .03       .03       .02       .02       .03       .03       .03       .03       .03
                      .03       .03       .03       .03       .03       .03       .03       .03       .03       .02
                      .02       .02       .02       .02       .03       .03       .03       .03       .03       .03
                      .03       .03       .03       .03       .03       .03       .03       .03       .03       .03
                      .03       .03       .03       .03       .03       .03       .03       .03       .04       .04
                      .04       .04       .04       .04       .04       .04       .04       .04       .04       .04
                      .04       .04       .04       .04       .04       .04       .04       .04       .04       .04
                      .04       .04       .05       .05       .05       .05       .05       .05       .05       .05
                      .05       .05       .05       .05       .05       .05       .05       .05       .05       .05
                      .05       .05       .05       .05       .05       .05       .08       .08       .08       .08
                      .08       .08       .08       .08       .08       .09       .09       .09       .09       .09
                      .09       .09       .09       .09       .10       .10       .10       .10       .10       .11
                      .18       .18       .19       .19       .20       .21       .21       .22       .23       .23
                      .24       .25       .25       .26       .27       .27       .28       .29       .29       .30
                      .31       .31       .32       .33       .35       .41       .47       .52       .56       .59
                      .67       .84       .84      1.02      2.53      5.07      5.46      3.70      1.33       .86
                      .88       .77       .60       .58       .54       .50       .44       .38       .17       .17
                      .16       .16       .15       .15       .14       .14       .14       .13       .13       .13
                      .13       .12       .12       .12       .12       .11       .11       .11       .11       .11
                      .11       .11       .07       .07       .07       .07       .07       .07       .07       .07
                      .07       .07       .07       .07       .07       .07       .07       .07       .07       .07
                      .07       .07       .07       .07       .07       .07       .05       .05       .05       .05
                      .05       .05       .05       .05       .05       .05       .05       .05       .05       .05
```

.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03			

```
39 LU          UNIFORM LOSS RATE
                    STRTL        .00  INITIAL LOSS
                    CNSTL        .10  UNIFORM LOSS RATE
                    RTIMP        .00  PERCENT IMPERVIOUS AREA

38 US          SNYDER UNITGRAPH
                       TP        .90  LAG
                       CP        .80  PEAKING COEFFICIENT

               SYNTHETIC ACCUMULATED-AREA VS  TIME CURVE WILL BE USED

                                                   ***
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 1.19 AND R=  .43 INTERVALS

                                          UNIT HYDROGRAPH PARAMETERS
                                     CLARK   TC=  1.19 HR,       R=   .43 HR
                                    SNYDER   TP=   .89 HR,      CP=   .79

                                          UNIT HYDROGRAPH
                                     12 END-OF-PERIOD ORDINATES
          106.      358.      623.      753.      666.      439.      242.      133.       74.       41.
           22.       12.
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HYDROGRAPH AT STATION PRECIP

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DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	*	DA	MON	HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
28	NOV	0000	1	.00	.00	.00	0.	*	29	NOV	1200	145	.33	.03	.30	968.
28	NOV	0015	2	.03	.03	.00	0.	*	29	NOV	1215	146	.35	.03	.33	994.
28	NOV	0030	3	.03	.03	.00	0.	*	29	NOV	1230	147	.41	.03	.39	1029.
28	NOV	0045	4	.03	.03	.00	0.	*	29	NOV	1245	148	.47	.03	.45	1088.
28	NOV	0100	5	.02	.02	.00	0.	*	29	NOV	1300	149	.52	.03	.49	1180.
28	NOV	0115	6	.02	.02	.00	0.	*	29	NOV	1315	150	.56	.02	.53	1306.
28	NOV	0130	7	.03	.03	.00	0.	*	29	NOV	1330	151	.59	.02	.57	1452.
28	NOV	0145	8	.03	.03	.00	0.	*	29	NOV	1345	152	.67	.02	.65	1606.
28	NOV	0200	9	.03	.03	.00	0.	*	29	NOV	1400	153	.84	.02	.82	1778.
28	NOV	0215	10	.03	.03	.00	0.	*	29	NOV	1415	154	.84	.02	.82	1985.
28	NOV	0230	11	.03	.03	.00	0.	*	29	NOV	1430	155	1.02	.02	.99	2235.
28	NOV	0245	12	.03	.03	.00	0.	*	29	NOV	1445	156	2.53	.03	2.51	2680.
28	NOV	0300	13	.03	.03	.00	0.	*	29	NOV	1500	157	5.07	.03	5.04	3772.
28	NOV	0315	14	.03	.03	.00	0.	*	29	NOV	1515	158	5.46	.03	5.44	5904.
28	NOV	0330	15	.03	.03	.00	0.	*	29	NOV	1530	159	3.70	.03	3.68	8755.
28	NOV	0345	16	.03	.03	.00	0.	*	29	NOV	1545	160	1.33	.02	1.30	11145.
28	NOV	0400	17	.03	.03	.00	0.	*	29	NOV	1600	161	.86	.02	.83	11856.
28	NOV	0415	18	.03	.03	.00	0.	*	29	NOV	1615	162	.88	.02	.85	10659.
28	NOV	0430	19	.03	.03	.00	0.	*	29	NOV	1630	163	.77	.02	.75	8408.
28	NOV	0445	20	.03	.03	.00	0.	*	29	NOV	1645	164	.60	.02	.58	6211.
28	NOV	0500	21	.02	.02	.00	0.	*	29	NOV	1700	165	.58	.02	.55	4619.
28	NOV	0515	22	.02	.02	.00	0.	*	29	NOV	1715	166	.54	.02	.52	3586.
28	NOV	0530	23	.02	.02	.00	0.	*	29	NOV	1730	167	.50	.03	.47	2894.
28	NOV	0545	24	.02	.02	.00	0.	*	29	NOV	1745	168	.44	.03	.42	2407.
28	NOV	0600	25	.02	.02	.00	0.	*	29	NOV	1800	169	.38	.03	.36	2047.

28 NOV 0615	26	.03	.03	.01	1.	*	29 NOV 1815	170	.17	.03	.14	1754.
28 NOV 0630	27	.03	.03	.01	3.	*	29 NOV 1830	171	.17	.03	.14	1479.
28 NOV 0645	28	.03	.03	.01	7.	*	29 NOV 1845	172	.16	.03	.13	1210.
28 NOV 0700	29	.03	.03	.01	11.	*	29 NOV 1900	173	.16	.03	.13	954.
28 NOV 0715	30	.03	.03	.01	15.	*	29 NOV 1915	174	.15	.03	.13	750.
28 NOV 0730	31	.03	.03	.01	18.	*	29 NOV 1930	175	.15	.02	.12	616.
28 NOV 0745	32	.03	.03	.01	19.	*	29 NOV 1945	176	.14	.02	.12	537.
28 NOV 0800	33	.03	.03	.01	20.	*	29 NOV 2000	177	.14	.02	.12	487.
28 NOV 0815	34	.03	.03	.01	20.	*	29 NOV 2015	178	.14	.02	.11	454.
28 NOV 0830	35	.03	.03	.01	21.	*	29 NOV 2030	179	.13	.02	.11	430.
28 NOV 0845	36	.03	.03	.01	21.	*	29 NOV 2045	180	.13	.02	.11	412.
28 NOV 0900	37	.03	.03	.01	21.	*	29 NOV 2100	181	.13	.02	.10	397.
28 NOV 0915	38	.03	.03	.01	21.	*	29 NOV 2115	182	.13	.02	.10	386.
28 NOV 0930	39	.03	.03	.01	21.	*	29 NOV 2130	183	.12	.02	.10	375.
28 NOV 0945	40	.03	.03	.01	21.	*	29 NOV 2145	184	.12	.02	.09	364.
28 NOV 1000	41	.03	.03	.01	21.	*	29 NOV 2200	185	.12	.02	.09	354.
28 NOV 1015	42	.03	.03	.01	21.	*	29 NOV 2215	186	.12	.02	.09	345.
28 NOV 1030	43	.03	.03	.01	21.	*	29 NOV 2230	187	.11	.02	.09	336.
28 NOV 1045	44	.03	.03	.01	21.	*	29 NOV 2245	188	.11	.02	.09	328.
28 NOV 1100	45	.03	.03	.01	21.	*	29 NOV 2300	189	.11	.02	.09	321.
28 NOV 1115	46	.03	.03	.01	21.	*	29 NOV 2315	190	.11	.02	.08	314.
28 NOV 1130	47	.03	.03	.01	21.	*	29 NOV 2330	191	.11	.02	.08	307.
28 NOV 1145	48	.03	.03	.01	21.	*	29 NOV 2345	192	.11	.02	.08	301.
28 NOV 1200	49	.03	.03	.01	21.	*	30 NOV 0000	193	.11	.02	.08	296.
28 NOV 1215	50	.04	.03	.01	22.	*	30 NOV 0015	194	.07	.02	.04	288.
28 NOV 1230	51	.04	.03	.01	25.	*	30 NOV 0030	195	.07	.02	.04	270.
28 NOV 1245	52	.04	.03	.01	30.	*	30 NOV 0045	196	.07	.02	.04	244.
28 NOV 1300	53	.04	.03	.01	36.	*	30 NOV 0100	197	.07	.02	.04	213.
28 NOV 1315	54	.04	.03	.01	41.	*	30 NOV 0115	198	.07	.02	.04	187.
28 NOV 1330	55	.04	.03	.01	44.	*	30 NOV 0130	199	.07	.02	.04	170.
28 NOV 1345	56	.04	.03	.01	46.	*	30 NOV 0145	200	.07	.02	.04	160.
28 NOV 1400	57	.04	.03	.01	47.	*	30 NOV 0200	201	.07	.02	.04	155.
28 NOV 1415	58	.04	.03	.01	48.	*	30 NOV 0215	202	.07	.02	.04	152.
28 NOV 1430	59	.04	.03	.01	48.	*	30 NOV 0230	203	.07	.02	.04	151.
28 NOV 1445	60	.04	.03	.01	48.	*	30 NOV 0245	204	.07	.02	.04	150.
28 NOV 1500	61	.04	.03	.01	49.	*	30 NOV 0300	205	.07	.02	.04	149.
28 NOV 1515	62	.04	.03	.01	49.	*	30 NOV 0315	206	.07	.02	.04	149.
28 NOV 1530	63	.04	.03	.01	49.	*	30 NOV 0330	207	.07	.02	.04	149.
28 NOV 1545	64	.04	.03	.01	49.	*	30 NOV 0345	208	.07	.02	.04	149.
28 NOV 1600	65	.04	.03	.01	49.	*	30 NOV 0400	209	.07	.02	.04	149.
28 NOV 1615	66	.04	.03	.01	49.	*	30 NOV 0415	210	.07	.02	.04	149.
28 NOV 1630	67	.04	.03	.01	49.	*	30 NOV 0430	211	.07	.02	.04	149.
28 NOV 1645	68	.04	.03	.01	49.	*	30 NOV 0445	212	.07	.02	.04	149.
28 NOV 1700	69	.04	.03	.01	49.	*	30 NOV 0500	213	.07	.02	.04	149.
28 NOV 1715	70	.04	.03	.01	49.	*	30 NOV 0515	214	.07	.02	.04	149.
28 NOV 1730	71	.04	.03	.01	49.	*	30 NOV 0530	215	.07	.02	.04	149.
28 NOV 1745	72	.04	.03	.01	49.	*	30 NOV 0545	216	.07	.02	.04	149.
28 NOV 1800	73	.04	.03	.01	49.	*	30 NOV 0600	217	.07	.02	.04	149.
28 NOV 1815	74	.05	.03	.03	50.	*	30 NOV 0615	218	.05	.03	.02	147.
28 NOV 1830	75	.05	.03	.03	56.	*	30 NOV 0630	219	.05	.03	.02	139.
28 NOV 1845	76	.05	.03	.03	65.	*	30 NOV 0645	220	.05	.03	.02	125.
28 NOV 1900	77	.05	.03	.03	76.	*	30 NOV 0700	221	.05	.03	.02	109.
28 NOV 1915	78	.05	.03	.03	86.	*	30 NOV 0715	222	.05	.03	.02	94.
28 NOV 1930	79	.05	.03	.03	93.	*	30 NOV 0730	223	.05	.03	.02	84.
28 NOV 1945	80	.05	.03	.03	96.	*	30 NOV 0745	224	.05	.03	.02	79.
28 NOV 2000	81	.05	.03	.03	98.	*	30 NOV 0800	225	.05	.03	.02	76.
28 NOV 2015	82	.05	.03	.03	99.	*	30 NOV 0815	226	.05	.03	.02	75.
28 NOV 2030	83	.05	.03	.03	100.	*	30 NOV 0830	227	.05	.03	.02	74.
28 NOV 2045	84	.05	.03	.03	100.	*	30 NOV 0845	228	.05	.03	.02	73.
28 NOV 2100	85	.05	.03	.03	101.	*	30 NOV 0900	229	.05	.03	.02	73.
28 NOV 2115	86	.05	.03	.03	101.	*	30 NOV 0915	230	.05	.03	.02	73.
28 NOV 2130	87	.05	.03	.03	101.	*	30 NOV 0930	231	.05	.03	.02	73.
28 NOV 2145	88	.05	.03	.03	101.	*	30 NOV 0945	232	.05	.03	.02	73.

28 NOV 2200	89	.05	.03	.03	101.	*	30 NOV 1000	233	.05	.03	.02	73.
28 NOV 2215	90	.05	.03	.03	101.	*	30 NOV 1015	234	.05	.03	.02	73.
28 NOV 2230	91	.05	.03	.03	101.	*	30 NOV 1030	235	.05	.03	.02	73.
28 NOV 2245	92	.05	.03	.03	101.	*	30 NOV 1045	236	.05	.03	.02	73.
28 NOV 2300	93	.05	.03	.03	101.	*	30 NOV 1100	237	.05	.03	.02	73.
28 NOV 2315	94	.05	.03	.03	101.	*	30 NOV 1115	238	.05	.03	.02	73.
28 NOV 2330	95	.05	.03	.03	101.	*	30 NOV 1130	239	.05	.03	.02	73.
28 NOV 2345	96	.05	.03	.03	101.	*	30 NOV 1145	240	.05	.03	.02	73.
29 NOV 0000	97	.05	.03	.03	101.	*	30 NOV 1200	241	.05	.03	.02	73.
29 NOV 0015	98	.08	.02	.05	103.	*	30 NOV 1215	242	.03	.03	.01	72.
29 NOV 0030	99	.08	.02	.05	111.	*	30 NOV 1230	243	.03	.03	.01	67.
29 NOV 0045	100	.08	.02	.05	126.	*	30 NOV 1245	244	.03	.03	.01	60.
29 NOV 0100	101	.08	.02	.05	145.	*	30 NOV 1300	245	.03	.03	.01	51.
29 NOV 0115	102	.08	.02	.05	161.	*	30 NOV 1315	246	.03	.03	.01	43.
29 NOV 0130	103	.08	.02	.06	173.	*	30 NOV 1330	247	.03	.03	.01	38.
29 NOV 0145	104	.08	.02	.06	181.	*	30 NOV 1345	248	.03	.03	.01	35.
29 NOV 0200	105	.08	.02	.06	187.	*	30 NOV 1400	249	.03	.03	.01	33.
29 NOV 0215	106	.08	.02	.06	191.	*	30 NOV 1415	250	.03	.03	.01	32.
29 NOV 0230	107	.09	.02	.06	195.	*	30 NOV 1430	251	.03	.03	.01	32.
29 NOV 0245	108	.09	.02	.06	199.	*	30 NOV 1445	252	.03	.03	.01	31.
29 NOV 0300	109	.09	.02	.06	203.	*	30 NOV 1500	253	.03	.03	.01	31.
29 NOV 0315	110	.09	.02	.06	206.	*	30 NOV 1515	254	.03	.03	.01	31.
29 NOV 0330	111	.09	.02	.07	210.	*	30 NOV 1530	255	.03	.03	.01	31.
29 NOV 0345	112	.09	.02	.07	214.	*	30 NOV 1545	256	.03	.03	.01	31.
29 NOV 0400	113	.09	.02	.07	218.	*	30 NOV 1600	257	.03	.03	.01	31.
29 NOV 0415	114	.09	.02	.07	222.	*	30 NOV 1615	258	.03	.03	.01	31.
29 NOV 0430	115	.09	.02	.07	226.	*	30 NOV 1630	259	.03	.03	.01	31.
29 NOV 0445	116	.10	.02	.07	231.	*	30 NOV 1645	260	.03	.03	.01	31.
29 NOV 0500	117	.10	.02	.07	236.	*	30 NOV 1700	261	.03	.03	.01	31.
29 NOV 0515	118	.10	.02	.07	241.	*	30 NOV 1715	262	.03	.03	.01	31.
29 NOV 0530	119	.10	.02	.08	246.	*	30 NOV 1730	263	.03	.03	.01	31.
29 NOV 0545	120	.10	.02	.08	252.	*	30 NOV 1745	264	.03	.03	.01	31.
29 NOV 0600	121	.11	.02	.08	257.	*	30 NOV 1800	265	.03	.03	.01	31.
29 NOV 0615	122	.18	.03	.15	270.	*	30 NOV 1815	266	.03	.03	.00	31.
29 NOV 0630	123	.18	.03	.16	301.	*	30 NOV 1830	267	.03	.03	.00	28.
29 NOV 0645	124	.19	.03	.16	351.	*	30 NOV 1845	268	.03	.03	.00	25.
29 NOV 0700	125	.19	.03	.17	413.	*	30 NOV 1900	269	.03	.03	.00	20.
29 NOV 0715	126	.20	.03	.17	473.	*	30 NOV 1915	270	.03	.03	.00	16.
29 NOV 0730	127	.21	.03	.18	521.	*	30 NOV 1930	271	.03	.03	.00	14.
29 NOV 0745	128	.21	.03	.19	557.	*	30 NOV 1945	272	.03	.03	.00	12.
29 NOV 0800	129	.22	.03	.19	587.	*	30 NOV 2000	273	.03	.03	.00	11.
29 NOV 0815	130	.23	.03	.20	613.	*	30 NOV 2015	274	.03	.03	.00	11.
29 NOV 0830	131	.23	.03	.21	638.	*	30 NOV 2030	275	.03	.03	.00	11.
29 NOV 0845	132	.24	.03	.21	662.	*	30 NOV 2045	276	.03	.03	.00	10.
29 NOV 0900	133	.25	.03	.22	686.	*	30 NOV 2100	277	.03	.03	.00	10.
29 NOV 0915	134	.25	.03	.23	708.	*	30 NOV 2115	278	.03	.03	.00	10.
29 NOV 0930	135	.26	.03	.24	732.	*	30 NOV 2130	279	.03	.03	.00	10.
29 NOV 0945	136	.27	.03	.24	755.	*	30 NOV 2145	280	.03	.03	.00	10.
29 NOV 1000	137	.27	.03	.25	778.	*	30 NOV 2200	281	.03	.03	.00	10.
29 NOV 1015	138	.28	.03	.25	801.	*	30 NOV 2215	282	.03	.03	.00	10.
29 NOV 1030	139	.29	.03	.26	825.	*	30 NOV 2230	283	.03	.03	.00	10.
29 NOV 1045	140	.29	.03	.27	848.	*	30 NOV 2245	284	.03	.03	.00	10.
29 NOV 1100	141	.30	.03	.28	872.	*	30 NOV 2300	285	.03	.03	.00	10.
29 NOV 1115	142	.31	.03	.28	896.	*	30 NOV 2315	286	.03	.03	.00	10.
29 NOV 1130	143	.31	.03	.29	920.	*	30 NOV 2330	287	.03	.03	.00	10.
29 NOV 1145	144	.32	.03	.30	944.	*	30 NOV 2345	288	.03	.03	.00	10.
						*						

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TOTAL RAINFALL = 40.97, TOTAL LOSS = 7.18, TOTAL EXCESS = 41.80

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	71.75-HR

```
+    (CFS)        (HR)
                              (CFS)
+    11856.       40.00                 4203.       1401.        505.         505.
                             (INCHES)  28.945      38.599      41.605       41.605
                             (AC-FT)    2084.       2779.       2996.        2996.

                             CUMULATIVE AREA =     1 35 SQ MI

1                                                        STATION    PRECIP

                              (O) OUTFLOW
          0.       2000.     4000.      6000.      8000.     10000.     12000.        0.        0.        0.        0.        0.        0.
                                                                                                            (L) PRECIP,   (X) EXCESS
          0.          0.        0.         0.         0.         0.         0.        0.        0.        6.        4.        2.        0.
DAHRMN PER
280000   10---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
280015   20         .         .         .         .         .         .         .         .         .         .         .         .
280030   30         .         .         .         .         .         .         .         .         .         .         .         .
280045   40         .         .         .         .         .         .         .         .         .         .         .         .
280100   50         .         .         .         .         .         .         .         .         .         .         .         .
280115   60         .         .         .         .         .         .         .         .         .         .         .         .
280130   70         .         .         .         .         .         .         .         .         .         .         .         .
280145   80         .         .         .         .         .         .         .         .         .         .         .         .
280200   90         .         .         .         .         .         .         .         .         .         .         .         .
280215  100         .         .         .         .         .         .         .         .         .         .         .         .
280230  110 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
280245  120         .         .         .         .         .         .         .         .         .         .         .         .
280300  130         .         .         .         .         .         .         .         .         .         .         .         .
280315  140         .         .         .         .         .         .         .         .         .         .         .         .
280330  150         .         .         .         .         .         .         .         .         .         .         .         .
280345  160         .         .         .         .         .         .         .         .         .         .         .         .
280400  170         .         .         .         .         .         .         .         .         .         .         .         .
280415  180         .         .         .         .         .         .         .         .         .         .         .         .
280430  190         .         .         .         .         .         .         .         .         .         .         .         .
280445  200         .         .         .         .         .         .         .         .         .         .         .         .
280500  210 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
280515  220         .         .         .         .         .         .         .         .         .         .         .         .
280530  230         .         .         .         .         .         .         .         .         .         .         .         .
280545  240         .         .         .         .         .         .         .         .         .         .         .         .
280600  250         .         .         .         .         .         .         .         .         .         .         .         .
280615  260         .         .         .         .         .         .         .         .         .         .         .         .
280630  270         .         .         .         .         .         .         .         .         .         .         .         .
280645  280         .         .         .         .         .         .         .         .         .         .         .         .
280700  290         .         .         .         .         .         .         .         .         .         .         .         .
280715  300         .         .         .         .         .         .         .         .         .         .         .         .
280730  310 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
280745  320         .         .         .         .         .         .         .         .         .         .         .         .
280800  330         .         .         .         .         .         .         .         .         .         .         .         .
280815  340         .         .         .         .         .         .         .         .         .         .         .         .
280830  350         .         .         .         .         .         .         .         .         .         .         .         .
280845  360         .         .         .         .         .         .         .         .         .         .         .         .
280900  370         .         .         .         .         .         .         .         .         .         .         .         .
280915  380         .         .         .         .         .         .         .         .         .         .         .         .
280930  390         .         .         .         .         .         .         .         .         .         .         .         .
280945  400         .         .         .         .         .         .         .         .         .         .         .         .
281000  410 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
281015  420         .         .         .         .         .         .         .         .         .         .         .         .
281030  430         .         .         .         .         .         .         .         .         .         .         .         .
281045  440         .         .         .         .         .         .         .         .         .         .         .         .
281100  450         .         .         .         .         .         .         .         .         .         .         .         .
281115  460         .         .         .         .         .         .         .         .         .         .         .         .
281130  470         .         .         .         .         .         .         .         .         .         .         .         .
281145  480         .         .         .         .         .         .         .         .         .         .         .         .
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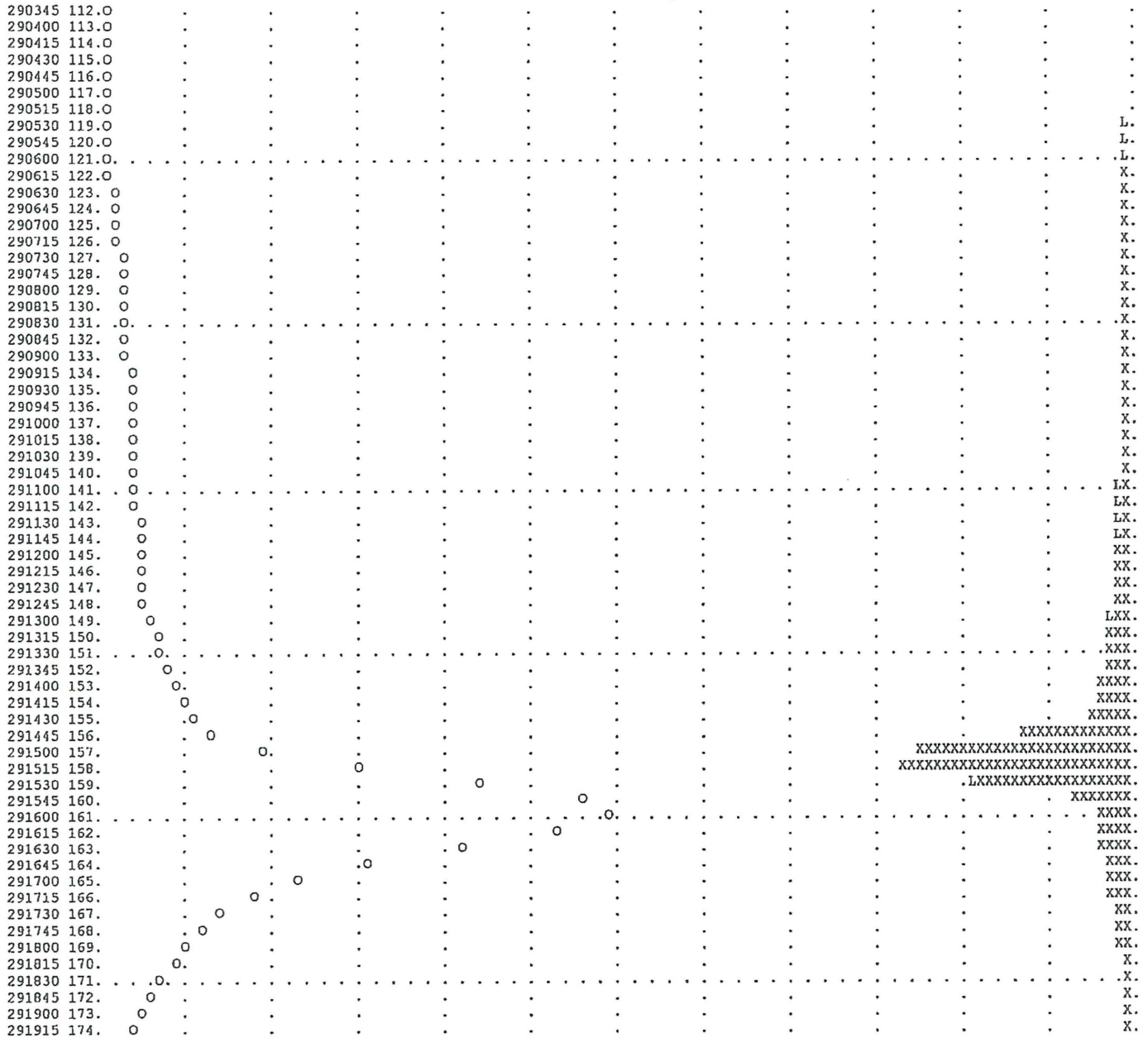
281200 490
281215 500
281230 510
281245 520
281300 530
281315 540
281330 550
281345 560
281400 570
281415 580
281430 590
281445 600
281500 610
281515 620
281530 630
281545 640
281600 650
281615 660
281630 670
281645 680
281700 690
281715 700
281730 710
281745 720
281800 730
281815 740
281830 750
281845 760
281900 770
281915 780
281930 790
281945 800
282000 810
282015 820
282030 83.0
282045 84.0
282100 85.0
282115 86.0
282130 87.0
282145 88.0
282200 89.0
282215 90.0
282230 91.0
282245 92.0
282300 93.0
282315 94.0
282330 95.0
282345 96.0
290000 97.0
290015 98.0
290030 99.0
290045 100.0
290100 101.0
290115 102.0
290130 103.0
290145 104.0
290200 105.0
290215 106.0
290230 107.0
290245 108.0
290300 109.0
290315 110.0
290330 111.0


290345 112.
290400 113.
290415 114.
290430 115.
290445 116.
290500 117.
290515 118.
290530 119.
290545 120.
290600 121.
290615 122.
290630 123.
290645 124.
290700 125.
290715 126.
290730 127.
290745 128.
290800 129.
290815 130.
290830 131.
290845 132.
290900 133.
290915 134.
290930 135.
290945 136.
291000 137.
291015 138.
291030 139.
291045 140.
291100 141.
291115 142.
291130 143.
291145 144.
291200 145.
291215 146.
291230 147.
291245 148.
291300 149.
291315 150.
291330 151.
291345 152.
291400 153.
291415 154.
291430 155.
291445 156.
291500 157.
291515 158.
291530 159.
291545 160.
291600 161.
291615 162.
291630 163.
291645 164.
291700 165.
291715 166.
291730 167.
291745 168.
291800 169.
291815 170.
291830 171.
291845 172.
291900 173.
291915 174.

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291930 175.  O      .       .       .       .       .       .       .       .       .       .       X.
291945 176.  O      .       .       .       .       .       .       .       .       .       .       X.
292000 177. O       .       .       .       .       .       .       .       .       .       .       X.
292015 178. O       .       .       .       .       .       .       .       .       .       .       X.
292030 179. O       .       .       .       .       .       .       .       .       .       .       X.
292045 180. O       .       .       .       .       .       .       .       .       .       .       X.
292100 181. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .X.
292115 182. O       .       .       .       .       .       .       .       .       .       .       X.
292130 183. O       .       .       .       .       .       .       .       .       .       .       L.
292145 184. O       .       .       .       .       .       .       .       .       .       .       L.
292200 185. O       .       .       .       .       .       .       .       .       .       .       L.
292215 186. O       .       .       .       .       .       .       .       .       .       .       L.
292230 187. O       .       .       .       .       .       .       .       .       .       .       L.
292245 188. O       .       .       .       .       .       .       .       .       .       .       L.
292300 189. O       .       .       .       .       .       .       .       .       .       .       L.
292315 190. O       .       .       .       .       .       .       .       .       .       .       L.
292330 191. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .L.
292345 192. O       .       .       .       .       .       .       .       .       .       .       L.
300000 193.O        .       .       .       .       .       .       .       .       .       .       L.
300015 194.O        .       .       .       .       .       .       .       .       .       .       .
300030 195.O        .       .       .       .       .       .       .       .       .       .       .
300045 196.O        .       .       .       .       .       .       .       .       .       .       .
300100 197.O        .       .       .       .       .       .       .       .       .       .       .
300115 198.O        .       .       .       .       .       .       .       .       .       .       .
300130 199.O        .       .       .       .       .       .       .       .       .       .       .
300145 200.O        .       .       .       .       .       .       .       .       .       .       .
300200 201.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300215 202.O        .       .       .       .       .       .       .       .       .       .       .
300230 203.O        .       .       .       .       .       .       .       .       .       .       .
300245 204.O        .       .       .       .       .       .       .       .       .       .       .
300300 205.O        .       .       .       .       .       .       .       .       .       .       .
300315 206.O        .       .       .       .       .       .       .       .       .       .       .
300330 207.O        .       .       .       .       .       .       .       .       .       .       .
300345 208.O        .       .       .       .       .       .       .       .       .       .       .
300400 209.O        .       .       .       .       .       .       .       .       .       .       .
300415 210.O        .       .       .       .       .       .       .       .       .       .       .
300430 211.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300445 212.O        .       .       .       .       .       .       .       .       .       .       .
300500 213.O        .       .       .       .       .       .       .       .       .       .       .
300515 214.O        .       .       .       .       .       .       .       .       .       .       .
300530 215.O        .       .       .       .       .       .       .       .       .       .       .
300545 216.O        .       .       .       .       .       .       .       .       .       .       .
300600 217.O        .       .       .       .       .       .       .       .       .       .       .
300615 218.O        .       .       .       .       .       .       .       .       .       .       .
300630 219.O        .       .       .       .       .       .       .       .       .       .       .
300645 220.O        .       .       .       .       .       .       .       .       .       .       .
300700 221.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300715 222O         .       .       .       .       .       .       .       .       .       .       .
300730 223O         .       .       .       .       .       .       .       .       .       .       .
300745 224O         .       .       .       .       .       .       .       .       .       .       .
300800 225O         .       .       .       .       .       .       .       .       .       .       .
300815 226O         .       .       .       .       .       .       .       .       .       .       .
300830 227O         .       .       .       .       .       .       .       .       .       .       .
300845 228O         .       .       .       .       .       .       .       .       .       .       .
300900 229O         .       .       .       .       .       .       .       .       .       .       .
300915 230O         .       .       .       .       .       .       .       .       .       .       .
300930 231O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300945 232O         .       .       .       .       .       .       .       .       .       .       .
301000 233O         .       .       .       .       .       .       .       .       .       .       .
301015 234O         .       .       .       .       .       .       .       .       .       .       .
301030 235O         .       .       .       .       .       .       .       .       .       .       .
301045 236O         .       .       .       .       .       .       .       .       .       .       .
301100 237O         .       .       .       .       .       .       .       .       .       .       .
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301115 2380
301130 2390
301145 2400
301200 2410
301215 2420
301230 2430
301245 2440
301300 2450
301315 2460
301330 2470
301345 2480
301400 2490
301415 2500
301430 2510
301445 2520
301500 2530
301515 2540
301530 2550
301545 2560
301600 2570
301615 2580
301630 2590
301645 2600
301700 2610
301715 2620
301730 2630
301745 2640
301800 2650
301815 2660
301830 2670
301845 2680
301900 2690
301915 2700
301930 2710
301945 2720
302000 2730
302015 2740
302030 2750
302045 2760
302100 2770
302115 2780
302130 2790
302145 2800
302200 2810
302215 2820
302230 2830
302245 2840
302300 2850
302315 2860
302330 2870
302345 2880---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
1

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          **************
          *            *
 40 KK    *    LAKE    *
          *            *
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SUBBASIN RUNOFF DATA

41 BA SUBBASIN CHARACTERISTICS
TAREA .27 SUBBASIN AREA

PRECIPITATION DATA

7 PB STORM 48.97 BASIN TOTAL PRECIPITATION

7 PI INCREMENTAL PRECIPITATION PATTERN

.03	.03	.03	.02	.02	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.02
.02	.02	.02	.02	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.04	.04
.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
.04	.04	.05	.05	.05	.05	.05	.05	.05	.05
.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
.05	.05	.05	.05	.05	.05	.08	.08	.08	.08
.08	.08	.08	.08	.08	.09	.09	.09	.09	.09
.09	.09	.09	.09	.10	.10	.10	.10	.10	.11
.18	.18	.19	.19	.20	.21	.21	.22	.23	.23
.24	.25	.25	.26	.27	.27	.28	.29	.29	.30
.31	.31	.32	.33	.35	.41	.47	.52	.56	.59
.67	.84	.84	1.02	2.53	5.07	5.46	3.70	1.33	.86
.88	.77	.60	.58	.54	.50	.44	.38	.17	.17
.16	.16	.15	.15	.14	.14	.14	.13	.13	.13
.13	.12	.12	.12	.12	.11	.11	.11	.11	.11
.11	.11	.07	.07	.07	.07	.07	.07	.07	.07
.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
.07	.07	.07	.07	.07	.07	.05	.05	.05	.05
.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03			

43 LU UNIFORM LOSS RATE
STRTL .00 INITIAL LOSS
CNSTL .00 UNIFORM LOSS RATE
RTIMP .00 PERCENT IMPERVIOUS AREA

41 UI INPUT UNITGRAPH, 1 ORDINATES. VOLUME = 1.00
697.0

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HYDROGRAPH AT STATION LAKE

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
28 NOV 0000	1	.00	.00	.00	0.	29 NOV 1200	145	.33	.00	.33	229.
28 NOV 0015	2	.03	.00	.03	17.	29 NOV 1215	146	.35	.00	.35	244.
28 NOV 0030	3	.03	.00	.03	17.	29 NOV 1230	147	.41	.00	.41	289.
28 NOV 0045	4	.03	.00	.03	17.	29 NOV 1245	148	.47	.00	.47	328.

28 NOV 0100	5	.02	.00	.02	17.	*	29 NOV 1300	149	.52	.00	.52	362.
28 NOV 0115	6	.02	.00	.02	17.	*	29 NOV 1315	150	.56	.00	.56	390.
28 NOV 0130	7	.03	.00	.03	17.	*	29 NOV 1330	151	.59	.00	.59	411.
28 NOV 0145	8	.03	.00	.03	17.	*	29 NOV 1345	152	.67	.00	.67	467.
28 NOV 0200	9	.03	.00	.03	17.	*	29 NOV 1400	153	.84	.00	.84	586.
28 NOV 0215	10	.03	.00	.03	17.	*	29 NOV 1415	154	.84	.00	.84	589.
28 NOV 0230	11	.03	.00	.03	17.	*	29 NOV 1430	155	1.02	.00	1.02	710.
28 NOV 0245	12	.03	.00	.03	17.	*	29 NOV 1445	156	2.53	.00	2.53	1766.
28 NOV 0300	13	.03	.00	.03	17.	*	29 NOV 1500	157	5.07	.00	5.07	3533.
28 NOV 0315	14	.03	.00	.03	17.	*	29 NOV 1515	158	5.46	.00	5.46	3808.
28 NOV 0330	15	.03	.00	.03	17.	*	29 NOV 1530	159	3.70	.00	3.70	2580.
28 NOV 0345	16	.03	.00	.03	17.	*	29 NOV 1545	160	1.33	.00	1.33	924.
28 NOV 0400	17	.03	.00	.03	17.	*	29 NOV 1600	161	.86	.00	.86	598.
28 NOV 0415	18	.03	.00	.03	17.	*	29 NOV 1615	162	.88	.00	.88	613.
28 NOV 0430	19	.03	.00	.03	17.	*	29 NOV 1630	163	.77	.00	.77	537.
28 NOV 0445	20	.03	.00	.03	17.	*	29 NOV 1645	164	.60	.00	.60	420.
28 NOV 0500	21	.02	.00	.02	17.	*	29 NOV 1700	165	.58	.00	.58	401.
28 NOV 0515	22	.02	.00	.02	17.	*	29 NOV 1715	166	.54	.00	.54	376.
28 NOV 0530	23	.02	.00	.02	17.	*	29 NOV 1730	167	.50	.00	.50	346.
28 NOV 0545	24	.02	.00	.02	17.	*	29 NOV 1745	168	.44	.00	.44	309.
28 NOV 0600	25	.02	.00	.02	17.	*	29 NOV 1800	169	.38	.00	.38	267.
28 NOV 0615	26	.03	.00	.03	22.	*	29 NOV 1815	170	.17	.00	.17	118.
28 NOV 0630	27	.03	.00	.03	22.	*	29 NOV 1830	171	.17	.00	.17	115.
28 NOV 0645	28	.03	.00	.03	22.	*	29 NOV 1845	172	.16	.00	.16	112.
28 NOV 0700	29	.03	.00	.03	22.	*	29 NOV 1900	173	.16	.00	.16	109.
28 NOV 0715	30	.03	.00	.03	22.	*	29 NOV 1915	174	.15	.00	.15	106.
28 NOV 0730	31	.03	.00	.03	22.	*	29 NOV 1930	175	.15	.00	.15	103.
28 NOV 0745	32	.03	.00	.03	22.	*	29 NOV 1945	176	.14	.00	.14	100.
28 NOV 0800	33	.03	.00	.03	22.	*	29 NOV 2000	177	.14	.00	.14	98.
28 NOV 0815	34	.03	.00	.03	22.	*	29 NOV 2015	178	.14	.00	.14	95.
28 NOV 0830	35	.03	.00	.03	22.	*	29 NOV 2030	179	.13	.00	.13	93.
28 NOV 0845	36	.03	.00	.03	22.	*	29 NOV 2045	180	.13	.00	.13	91.
28 NOV 0900	37	.03	.00	.03	22.	*	29 NOV 2100	181	.13	.00	.13	89.
28 NOV 0915	38	.03	.00	.03	22.	*	29 NOV 2115	182	.13	.00	.13	87.
28 NOV 0930	39	.03	.00	.03	22.	*	29 NOV 2130	183	.12	.00	.12	86.
28 NOV 0945	40	.03	.00	.03	22.	*	29 NOV 2145	184	.12	.00	.12	84.
28 NOV 1000	41	.03	.00	.03	22.	*	29 NOV 2200	185	.12	.00	.12	82.
28 NOV 1015	42	.03	.00	.03	22.	*	29 NOV 2215	186	.12	.00	.12	81.
28 NOV 1030	43	.03	.00	.03	22.	*	29 NOV 2230	187	.11	.00	.11	79.
28 NOV 1045	44	.03	.00	.03	22.	*	29 NOV 2245	188	.11	.00	.11	78.
28 NOV 1100	45	.03	.00	.03	22.	*	29 NOV 2300	189	.11	.00	.11	77.
28 NOV 1115	46	.03	.00	.03	22.	*	29 NOV 2315	190	.11	.00	.11	76.
28 NOV 1130	47	.03	.00	.03	22.	*	29 NOV 2330	191	.11	.00	.11	75.
28 NOV 1145	48	.03	.00	.03	22.	*	29 NOV 2345	192	.11	.00	.11	75.
28 NOV 1200	49	.03	.00	.03	22.	*	30 NOV 0000	193	.11	.00	.11	74.
28 NOV 1215	50	.04	.00	.04	27.	*	30 NOV 0015	194	.07	.00	.07	47.
28 NOV 1230	51	.04	.00	.04	27.	*	30 NOV 0030	195	.07	.00	.07	47.
28 NOV 1245	52	.04	.00	.04	27.	*	30 NOV 0045	196	.07	.00	.07	47.
28 NOV 1300	53	.04	.00	.04	27.	*	30 NOV 0100	197	.07	.00	.07	47.
28 NOV 1315	54	.04	.00	.04	27.	*	30 NOV 0115	198	.07	.00	.07	47.
28 NOV 1330	55	.04	.00	.04	27.	*	30 NOV 0130	199	.07	.00	.07	47.
28 NOV 1345	56	.04	.00	.04	27.	*	30 NOV 0145	200	.07	.00	.07	47.
28 NOV 1400	57	.04	.00	.04	27.	*	30 NOV 0200	201	.07	.00	.07	47.
28 NOV 1415	58	.04	.00	.04	27.	*	30 NOV 0215	202	.07	.00	.07	47.
28 NOV 1430	59	.04	.00	.04	27.	*	30 NOV 0230	203	.07	.00	.07	47.
28 NOV 1445	60	.04	.00	.04	27.	*	30 NOV 0245	204	.07	.00	.07	47.
28 NOV 1500	61	.04	.00	.04	27.	*	30 NOV 0300	205	.07	.00	.07	47.
28 NOV 1515	62	.04	.00	.04	27.	*	30 NOV 0315	206	.07	.00	.07	47.
28 NOV 1530	63	.04	.00	.04	27.	*	30 NOV 0330	207	.07	.00	.07	47.
28 NOV 1545	64	.04	.00	.04	27.	*	30 NOV 0345	208	.07	.00	.07	47.
28 NOV 1600	65	.04	.00	.04	27.	*	30 NOV 0400	209	.07	.00	.07	47.
28 NOV 1615	66	.04	.00	.04	27.	*	30 NOV 0415	210	.07	.00	.07	47.
28 NOV 1630	67	.04	.00	.04	27.	*	30 NOV 0430	211	.07	.00	.07	47.

28 NOV 1645	68	.04	.00	.04	27.	*	30 NOV 0445	212	.07	.00	.07	47.
28 NOV 1700	69	.04	.00	.04	27.	*	30 NOV 0500	213	.07	.00	.07	47.
28 NOV 1715	70	.04	.00	.04	27.	*	30 NOV 0515	214	.07	.00	.07	47.
28 NOV 1730	71	.04	.00	.04	27.	*	30 NOV 0530	215	.07	.00	.07	47.
28 NOV 1745	72	.04	.00	.04	27.	*	30 NOV 0545	216	.07	.00	.07	47.
28 NOV 1800	73	.04	.00	.04	27.	*	30 NOV 0600	217	.07	.00	.07	47.
28 NOV 1815	74	.05	.00	.05	38.	*	30 NOV 0615	218	.05	.00	.05	32.
28 NOV 1830	75	.05	.00	.05	38.	*	30 NOV 0630	219	.05	.00	.05	32.
28 NOV 1845	76	.05	.00	.05	38.	*	30 NOV 0645	220	.05	.00	.05	32.
28 NOV 1900	77	.05	.00	.05	38.	*	30 NOV 0700	221	.05	.00	.05	32.
28 NOV 1915	78	.05	.00	.05	38.	*	30 NOV 0715	222	.05	.00	.05	32.
28 NOV 1930	79	.05	.00	.05	38.	*	30 NOV 0730	223	.05	.00	.05	32.
28 NOV 1945	80	.05	.00	.05	38.	*	30 NOV 0745	224	.05	.00	.05	32.
28 NOV 2000	81	.05	.00	.05	38.	*	30 NOV 0800	225	.05	.00	.05	32.
28 NOV 2015	82	.05	.00	.05	38.	*	30 NOV 0815	226	.05	.00	.05	32.
28 NOV 2030	83	.05	.00	.05	38.	*	30 NOV 0830	227	.05	.00	.05	32.
28 NOV 2045	84	.05	.00	.05	38.	*	30 NOV 0845	228	.05	.00	.05	32.
28 NOV 2100	85	.05	.00	.05	38.	*	30 NOV 0900	229	.05	.00	.05	32.
28 NOV 2115	86	.05	.00	.05	38.	*	30 NOV 0915	230	.05	.00	.05	32.
28 NOV 2130	87	.05	.00	.05	38.	*	30 NOV 0930	231	.05	.00	.05	32.
28 NOV 2145	88	.05	.00	.05	38.	*	30 NOV 0945	232	.05	.00	.05	32.
28 NOV 2200	89	.05	.00	.05	38.	*	30 NOV 1000	233	.05	.00	.05	32.
28 NOV 2215	90	.05	.00	.05	38.	*	30 NOV 1015	234	.05	.00	.05	32.
28 NOV 2230	91	.05	.00	.05	38.	*	30 NOV 1030	235	.05	.00	.05	32.
28 NOV 2245	92	.05	.00	.05	38.	*	30 NOV 1045	236	.05	.00	.05	32.
28 NOV 2300	93	.05	.00	.05	38.	*	30 NOV 1100	237	.05	.00	.05	32.
28 NOV 2315	94	.05	.00	.05	38.	*	30 NOV 1115	238	.05	.00	.05	32.
28 NOV 2330	95	.05	.00	.05	38.	*	30 NOV 1130	239	.05	.00	.05	32.
28 NOV 2345	96	.05	.00	.05	38.	*	30 NOV 1145	240	.05	.00	.05	32.
29 NOV 0000	97	.05	.00	.05	38.	*	30 NOV 1200	241	.05	.00	.05	32.
29 NOV 0015	98	.08	.00	.08	54.	*	30 NOV 1215	242	.03	.00	.03	24.
29 NOV 0030	99	.08	.00	.08	54.	*	30 NOV 1230	243	.03	.00	.03	24.
29 NOV 0045	100	.08	.00	.08	55.	*	30 NOV 1245	244	.03	.00	.03	24.
29 NOV 0100	101	.08	.00	.08	55.	*	30 NOV 1300	245	.03	.00	.03	24.
29 NOV 0115	102	.08	.00	.08	56.	*	30 NOV 1315	246	.03	.00	.03	24.
29 NOV 0130	103	.08	.00	.08	56.	*	30 NOV 1330	247	.03	.00	.03	24.
29 NOV 0145	104	.08	.00	.08	57.	*	30 NOV 1345	248	.03	.00	.03	24.
29 NOV 0200	105	.08	.00	.08	58.	*	30 NOV 1400	249	.03	.00	.03	24.
29 NOV 0215	106	.08	.00	.08	59.	*	30 NOV 1415	250	.03	.00	.03	24.
29 NOV 0230	107	.09	.00	.09	59.	*	30 NOV 1430	251	.03	.00	.03	24.
29 NOV 0245	108	.09	.00	.09	60.	*	30 NOV 1445	252	.03	.00	.03	24.
29 NOV 0300	109	.09	.00	.09	61.	*	30 NOV 1500	253	.03	.00	.03	24.
29 NOV 0315	110	.09	.00	.09	61.	*	30 NOV 1515	254	.03	.00	.03	24.
29 NOV 0330	111	.09	.00	.09	63.	*	30 NOV 1530	255	.03	.00	.03	24.
29 NOV 0345	112	.09	.00	.09	63.	*	30 NOV 1545	256	.03	.00	.03	24.
29 NOV 0400	113	.09	.00	.09	64.	*	30 NOV 1600	257	.03	.00	.03	24.
29 NOV 0415	114	.09	.00	.09	66.	*	30 NOV 1615	258	.03	.00	.03	24.
29 NOV 0430	115	.09	.00	.09	66.	*	30 NOV 1630	259	.03	.00	.03	24.
29 NOV 0445	116	.10	.00	.10	68.	*	30 NOV 1645	260	.03	.00	.03	24.
29 NOV 0500	117	.10	.00	.10	68.	*	30 NOV 1700	261	.03	.00	.03	24.
29 NOV 0515	118	.10	.00	.10	70.	*	30 NOV 1715	262	.03	.00	.03	24.
29 NOV 0530	119	.10	.00	.10	71.	*	30 NOV 1730	263	.03	.00	.03	24.
29 NOV 0545	120	.10	.00	.10	72.	*	30 NOV 1745	264	.03	.00	.03	24.
29 NOV 0600	121	.11	.00	.11	73.	*	30 NOV 1800	265	.03	.00	.03	24.
29 NOV 0615	122	.18	.00	.18	122.	*	30 NOV 1815	266	.03	.00	.03	20.
29 NOV 0630	123	.18	.00	.18	126.	*	30 NOV 1830	267	.03	.00	.03	20.
29 NOV 0645	124	.19	.00	.19	131.	*	30 NOV 1845	268	.03	.00	.03	20.
29 NOV 0700	125	.19	.00	.19	135.	*	30 NOV 1900	269	.03	.00	.03	20.
29 NOV 0715	126	.20	.00	.20	139.	*	30 NOV 1915	270	.03	.00	.03	20.
29 NOV 0730	127	.21	.00	.21	144.	*	30 NOV 1930	271	.03	.00	.03	20.
29 NOV 0745	128	.21	.00	.21	148.	*	30 NOV 1945	272	.03	.00	.03	20.
29 NOV 0800	129	.22	.00	.22	153.	*	30 NOV 2000	273	.03	.00	.03	20.
29 NOV 0815	130	.23	.00	.23	158.	*	30 NOV 2015	274	.03	.00	.03	20.

29 NOV 0830	131	.23	.00	.23	162.	*	30 NOV 2030	275	.03	.00	.03	20.
29 NOV 0845	132	.24	.00	.24	167.	*	30 NOV 2045	276	.03	.00	.03	20.
29 NOV 0900	133	.25	.00	.25	171.	*	30 NOV 2100	277	.03	.00	.03	20.
29 NOV 0915	134	.25	.00	.25	176.	*	30 NOV 2115	278	.03	.00	.03	20.
29 NOV 0930	135	.26	.00	.26	181.	*	30 NOV 2130	279	.03	.00	.03	20.
29 NOV 0945	136	.27	.00	.27	186.	*	30 NOV 2145	280	.03	.00	.03	20.
29 NOV 1000	137	.27	.00	.27	190.	*	30 NOV 2200	281	.03	.00	.03	20.
29 NOV 1015	138	.28	.00	.28	195.	*	30 NOV 2215	282	.03	.00	.03	20.
29 NOV 1030	139	.29	.00	.29	200.	*	30 NOV 2230	283	.03	.00	.03	20.
29 NOV 1045	140	.29	.00	.29	205.	*	30 NOV 2245	284	.03	.00	.03	20.
29 NOV 1100	141	.30	.00	.30	210.	*	30 NOV 2300	285	.03	.00	.03	20.
29 NOV 1115	142	.31	.00	.31	215.	*	30 NOV 2315	286	.03	.00	.03	20.
29 NOV 1130	143	.31	.00	.31	220.	*	30 NOV 2330	287	.03	.00	.03	20.
29 NOV 1145	144	.32	.00	.32	224.	*	30 NOV 2345	288	.03	.00	.03	20.
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TOTAL RAINFALL = 48.97, TOTAL LOSS = .00, TOTAL EXCESS = 48.97

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	71.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3808.	39.25		868.	299.	119.	119.
		(INCHES)	29.894	41.199	48.962	48.962
		(AC-FT)	430.	593.	705.	705.

CUMULATIVE AREA = .27 SQ MI

1 STATION LAKE

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                    (O) OUTFLOW
        0.     500.    1000.    1500.    2000.    2500.    3000.    3500.    4000.       0.       0.       0.       0.
                                                                                                (L) PRECIP,  (X) EXCESS
        0.       0.       0.       0.       0.       0.       0.       0.       0.       6.       4.       2.       0.
DAHRMN PER
280000  1O---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
280015  2O         .         .         .         .         .         .         .         .         .         .         .
280030  3O         .         .         .         .         .         .         .         .         .         .         .
280045  4O         .         .         .         .         .         .         .         .         .         .         .
280100  5O         .         .         .         .         .         .         .         .         .         .         .
280115  6O         .         .         .         .         .         .         .         .         .         .         .
280130  7O         .         .         .         .         .         .         .         .         .         .         .
280145  8O         .         .         .         .         .         .         .         .         .         .         .
280200  9O         .         .         .         .         .         .         .         .         .         .         .
280215  1OO        .         .         .         .         .         .         .         .         .         .         .
280230  11O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
280245  12O        .         .         .         .         .         .         .         .         .         .         .
280300  13O        .         .         .         .         .         .         .         .         .         .         .
280315  14O        .         .         .         .         .         .         .         .         .         .         .
280330  15O        .         .         .         .         .         .         .         .         .         .         .
280345  16O        .         .         .         .         .         .         .         .         .         .         .
280400  17O        .         .         .         .         .         .         .         .         .         .         .
280415  18O        .         .         .         .         .         .         .         .         .         .         .
280430  19O        .         .         .         .         .         .         .         .         .         .         .
280445  2OO        .         .         .         .         .         .         .         .         .         .         .
280500  21O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
280515  22O        .         .         .         .         .         .         .         .         .         .         .
280530  23O        .         .         .         .         .         .         .         .         .         .         .
280545  24O        .         .         .         .         .         .         .         .         .         .         .
280600  25O        .         .         .         .         .         .         .         .         .         .         .
280615  26O        .         .         .         .         .         .         .         .         .         .         .
280630  27O        .         .         .         .         .         .         .         .         .         .         .
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280645	28O
280700	29O
280715	30O
280730	31O
280745	32O
280800	33O
280815	34O
280830	35O
280845	36O
280900	37O
280915	38O
280930	39O
280945	40O
281000	41O
281015	42O
281030	43O
281045	44O
281100	45O
281115	46O
281130	47O
281145	48O
281200	49O
281215	50.O
281230	51.O
281245	52.O
281300	53.O
281315	54.O
281330	55.O
281345	56.O
281400	57.O
281415	58.O
281430	59.O
281445	60.O
281500	61.O
281515	62.O
281530	63.O
281545	64.O
281600	65.O
281615	66.O
281630	67.O
281645	68.O
281700	69.O
281715	70.O
281730	71.O
281745	72.O
281800	73.O
281815	74.O
281830	75.O
281845	76.O
281900	77.O
281915	78.O
281930	79.O
281945	80.O
282000	81.O
282015	82.O
282030	83.O
282045	84.O
282100	85.O
282115	86.O
282130	87.O
282145	88.O
282200	89.O
282215	90.O

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282230  91.O.......................................................................................................................
282245  92.O        .         .         .         .         .         .         .         .         .         .         .
282300  93.O        .         .         .         .         .         .         .         .         .         .         .
282315  94.O        .         .         .         .         .         .         .         .         .         .         .
282330  95.O        .         .         .         .         .         .         .         .         .         .         .
282345  96.O        .         .         .         .         .         .         .         .         .         .         .
290000  97.O        .         .         .         .         .         .         .         .         .         .         .
290015  98.O        .         .         .         .         .         .         .         .         .         .         .
290030  99.O        .         .         .         .         .         .         .         .         .         .         .
290045 100.O        .         .         .         .         .         .         .         .         .         .         .
290100 101.O.......................................................................................................................
290115 102.O        .         .         .         .         .         .         .         .         .         .         .
290130 103.O        .         .         .         .         .         .         .         .         .         .         .
290145 104.O        .         .         .         .         .         .         .         .         .         .         .
290200 105.O        .         .         .         .         .         .         .         .         .         .         .
290215 106.O        .         .         .         .         .         .         .         .         .         .         .
290230 107.O        .         .         .         .         .         .         .         .         .         .         .
290245 108.O        .         .         .         .         .         .         .         .         .         .         .
290300 109.O        .         .         .         .         .         .         .         .         .         .         .
290315 110.O        .         .         .         .         .         .         .         .         .         .         .
290330 111.O.......................................................................................................................
290345 112.O        .         .         .         .         .         .         .         .         .         .         .
290400 113.O        .         .         .         .         .         .         .         .         .         .         .
290415 114.O        .         .         .         .         .         .         .         .         .         .         .
290430 115.O        .         .         .         .         .         .         .         .         .         .         .
290445 116.O        .         .         .         .         .         .         .         .         .         .         .
290500 117.O        .         .         .         .         .         .         .         .         .         .         .
290515 118.O        .         .         .         .         .         .         .         .         .         .         .
290530 119.O        .         .         .         .         .         .         .         .         .         .        X.
290545 120.O        .         .         .         .         .         .         .         .         .         .        X.
290600 121.O.....................................................................................................................X.
290615 122. O       .         .         .         .         .         .         .         .         .         .        X.
290630 123.  O      .         .         .         .         .         .         .         .         .         .        X.
290645 124.  O      .         .         .         .         .         .         .         .         .         .        X.
290700 125.  O      .         .         .         .         .         .         .         .         .         .        X.
290715 126.  O      .         .         .         .         .         .         .         .         .         .        X.
290730 127.  O      .         .         .         .         .         .         .         .         .         .        X.
290745 128.  O      .         .         .         .         .         .         .         .         .         .        X.
290800 129.  O      .         .         .         .         .         .         .         .         .         .        X.
290815 130.  O      .         .         .         .         .         .         .         .         .         .        X.
290830 131. .O...................................................................................................................X.
290845 132.  O      .         .         .         .         .         .         .         .         .         .        X.
290900 133.  O      .         .         .         .         .         .         .         .         .         .        X.
290915 134.   O     .         .         .         .         .         .         .         .         .         .        X.
290930 135.   O     .         .         .         .         .         .         .         .         .         .        X.
290945 136.   O     .         .         .         .         .         .         .         .         .         .        X.
291000 137.   O     .         .         .         .         .         .         .         .         .         .        X.
291015 138.   O     .         .         .         .         .         .         .         .         .         .        X.
291030 139.   O     .         .         .         .         .         .         .         .         .         .        X.
291045 140.   O     .         .         .         .         .         .         .         .         .         .        X.
291100 141. . O.................................................................................................................XX.
291115 142.   O     .         .         .         .         .         .         .         .         .         .       XX.
291130 143.   O     .         .         .         .         .         .         .         .         .         .       XX.
291145 144.   O     .         .         .         .         .         .         .         .         .         .       XX.
291200 145.    O    .         .         .         .         .         .         .         .         .         .       XX.
291215 146.    O    .         .         .         .         .         .         .         .         .         .       XX.
291230 147.     O   .         .         .         .         .         .         .         .         .         .       XX.
291245 148.      O  .         .         .         .         .         .         .         .         .         .       XX.
291300 149.      O  .         .         .         .         .         .         .         .         .         .      XXX.
291315 150.       O .         .         .         .         .         .         .         .         .         .      XXX.
291330 151. . . . O............................................................................................................XXX.
291345 152.        O.         .         .         .         .         .         .         .         .         .      XXX.
291400 153.         . O       .         .         .         .         .         .         .         .         .     XXXX.
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291415 154.         . O      .        .        .        .        .        .        .        .        .    XXXX.
291430 155.         .   O    .        .        .        .        .        .        .        .        .   XXXXX.
291445 156.         .        .        .   O    .        .        .        .        .        .     XXXXXXXXXXXX.
291500 157.         .        .        .        .        .        .        .O       .        .  XXXXXXXXXXXXXXXXXXXXXXXX.
291515 158.         .        .        .        .        .        .        .    O   .        . XXXXXXXXXXXXXXXXXXXXXXXXXXX.
291530 159.         .        .        .        .        . O      .        .        .        .        .XXXXXXXXXXXXXXXXXX.
291545 160.         .      O .        .        .        .        .        .        .        .        .         . XXXXXXX.
291600 161. . . . . . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . XXXX.
291615 162.         . O      .        .        .        .        .        .        .        .        .    XXXX.
291630 163.         .O       .        .        .        .        .        .        .        .        .    XXXX.
291645 164.       O .        .        .        .        .        .        .        .        .        .     XXX.
291700 165.       O .        .        .        .        .        .        .        .        .        .     XXX.
291715 166.       O .        .        .        .        .        .        .        .        .        .     XXX.
291730 167.      O  .        .        .        .        .        .        .        .        .        .      XX.
291745 168.     O   .        .        .        .        .        .        .        .        .        .      XX.
291800 169.    O    .        .        .        .        .        .        .        .        .        .      XX.
291815 170. O       .        .        .        .        .        .        .        .        .        .       X.
291830 171. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .X.
291845 172. O       .        .        .        .        .        .        .        .        .        .       X.
291900 173. O       .        .        .        .        .        .        .        .        .        .       X.
291915 174. O       .        .        .        .        .        .        .        .        .        .       X.
291930 175. O       .        .        .        .        .        .        .        .        .        .       X.
291945 176. O       .        .        .        .        .        .        .        .        .        .       X.
292000 177. O       .        .        .        .        .        .        .        .        .        .       X.
292015 178. O       .        .        .        .        .        .        .        .        .        .       X.
292030 179. O       .        .        .        .        .        .        .        .        .        .       X.
292045 180. O       .        .        .        .        .        .        .        .        .        .       X.
292100 181. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .X.
292115 182. O       .        .        .        .        .        .        .        .        .        .       X.
292130 183. O       .        .        .        .        .        .        .        .        .        .       X.
292145 184. O       .        .        .        .        .        .        .        .        .        .       X.
292200 185. O       .        .        .        .        .        .        .        .        .        .       X.
292215 186. O       .        .        .        .        .        .        .        .        .        .       X.
292230 187. O       .        .        .        .        .        .        .        .        .        .       X.
292245 188. O       .        .        .        .        .        .        .        .        .        .       X.
292300 189. O       .        .        .        .        .        .        .        .        .        .       X.
292315 190. O       .        .        .        .        .        .        .        .        .        .       X.
292330 191. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .X.
292345 192.O        .        .        .        .        .        .        .        .        .        .       X.
300000 193.O        .        .        .        .        .        .        .        .        .        .       X.
300015 194.O        .        .        .        .        .        .        .        .        .        .        .
300030 195.O        .        .        .        .        .        .        .        .        .        .        .
300045 196.O        .        .        .        .        .        .        .        .        .        .        .
300100 197.O        .        .        .        .        .        .        .        .        .        .        .
300115 198.O        .        .        .        .        .        .        .        .        .        .        .
300130 199.O        .        .        .        .        .        .        .        .        .        .        .
300145 200.O        .        .        .        .        .        .        .        .        .        .        .
300200 201.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300215 202.O        .        .        .        .        .        .        .        .        .        .        .
300230 203.O        .        .        .        .        .        .        .        .        .        .        .
300245 204.O        .        .        .        .        .        .        .        .        .        .        .
300300 205.O        .        .        .        .        .        .        .        .        .        .        .
300315 206.O        .        .        .        .        .        .        .        .        .        .        .
300330 207.O        .        .        .        .        .        .        .        .        .        .        .
300345 208.O        .        .        .        .        .        .        .        .        .        .        .
300400 209.O        .        .        .        .        .        .        .        .        .        .        .
300415 210.O        .        .        .        .        .        .        .        .        .        .        .
300430 211.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
300445 212.O        .        .        .        .        .        .        .        .        .        .        .
300500 213.O        .        .        .        .        .        .        .        .        .        .        .
300515 214.O        .        .        .        .        .        .        .        .        .        .        .
300530 215.O        .        .        .        .        .        .        .        .        .        .        .
300545 216.O        .        .        .        .        .        .        .        .        .        .        .
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300600 217.0
300615 218.0
300630 219.0
300645 220.0
300700 221.0
300715 222.0
300730 223.0
300745 224.0
300800 225.0
300815 226.0
300830 227.0
300845 228.0
300900 229.0
300915 230.0
300930 231.0
300945 232.0
301000 233.0
301015 234.0
301030 235.0
301045 236.0
301100 237.0
301115 238.0
301130 239.0
301145 240.0
301200 241.0
301215 242O
301230 243O
301245 244O
301300 245O
301315 246O
301330 247O
301345 248O
301400 249O
301415 250O
301430 251O
301445 252O
301500 253O
301515 254O
301530 255O
301545 256O
301600 257O
301615 258O
301630 259O
301645 260O
301700 261O
301715 262O
301730 263O
301745 264O
301800 265O
301815 266O
301830 267O
301845 268O
301900 269O
301915 270O
301930 271O
301945 272O
302000 273O
302015 274O
302030 275O
302045 276O
302100 277O
302115 278O
302130 279O

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302145 2800         .         .         .         .         .         .         .         .         .         .         .         .
302200 2810 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
302215 2820         .         .         .         .         .         .         .         .         .         .         .         .
302230 2830         .         .         .         .         .         .         .         .         .         .         .         .
302245 2840         .         .         .         .         .         .         .         .         .         .         .         .
302300 2850         .         .         .         .         .         .         .         .         .         .         .         .
302315 2860         .         .         .         .         .         .         .         .         .         .         .         .
302330 2870         .         .         .         .         .         .         .         .         .         .         .         .
302345 2880---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
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          *            *
 44 KK    *   INFLOW   *
          *            *
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 45 HC         HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION INFLOW
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
28 NOV 0000	1	0.	28 NOV 1800	73	76.	29 NOV 1200	145	1197.	30 NOV 0600	217	197.
28 NOV 0015	2	17.	28 NOV 1815	74	88.	29 NOV 1215	146	1238.	30 NOV 0615	218	179.
28 NOV 0030	3	17.	28 NOV 1830	75	93.	29 NOV 1230	147	1318.	30 NOV 0630	219	171.
28 NOV 0045	4	17.	28 NOV 1845	76	103.	29 NOV 1245	148	1416.	30 NOV 0645	220	157.
28 NOV 0100	5	17.	28 NOV 1900	77	114.	29 NOV 1300	149	1542.	30 NOV 0700	221	141.
28 NOV 0115	6	17.	28 NOV 1915	78	124.	29 NOV 1315	150	1696.	30 NOV 0715	222	126.
28 NOV 0130	7	17.	28 NOV 1930	79	130.	29 NOV 1330	151	1863.	30 NOV 0730	223	116.
28 NOV 0145	8	17.	28 NOV 1945	80	134.	29 NOV 1345	152	2073.	30 NOV 0745	224	111.
28 NOV 0200	9	17.	28 NOV 2000	81	136.	29 NOV 1400	153	2365.	30 NOV 0800	225	108.
28 NOV 0215	10	17.	28 NOV 2015	82	137.	29 NOV 1415	154	2574.	30 NOV 0815	226	107.
28 NOV 0230	11	17.	28 NOV 2030	83	138.	29 NOV 1430	155	2945.	30 NOV 0830	227	106.
28 NOV 0245	12	17.	28 NOV 2045	84	138.	29 NOV 1445	156	4446.	30 NOV 0845	228	105.
28 NOV 0300	13	17.	28 NOV 2100	85	138.	29 NOV 1500	157	7305.	30 NOV 0900	229	105.
28 NOV 0315	14	17.	28 NOV 2115	86	138.	29 NOV 1515	158	9713.	30 NOV 0915	230	105.
28 NOV 0330	15	17.	28 NOV 2130	87	138.	29 NOV 1530	159	11334.	30 NOV 0930	231	105.
28 NOV 0345	16	17.	28 NOV 2145	88	138.	29 NOV 1545	160	12068.	30 NOV 0945	232	105.
28 NOV 0400	17	17.	28 NOV 2200	89	138.	29 NOV 1600	161	12454.	30 NOV 1000	233	105.
28 NOV 0415	18	17.	28 NOV 2215	90	138.	29 NOV 1615	162	11272.	30 NOV 1015	234	105.
28 NOV 0430	19	17.	28 NOV 2230	91	138.	29 NOV 1630	163	8945.	30 NOV 1030	235	105.
28 NOV 0445	20	17.	28 NOV 2245	92	138.	29 NOV 1645	164	6631.	30 NOV 1045	236	105.
28 NOV 0500	21	17.	28 NOV 2300	93	138.	29 NOV 1700	165	5020.	30 NOV 1100	237	105.
28 NOV 0515	22	17.	28 NOV 2315	94	138.	29 NOV 1715	166	3962.	30 NOV 1115	238	105.
28 NOV 0530	23	17.	28 NOV 2330	95	138.	29 NOV 1730	167	3239.	30 NOV 1130	239	105.
28 NOV 0545	24	17.	28 NOV 2345	96	138.	29 NOV 1745	168	2716.	30 NOV 1145	240	105.
28 NOV 0600	25	17.	29 NOV 0000	97	138.	29 NOV 1800	169	2314.	30 NOV 1200	241	105.
28 NOV 0615	26	22.	29 NOV 0015	98	157.	29 NOV 1815	170	1872.	30 NOV 1215	242	95.
28 NOV 0630	27	24.	29 NOV 0030	99	166.	29 NOV 1830	171	1594.	30 NOV 1230	243	91.

28 NOV 0645	28	28.	*	29 NOV 0045	100	181.	*	29 NOV 1845	172	1321.	*	30 NOV 1245	244	84.
28 NOV 0700	29	33.	*	29 NOV 0100	101	200.	*	29 NOV 1900	173	1063.	*	30 NOV 1300	245	74.
28 NOV 0715	30	37.	*	29 NOV 0115	102	217.	*	29 NOV 1915	174	856.	*	30 NOV 1315	246	66.
28 NOV 0730	31	39.	*	29 NOV 0130	103	230.	*	29 NOV 1930	175	719.	*	30 NOV 1330	247	61.
28 NOV 0745	32	41.	*	29 NOV 0145	104	238.	*	29 NOV 1945	176	637.	*	30 NOV 1345	248	58.
28 NOV 0800	33	42.	*	29 NOV 0200	105	244.	*	29 NOV 2000	177	585.	*	30 NOV 1400	249	57.
28 NOV 0815	34	42.	*	29 NOV 0215	106	250.	*	29 NOV 2015	178	549.	*	30 NOV 1415	250	56.
28 NOV 0830	35	42.	*	29 NOV 0230	107	255.	*	29 NOV 2030	179	524.	*	30 NOV 1430	251	55.
28 NOV 0845	36	42.	*	29 NOV 0245	108	259.	*	29 NOV 2045	180	503.	*	30 NOV 1445	252	55.
28 NOV 0900	37	42.	*	29 NOV 0300	109	263.	*	29 NOV 2100	181	487.	*	30 NOV 1500	253	55.
28 NOV 0915	38	42.	*	29 NOV 0315	110	268.	*	29 NOV 2115	182	473.	*	30 NOV 1515	254	55.
28 NOV 0930	39	42.	*	29 NOV 0330	111	272.	*	29 NOV 2130	183	460.	*	30 NOV 1530	255	55.
28 NOV 0945	40	42.	*	29 NOV 0345	112	277.	*	29 NOV 2145	184	448.	*	30 NOV 1545	256	55.
28 NOV 1000	41	42.	*	29 NOV 0400	113	282.	*	29 NOV 2200	185	437.	*	30 NOV 1600	257	55.
28 NOV 1015	42	42.	*	29 NOV 0415	114	288.	*	29 NOV 2215	186	426.	*	30 NOV 1615	258	55.
28 NOV 1030	43	42.	*	29 NOV 0430	115	293.	*	29 NOV 2230	187	416.	*	30 NOV 1630	259	55.
28 NOV 1045	44	42.	*	29 NOV 0445	116	299.	*	29 NOV 2245	188	406.	*	30 NOV 1645	260	55.
28 NOV 1100	45	42.	*	29 NOV 0500	117	304.	*	29 NOV 2300	189	398.	*	30 NOV 1700	261	55.
28 NOV 1115	46	42.	*	29 NOV 0515	118	311.	*	29 NOV 2315	190	390.	*	30 NOV 1715	262	55.
28 NOV 1130	47	42.	*	29 NOV 0530	119	317.	*	29 NOV 2330	191	383.	*	30 NOV 1730	263	55.
28 NOV 1145	48	42.	*	29 NOV 0545	120	323.	*	29 NOV 2345	192	376.	*	30 NOV 1745	264	55.
28 NOV 1200	49	42.	*	29 NOV 0600	121	330.	*	30 NOV 0000	193	370.	*	30 NOV 1800	265	55.
28 NOV 1215	50	49.	*	29 NOV 0615	122	392.	*	30 NOV 0015	194	335.	*	30 NOV 1815	266	50.
28 NOV 1230	51	52.	*	29 NOV 0630	123	427.	*	30 NOV 0030	195	318.	*	30 NOV 1830	267	48.
28 NOV 1245	52	57.	*	29 NOV 0645	124	482.	*	30 NOV 0045	196	291.	*	30 NOV 1845	268	44.
28 NOV 1300	53	63.	*	29 NOV 0700	125	549.	*	30 NOV 0100	197	261.	*	30 NOV 1900	269	40.
28 NOV 1315	54	68.	*	29 NOV 0715	126	613.	*	30 NOV 0115	198	234.	*	30 NOV 1915	270	36.
28 NOV 1330	55	72.	*	29 NOV 0730	127	665.	*	30 NOV 0130	199	217.	*	30 NOV 1930	271	33.
28 NOV 1345	56	74.	*	29 NOV 0745	128	705.	*	30 NOV 0145	200	208.	*	30 NOV 1945	272	32.
28 NOV 1400	57	75.	*	29 NOV 0800	129	740.	*	30 NOV 0200	201	202.	*	30 NOV 2000	273	31.
28 NOV 1415	58	75.	*	29 NOV 0815	130	771.	*	30 NOV 0215	202	199.	*	30 NOV 2015	274	30.
28 NOV 1430	59	75.	*	29 NOV 0830	131	801.	*	30 NOV 0230	203	198.	*	30 NOV 2030	275	30.
28 NOV 1445	60	76.	*	29 NOV 0845	132	829.	*	30 NOV 0245	204	197.	*	30 NOV 2045	276	30.
28 NOV 1500	61	76.	*	29 NOV 0900	133	857.	*	30 NOV 0300	205	197.	*	30 NOV 2100	277	30.
28 NOV 1515	62	76.	*	29 NOV 0915	134	885.	*	30 NOV 0315	206	197.	*	30 NOV 2115	278	30.
28 NOV 1530	63	76.	*	29 NOV 0930	135	913.	*	30 NOV 0330	207	197.	*	30 NOV 2130	279	30.
28 NOV 1545	64	76.	*	29 NOV 0945	136	941.	*	30 NOV 0345	208	197.	*	30 NOV 2145	280	30.
28 NOV 1600	65	76.	*	29 NOV 1000	137	968.	*	30 NOV 0400	209	197.	*	30 NOV 2200	281	30.
28 NOV 1615	66	76.	*	29 NOV 1015	138	997.	*	30 NOV 0415	210	197.	*	30 NOV 2215	282	30.
28 NOV 1630	67	76.	*	29 NOV 1030	139	1025.	*	30 NOV 0430	211	197.	*	30 NOV 2230	283	30.
28 NOV 1645	68	76.	*	29 NOV 1045	140	1053.	*	30 NOV 0445	212	197.	*	30 NOV 2245	284	30.
28 NOV 1700	69	76.	*	29 NOV 1100	141	1082.	*	30 NOV 0500	213	197.	*	30 NOV 2300	285	30.
28 NOV 1715	70	76.	*	29 NOV 1115	142	1110.	*	30 NOV 0515	214	197.	*	30 NOV 2315	286	30.
28 NOV 1730	71	76.	*	29 NOV 1130	143	1139.	*	30 NOV 0530	215	197.	*	30 NOV 2330	287	30.
28 NOV 1745	72	76.	*	29 NOV 1145	144	1168.	*	30 NOV 0545	216	197.	*	30 NOV 2345	288	30.
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	71.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 12454.	40.00		5055.	1700.	624.	624.
		(INCHES)	29.010	39.023	42.831	42.831
		(AC-FT)	2506.	3372.	3701.	3701.

CUMULATIVE AREA = 1.62 SQ MI

1 STATION INFLOW

(O) OUTFLOW

0.	2000.	4000.	6000.	8000.	10000.	12000.	14000.	0.	0.	0.	0.	0.

DAHRMN PER

280000	10
280015	20
280030	30
280045	40
280100	50
280115	60
280130	70
280145	80
280200	90
280215	100
280230	110
280245	120
280300	130
280315	140
280330	150
280345	160
280400	170
280415	180
280430	190
280445	200
280500	210
280515	220
280530	230
280545	240
280600	250
280615	260
280630	270
280645	280
280700	290
280715	300
280730	310
280745	320
280800	330
280815	340
280830	350
280845	360
280900	370
280915	380
280930	390
280945	400
281000	410
281015	420
281030	430
281045	440
281100	450
281115	460
281130	470
281145	480
281200	490
281215	500
281230	510
281245	520
281300	530
281315	540
281330	550
281345	560
281400	570
281415	580
281430	590
281445	600
281500	610
281515	620
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281630	670
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281715	700
281730	710
281745	720
281800	730
281815	740
281830	750
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281900	77.0
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281930	79.0
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282000	81.0
282015	82.0
282030	83.0
282045	84.0
282100	85.0
282115	86.0
282130	87.0
282145	88.0
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282215	90.0
282230	91.0
282245	92.0
282300	93.0
282315	94.0
282330	95.0
282345	96.0
290000	97.0
290015	98.0
290030	99.0
290045	100.0
290100	101.0
290115	102.0
290130	103.0
290145	104.0
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290215	106.0
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290315	110.0
290330	111.0
290345	112.0
290400	113.0
290415	114.0
290430	115.0
290445	116.0
290500	117. 0
290515	118. 0
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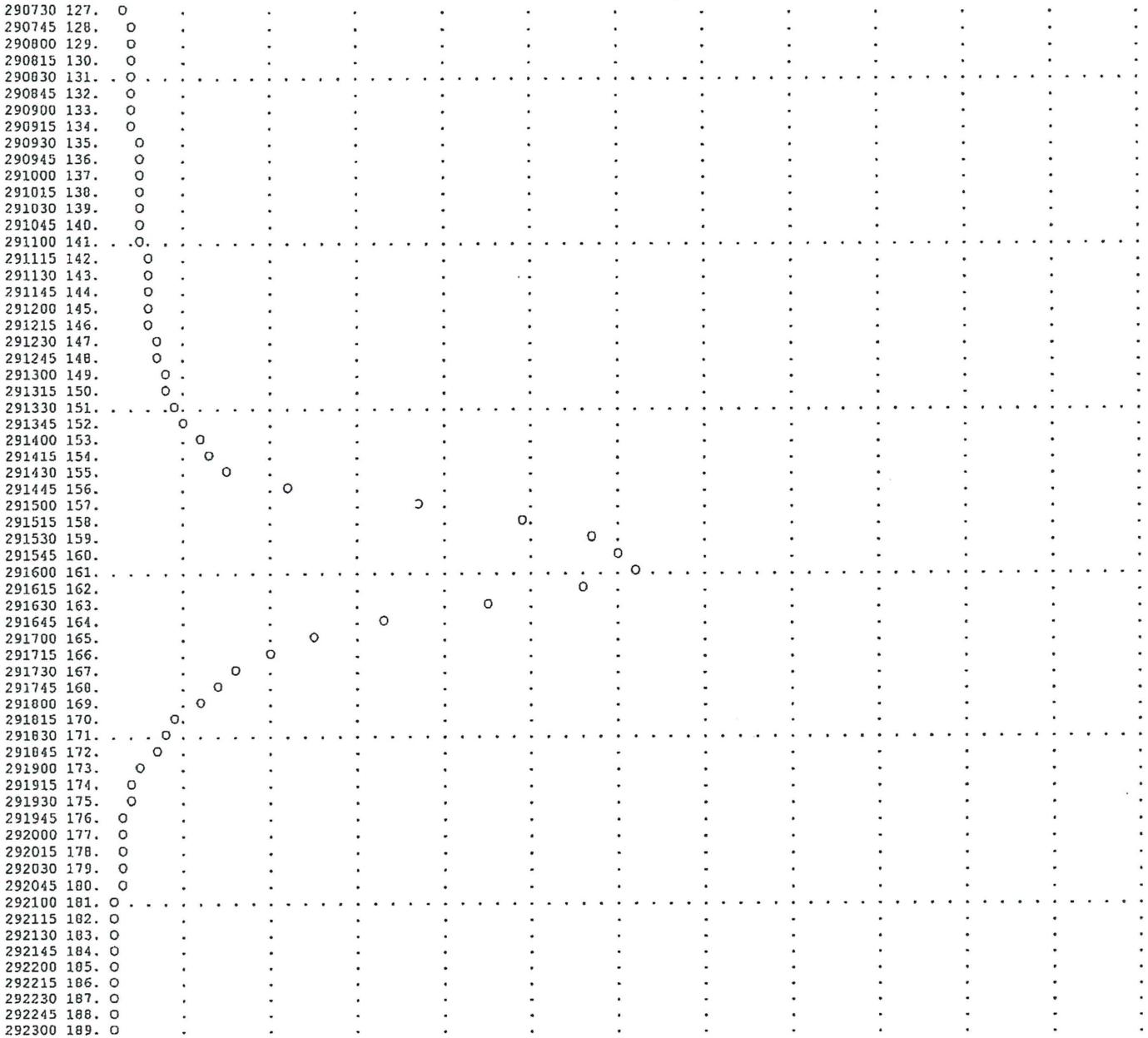
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292300 189.

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301715 2620        .         .         .         .         .         .         .         .         .         .         .         .
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301930 2710 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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302345 2880---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
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            *            *
 46 KK      *    IN-FNI  *
            *            *
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               HYDROGRAPH ROUTING DATA

 47 RS           STORAGE ROUTING
                      NSTPS          1  NUMBER OF SUBREACHES
                       ITYP       ELEV  TYPE OF INITIAL CONDITION
                     RSVRIC     785.00  INITIAL CONDITION
                          X        .00 WORKING R AND D COEFFICIENT

 48 SV             STORAGE     4118.0    4289.0    4464.0    4643.0    4826.0    5013.0    5205.0    5402.0    5605.0    5814.0
                               6028.0    6248.0    6474.0    6707.0    6946.0    7190.0

 50 SE           ELEVATION     785.00    786.00    787.00    788.00    789.00    790.00    791.00    792.00    793.00    794.00
                               795.00    796.00    797.00    798.00    799.00    800.00
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52 SQ DISCHARGE 0. 96. 136. 166. 192. 215. 735. 1668. 2070. 4288.
5894. 7667. 9593. 11660. 13859. 16183.

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HYDROGRAPH AT STATION IN-FNI

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
28	NOV	0000	1	0.	4118.0	785.0	29	NOV	0000	97	52.	4210.7	785.5	30	NOV	0000	193	792.	5217.0	791.1
28	NOV	0015	2	0.	4118.2	785.0	29	NOV	0015	98	53.	4212.6	785.6	30	NOV	0015	194	751.	5208.3	791.0
28	NOV	0030	3	0.	4118.5	785.0	29	NOV	0030	99	54.	4214.9	785.6	30	NOV	0030	195	721.	5199.9	791.0
28	NOV	0045	4	0.	4118.9	785.0	29	NOV	0045	100	56.	4217.3	785.6	30	NOV	0045	196	698.	5191.5	790.9
28	NOV	0100	5	1.	4119.2	785.0	29	NOV	0100	101	57.	4220.1	785.6	30	NOV	0100	197	675.	5183.0	790.9
28	NOV	0115	6	1.	4119.6	785.0	29	NOV	0115	102	59.	4223.2	785.6	30	NOV	0115	198	652.	5174.4	790.8
28	NOV	0130	7	1.	4119.9	785.0	29	NOV	0130	103	61.	4226.6	785.6	30	NOV	0130	199	629.	5165.8	790.8
28	NOV	0145	8	1.	4120.3	785.0	29	NOV	0145	104	63.	4230.1	785.7	30	NOV	0145	200	606.	5157.5	790.8
28	NOV	0200	9	1.	4120.6	785.0	29	NOV	0200	105	65.	4233.8	785.7	30	NOV	0200	201	584.	5149.4	790.7
28	NOV	0215	10	2.	4120.9	785.0	29	NOV	0215	106	67.	4237.5	785.7	30	NOV	0215	202	564.	5141.7	790.7
28	NOV	0230	11	2.	4121.2	785.0	29	NOV	0230	107	69.	4241.3	785.7	30	NOV	0230	203	544.	5134.4	790.6
28	NOV	0245	12	2.	4121.6	785.0	29	NOV	0245	108	71.	4245.2	785.7	30	NOV	0245	204	525.	5127.4	790.6
28	NOV	0300	13	2.	4121.9	785.0	29	NOV	0300	109	74.	4249.1	785.8	30	NOV	0300	205	507.	5120.8	790.6
28	NOV	0315	14	2.	4122.2	785.0	29	NOV	0315	110	76.	4253.0	785.8	30	NOV	0315	206	490.	5114.6	790.5
28	NOV	0330	15	3.	4122.5	785.0	29	NOV	0330	111	78.	4257.0	785.8	30	NOV	0330	207	474.	5108.7	790.5
28	NOV	0345	16	3.	4122.8	785.0	29	NOV	0345	112	80.	4261.0	785.8	30	NOV	0345	208	459.	5103.1	790.5
28	NOV	0400	17	3.	4123.1	785.0	29	NOV	0400	113	83.	4265.1	785.9	30	NOV	0400	209	445.	5097.8	790.4
28	NOV	0415	18	3.	4123.4	785.0	29	NOV	0415	114	85.	4269.3	785.9	30	NOV	0415	210	431.	5092.8	790.4
28	NOV	0430	19	3.	4123.7	785.0	29	NOV	0430	115	87.	4273.5	785.9	30	NOV	0430	211	418.	5088.1	790.4
28	NOV	0445	20	3.	4124.0	785.0	29	NOV	0445	116	90.	4277.8	785.9	30	NOV	0445	212	406.	5083.7	790.4
28	NOV	0500	21	4.	4124.3	785.0	29	NOV	0500	117	92.	4282.1	786.0	30	NOV	0500	213	395.	5079.4	790.3
28	NOV	0515	22	4.	4124.6	785.0	29	NOV	0515	118	95.	4286.6	786.0	30	NOV	0515	214	384.	5075.5	790.3
28	NOV	0530	23	4.	4124.9	785.0	29	NOV	0530	119	96.	4291.1	786.0	30	NOV	0530	215	374.	5071.7	790.3
28	NOV	0545	24	4.	4125.1	785.0	29	NOV	0545	120	98.	4295.7	786.0	30	NOV	0545	216	364.	5068.1	790.3
28	NOV	0600	25	4.	4125.4	785.0	29	NOV	0600	121	99.	4300.4	786.1	30	NOV	0600	217	355.	5064.8	790.3
28	NOV	0615	26	4.	4125.7	785.0	29	NOV	0615	122	100.	4305.8	786.1	30	NOV	0615	218	346.	5061.4	790.3
28	NOV	0630	27	5.	4126.1	785.0	29	NOV	0630	123	101.	4312.2	786.1	30	NOV	0630	219	337.	5058.0	790.2
28	NOV	0645	28	5.	4126.6	785.1	29	NOV	0645	124	103.	4319.5	786.2	30	NOV	0645	220	327.	5054.5	790.2
28	NOV	0700	29	5.	4127.1	785.1	29	NOV	0700	125	105.	4328.0	786.2	30	NOV	0700	221	318.	5050.9	790.2
28	NOV	0715	30	5.	4127.7	785.1	29	NOV	0715	126	107.	4337.8	786.3	30	NOV	0715	222	308.	5047.2	790.2
28	NOV	0730	31	6.	4128.4	785.1	29	NOV	0730	127	110.	4348.7	786.3	30	NOV	0730	223	297.	5043.5	790.2
28	NOV	0745	32	6.	4129.1	785.1	29	NOV	0745	128	112.	4360.6	786.4	30	NOV	0745	224	287.	5039.8	790.1
28	NOV	0800	33	7.	4129.8	785.1	29	NOV	0800	129	115.	4373.2	786.5	30	NOV	0800	225	278.	5036.2	790.1
28	NOV	0815	34	7.	4130.5	785.1	29	NOV	0815	130	118.	4386.4	786.6	30	NOV	0815	226	269.	5032.8	790.1
28	NOV	0830	35	7.	4131.2	785.1	29	NOV	0830	131	121.	4400.1	786.6	30	NOV	0830	227	260.	5029.5	790.1
28	NOV	0845	36	8.	4131.9	785.1	29	NOV	0845	132	125.	4414.4	786.7	30	NOV	0845	228	251.	5026.4	790.1
28	NOV	0900	37	8.	4132.7	785.1	29	NOV	0900	133	128.	4429.2	786.8	30	NOV	0900	229	243.	5023.5	790.1
28	NOV	0915	38	9.	4133.4	785.1	29	NOV	0915	134	132.	4444.6	786.9	30	NOV	0915	230	236.	5020.7	790.0
28	NOV	0930	39	9.	4134.0	785.1	29	NOV	0930	135	135.	4460.4	787.0	30	NOV	0930	231	229.	5018.0	790.0
28	NOV	0945	40	9.	4134.7	785.1	29	NOV	0945	136	138.	4476.7	787.1	30	NOV	0945	232	222.	5015.6	790.0
28	NOV	1000	41	10.	4135.4	785.1	29	NOV	1000	137	141.	4493.5	787.2	30	NOV	1000	233	216.	5013.2	790.0
28	NOV	1015	42	10.	4136.1	785.1	29	NOV	1015	138	144.	4510.9	787.3	30	NOV	1015	234	215.	5010.9	790.0
28	NOV	1030	43	11.	4136.7	785.1	29	NOV	1030	139	147.	4528.8	787.4	30	NOV	1030	235	214.	5008.7	790.0
28	NOV	1045	44	11.	4137.4	785.1	29	NOV	1045	140	150.	4547.2	787.5	30	NOV	1045	236	214.	5006.4	790.0
28	NOV	1100	45	11.	4138.1	785.1	29	NOV	1100	141	153.	4566.1	787.6	30	NOV	1100	237	214.	5004.2	790.0
28	NOV	1115	46	12.	4138.7	785.1	29	NOV	1115	142	156.	4585.5	787.7	30	NOV	1115	238	214.	5001.9	789.9
28	NOV	1130	47	12.	4139.3	785.1	29	NOV	1130	143	160.	4605.5	787.8	30	NOV	1130	239	213.	4999.7	789.9
28	NOV	1145	48	12.	4139.9	785.1	29	NOV	1145	144	163.	4626.0	787.9	30	NOV	1145	240	213.	4997.4	789.9
28	NOV	1200	49	13.	4140.6	785.1	29	NOV	1200	145	167.	4647.0	788.0	30	NOV	1200	241	213.	4995.2	789.9
28	NOV	1215	50	13.	4141.2	785.1	29	NOV	1215	146	170.	4668.7	788.1	30	NOV	1215	242	213.	4992.9	789.9

28	NOV	1230	51	13.	4142.0	785.1	*	29	NOV	1230	147	173.	4691.6	788.3	*	30	NOV	1230	243	212.	4990.4	789.9
28	NOV	1245	52	14.	4142.8	785.1	*	29	NOV	1245	148	176.	4716.2	788.4	*	30	NOV	1245	244	212.	4987.8	789.9
28	NOV	1300	53	14.	4143.8	785.2	*	29	NOV	1300	149	180.	4743.1	788.5	*	30	NOV	1300	245	212.	4985.1	789.9
28	NOV	1315	54	15.	4144.8	785.2	*	29	NOV	1315	150	184.	4772.8	788.7	*	30	NOV	1315	246	211.	4982.2	789.8
28	NOV	1330	55	16.	4146.0	785.2	*	29	NOV	1330	151	189.	4805.7	788.9	*	30	NOV	1330	247	211.	4979.1	789.8
28	NOV	1345	56	16.	4147.1	785.2	*	29	NOV	1345	152	194.	4842.4	789.1	*	30	NOV	1345	248	210.	4976.0	789.8
28	NOV	1400	57	17.	4148.3	785.2	*	29	NOV	1400	153	199.	4884.2	789.3	*	30	NOV	1400	249	210.	4972.9	789.8
28	NOV	1415	58	18.	4149.5	785.2	*	29	NOV	1415	154	205.	4931.0	789.6	*	30	NOV	1415	250	210.	4969.7	789.8
28	NOV	1430	59	18.	4150.7	785.2	*	29	NOV	1430	155	211.	4983.7	789.8	*	30	NOV	1430	251	209.	4966.5	789.8
28	NOV	1445	60	19.	4151.9	785.2	*	29	NOV	1445	156	327.	5054.5	790.2	*	30	NOV	1445	252	209.	4963.3	789.7
28	NOV	1500	61	20.	4153.0	785.2	*	29	NOV	1500	157	629.	5166.0	790.8	*	30	NOV	1500	253	208.	4960.1	789.7
28	NOV	1515	62	20.	4154.2	785.2	*	29	NOV	1515	158	1289.	5322.0	791.6	*	30	NOV	1515	254	208.	4957.0	789.7
28	NOV	1530	63	21.	4155.3	785.2	*	29	NOV	1530	159	2264.	5502.7	792.5	*	30	NOV	1530	255	208.	4953.8	789.7
28	NOV	1545	64	22.	4156.4	785.2	*	29	NOV	1545	160	3418.	5685.8	793.4	*	30	NOV	1545	256	207.	4950.7	789.7
28	NOV	1600	65	22.	4157.6	785.2	*	29	NOV	1600	161	4605.	5856.2	794.2	*	30	NOV	1600	257	207.	4947.5	789.6
28	NOV	1615	66	23.	4158.7	785.2	*	29	NOV	1615	162	5649.	5995.4	794.8	*	30	NOV	1615	258	207.	4944.4	789.6
28	NOV	1630	67	23.	4159.7	785.2	*	29	NOV	1630	163	6318.	6080.6	795.2	*	30	NOV	1630	259	206.	4941.3	789.6
28	NOV	1645	68	24.	4160.8	785.3	*	29	NOV	1645	164	6544.	6108.7	795.4	*	30	NOV	1645	260	206.	4938.1	789.6
28	NOV	1700	69	25.	4161.9	785.3	*	29	NOV	1700	165	6434.	6095.0	795.3	*	30	NOV	1700	261	205.	4935.0	789.6
28	NOV	1715	70	25.	4162.9	785.3	*	29	NOV	1715	166	6135.	6057.9	795.1	*	30	NOV	1715	262	205.	4931.9	789.6
28	NOV	1730	71	26.	4164.0	785.3	*	29	NOV	1730	167	5755.	6009.5	794.9	*	30	NOV	1730	263	205.	4928.8	789.5
28	NOV	1745	72	26.	4165.0	785.3	*	29	NOV	1745	168	5355.	5956.2	794.7	*	30	NOV	1745	264	204.	4925.7	789.5
28	NOV	1800	73	27.	4166.0	785.3	*	29	NOV	1800	169	4947.	5901.8	794.4	*	30	NOV	1800	265	204.	4922.6	789.5
28	NOV	1815	74	28.	4167.1	785.3	*	29	NOV	1815	170	4536.	5847.0	794.2	*	30	NOV	1815	266	204.	4919.5	789.5
28	NOV	1830	75	28.	4168.4	785.3	*	29	NOV	1830	171	4147.	5793.2	793.9	*	30	NOV	1830	267	203.	4916.3	789.5
28	NOV	1845	76	29.	4169.9	785.3	*	29	NOV	1845	172	3794.	5741.2	793.7	*	30	NOV	1845	268	203.	4913.1	789.5
28	NOV	1900	77	30.	4171.5	785.3	*	29	NOV	1900	173	3453.	5691.0	793.4	*	30	NOV	1900	269	202.	4909.8	789.4
28	NOV	1915	78	31.	4173.3	785.3	*	29	NOV	1915	174	3127.	5642.8	793.2	*	30	NOV	1915	270	202.	4906.4	789.4
28	NOV	1930	79	32.	4175.3	785.3	*	29	NOV	1930	175	2826.	5597.6	793.0	*	30	NOV	1930	271	201.	4902.9	789.4
28	NOV	1945	80	33.	4177.3	785.3	*	29	NOV	1945	176	2579.	5555.8	792.8	*	30	NOV	1945	272	201.	4899.4	789.4
28	NOV	2000	81	34.	4179.4	785.4	*	29	NOV	2000	177	2352.	5517.5	792.6	*	30	NOV	2000	273	201.	4895.9	789.4
28	NOV	2015	82	36.	4181.5	785.4	*	29	NOV	2015	178	2146.	5482.7	792.4	*	30	NOV	2015	274	200.	4892.4	789.4
28	NOV	2030	83	37.	4183.6	785.4	*	29	NOV	2030	179	1960.	5451.4	792.2	*	30	NOV	2030	275	200.	4888.9	789.3
28	NOV	2045	84	38.	4185.7	785.4	*	29	NOV	2045	180	1794.	5423.2	792.1	*	30	NOV	2045	276	199.	4885.4	789.3
28	NOV	2100	85	39.	4187.7	785.4	*	29	NOV	2100	181	1649.	5397.9	792.0	*	30	NOV	2100	277	199.	4881.9	789.3
28	NOV	2115	86	40.	4189.8	785.4	*	29	NOV	2115	182	1539.	5374.9	791.9	*	30	NOV	2115	278	198.	4878.4	789.3
28	NOV	2130	87	41.	4191.8	785.4	*	29	NOV	2130	183	1439.	5353.7	791.8	*	30	NOV	2130	279	198.	4875.0	789.3
28	NOV	2145	88	43.	4193.8	785.4	*	29	NOV	2145	184	1348.	5334.3	791.7	*	30	NOV	2145	280	198.	4871.5	789.2
28	NOV	2200	89	44.	4195.7	785.5	*	29	NOV	2200	185	1263.	5316.5	791.6	*	30	NOV	2200	281	197.	4868.0	789.2
28	NOV	2215	90	45.	4197.7	785.5	*	29	NOV	2215	186	1185.	5300.1	791.5	*	30	NOV	2215	282	197.	4864.6	789.2
28	NOV	2230	91	46.	4199.6	785.5	*	29	NOV	2230	187	1114.	5285.1	791.4	*	30	NOV	2230	283	196.	4861.1	789.2
28	NOV	2245	92	47.	4201.5	785.5	*	29	NOV	2245	188	1049.	5271.2	791.3	*	30	NOV	2245	284	196.	4857.7	789.2
28	NOV	2300	93	48.	4203.4	785.5	*	29	NOV	2300	189	988.	5258.5	791.3	*	30	NOV	2300	285	195.	4854.3	789.2
28	NOV	2315	94	49.	4205.2	785.5	*	29	NOV	2315	190	933.	5246.8	791.2	*	30	NOV	2315	286	195.	4850.9	789.1
28	NOV	2330	95	50.	4207.1	785.5	*	29	NOV	2330	191	882.	5236.0	791.2	*	30	NOV	2330	287	195.	4847.5	789.1
28	NOV	2345	96	51.	4208.9	785.5	*	29	NOV	2345	192	835.	5226.1	791.1	*	30	NOV	2345	288	194.	4844.1	789.1
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	71.75-HR
+ (CFS)	(HR)					
		(CFS)				
+ 6544.	40.75		3883.	1334.	502.	502.
		(INCHES)	22.287	30.632	34.427	34.427
		(AC-FT)	1926.	2647.	2975.	2975.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	71.75-HR
+ (AC-FT)	(HR)				
6109.	40.75	5739.	5258.	4673.	4673.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE

+ (FEET)	(HR)	6-HR	24-HR	72-HR	71.75-HR
795.37	40.75	793.63	791.23	788.07	788.07

CUMULATIVE AREA = 1.62 SQ MI

1 STATION IN-FNI

(I) INFLOW, (O) OUTFLOW

	0.	2000.	4000.	6000.	8000.	10000.	12000.	14000.	0.	0.	0.	0.	0.

(S) STORAGE

	0.	0.	0.	0.	0.	0.	4000.	4500.	5000.	5500.	6000.	6500.	0.

DAHRMN	PER	
280000	1I	S
280015	2I	S
280030	3I	S
280045	4I	S
280100	5I	S
280115	6I	S
280130	7I	S
280145	8I	S
280200	9I	S
280215	10I	S
280230	11I	S
280245	12I	S
280300	13I	S
280315	14I	S
280330	15I	S
280345	16I	S
280400	17I	S
280415	18I	S
280430	19I	S
280445	20I	S
280500	21I	S
280515	22I	S
280530	23I	S
280545	24I	S
280600	25I	S
280615	26I	S
280630	27I	S
280645	28I	S
280700	29I	S
280715	30I	S
280730	31I	S
280745	32I	S
280800	33I	S
280815	34I	S
280830	35I	S
280845	36I	S
280900	37I	S
280915	38I	S
280930	39I	S
280945	40I	S
281000	41I	S
281015	42I	S
281030	43I	S
281045	44I	S
281100	45I	S
281115	46I	S
281130	47I	S
281145	48I	S
281200	49I	S
281215	50I	S

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281230   51I . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
281245   52I          .         .         .         .         .         . S       .         .         .         .         .         .
281300   53I          .         .         .         .         .         . S       .         .         .         .         .         .
281315   54I          .         .         .         .         .         . S       .         .         .         .         .         .
281330   55I          .         .         .         .         .         . S       .         .         .         .         .         .
281345   56I          .         .         .         .         .         . S       .         .         .         .         .         .
281400   57I          .         .         .         .         .         . S       .         .         .         .         .         .
281415   58I          .         .         .         .         .         . S       .         .         .         .         .         .
281430   59I          .         .         .         .         .         . S       .         .         .         .         .         .
281445   60I          .         .         .         .         .         . S       .         .         .         .         .         .
281500   61I . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
281515   62I          .         .         .         .         .         . S       .         .         .         .         .         .
281530   63I          .         .         .         .         .         . S       .         .         .         .         .         .
281545   64I          .         .         .         .         .         . S       .         .         .         .         .         .
281600   65I          .         .         .         .         .         . S       .         .         .         .         .         .
281615   66I          .         .         .         .         .         . S       .         .         .         .         .         .
281630   67I          .         .         .         .         .         . S       .         .         .         .         .         .
281645   68I          .         .         .         .         .         . S       .         .         .         .         .         .
281700   69I          .         .         .         .         .         . S       .         .         .         .         .         .
281715   70I          .         .         .         .         .         . S       .         .         .         .         .         .
281730   71I . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
281745   72I          .         .         .         .         .         . S       .         .         .         .         .         .
281800   73I          .         .         .         .         .         . S       .         .         .         .         .         .
281815   74I          .         .         .         .         .         . S       .         .         .         .         .         .
281830   75I          .         .         .         .         .         . S       .         .         .         .         .         .
281845   76OI         .         .         .         .         .         . S       .         .         .         .         .         .
281900   77OI         .         .         .         .         .         . S       .         .         .         .         .         .
281915   78OI         .         .         .         .         .         . S       .         .         .         .         .         .
281930   79OI         .         .         .         .         .         .  S      .         .         .         .         .         .
281945   80OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282000   81OI. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
282015   82OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282030   83OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282045   84OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282100   85OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282115   86OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282130   87OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282145   88OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282200   89OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282215   90OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282230   91OI. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
282245   92OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282300   93OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282315   94OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282330   95OI         .         .         .         .         .         .  S      .         .         .         .         .         .
282345   96OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290000   97OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290015   98OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290030   99OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290045  100OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290100  101OI. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
290115  102OI         .         .         .         .         .         .  S      .         .         .         .         .         .
290130  103OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290145  104OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290200  105OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290215  106OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290230  107OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290245  108OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290300  109OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290315  110OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290330  111OI. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
290345  112OI         .         .         .         .         .         .   S     .         .         .         .         .         .
290400  113OI         .         .         .         .         .         .   S     .         .         .         .         .         .
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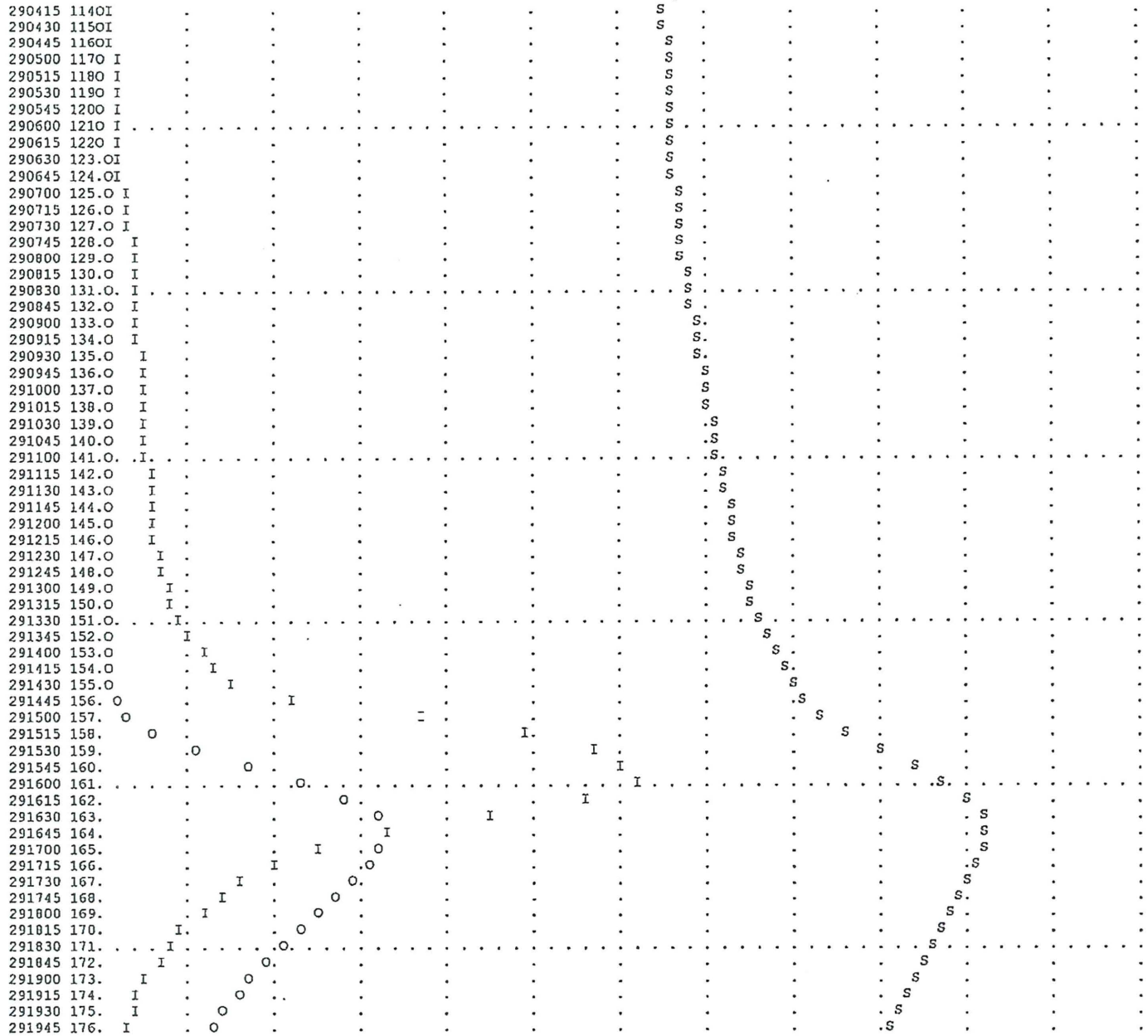
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290530 1190 I
290545 1200 I
290600 1210 I
290615 1220 I
290630 123.0I
290645 124.0I
290700 125.0 I
290715 126.0 I
290730 127.0 I
290745 128.0 I
290800 129.0 I
290815 130.0 I
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290900 133.0 I
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291100 141.0. .I.
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291145 144.0 I
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291230 147.0 I
291245 148.0 I
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291345 152.0 I
291400 153.0 I
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291445 156. O I
291500 157. O
291515 158. O I.
291530 159. .O I
291545 160. O I
291600 161. .O. I
291615 162. O I
291630 163. O I
291645 164. I
291700 165. I O
291715 166. I O
291730 167. I O
291745 168. I O
291800 169. I O
291815 170. I. O
291830 171. . . . I .O.
291845 172. I O.
291900 173. I O
291915 174. I O
291930 175. I O
291945 176. I O

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292000 177.  I      . O       .         .         .         .         .         .         .         S         .         .         .
292015 178.  I      .O        .         .         .         .         .         .         .         S         .         .         .
292030 179.  I      O         .         .         .         .         .         .         .        S.         .         .         .
292045 180.  I     O.         .         .         .         .         .         .         .       S .         .         .         .
292100 181. I . . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S . . . . . . . . . . . . . . . . .
292115 182. I     O .         .         .         .         .         .         .         .      S  .         .         .         .
292130 183. I    O  .         .         .         .         .         .         .         .      S  .         .         .         .
292145 184. I    O  .         .         .         .         .         .         .         .      S  .         .         .         .
292200 185. I   O   .         .         .         .         .         .         .         .     S   .         .         .         .
292215 186. I   O   .         .         .         .         .         .         .         .     S   .         .         .         .
292230 187. I   O   .         .         .         .         .         .         .         .     S   .         .         .         .
292245 188. I  O    .         .         .         .         .         .         .         .    S    .         .         .         .
292300 189. I  O    .         .         .         .         .         .         .         .    S    .         .         .         .
292315 190. I  O    .         .         .         .         .         .         .         .    S    .         .         .         .
292330 191. I O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . .
292345 192. I O     .         .         .         .         .         .         .         .    S    .         .         .         .
300000 193. I O     .         .         .         .         .         .         .         .   S     .         .         .         .
300015 194. I O     .         .         .         .         .         .         .         .   S     .         .         .         .
300030 195. I O     .         .         .         .         .         .         .         .   S     .         .         .         .
300045 196.I O      .         .         .         .         .         .         .         .   S     .         .         .         .
300100 197.I O      .         .         .         .         .         .         .         .   S     .         .         .         .
300115 198.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300130 199.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300145 200.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300200 201.I.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . .
300215 202.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300230 203.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300245 204.I O      .         .         .         .         .         .         .         .  S      .         .         .         .
300300 205.I O      .         .         .         .         .         .         .         . S       .         .         .         .
300315 206.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300330 207.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300345 208.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300400 209.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300415 210.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300430 211.IO . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S . . . . . . . . . . . . . . . . . . .
300445 212.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300500 213.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300515 214.IO       .         .         .         .         .         .         .         . S       .         .         .         .
300530 215.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300545 216.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300600 217.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300615 218.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300630 219.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300645 220.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300700 221.IO . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .S. . . . . . . . . . . . . . . . . . . .
300715 222.IO       .         .         .         .         .         .         .         .S        .         .         .         .
300730 223.I        .         .         .         .         .         .         .         .S        .         .         .         .
300745 224.I        .         .         .         .         .         .         .         .S        .         .         .         .
300800 225.I        .         .         .         .         .         .         .         .S        .         .         .         .
300815 226.I        .         .         .         .         .         .         .         .S        .         .         .         .
300830 227.I        .         .         .         .         .         .         .         .S        .         .         .         .
300845 228.I        .         .         .         .         .         .         .         .S        .         .         .         .
300900 229.I        .         .         .         .         .         .         .         S         .         .         .         .
300915 230.I        .         .         .         .         .         .         .         S         .         .         .         .
300930 231.I. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . S . . . . . . . . . . . . . . . . . . . .
300945 232.I        .         .         .         .         .         .         .         S         .         .         .         .
301000 233.I        .         .         .         .         .         .         .         S         .         .         .         .
301015 234.I        .         .         .         .         .         .         .         S         .         .         .         .
301030 235.I        .         .         .         .         .         .         .         S         .         .         .         .
301045 236.I        .         .         .         .         .         .         .         S         .         .         .         .
301100 237.I        .         .         .         .         .         .         .         S         .         .         .         .
301115 238.I        .         .         .         .         .         .         .         S         .         .         .         .
301130 239.I        .         .         .         .         .         .         .         S         .         .         .         .
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301145 240.I        .         .         .         .         .         .         S         .         .         .         .
301200 241.I. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
301215 242IO        .         .         .         .         .         .         S         .         .         .         .
301230 243IO        .         .         .         .         .         .         S         .         .         .         .
301245 244IO        .         .         .         .         .         .         S         .         .         .         .
301300 245IO        .         .         .         .         .         .         S         .         .         .         .
301315 246IO        .         .         .         .         .         .         S         .         .         .         .
301330 247IO        .         .         .         .         .         .         S         .         .         .         .
301345 248IO        .         .         .         .         .         .         S         .         .         .         .
301400 249IO        .         .         .         .         .         .         S.        .         .         .         .
301415 250IO        .         .         .         .         .         .         S.        .         .         .         .
301430 251IO. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
301445 252IO        .         .         .         .         .         .         S.        .         .         .         .
301500 253IO        .         .         .         .         .         .         S.        .         .         .         .
301515 254IO        .         .         .         .         .         .         S.        .         .         .         .
301530 255IO        .         .         .         .         .         .         S.        .         .         .         .
301545 256IO        .         .         .         .         .         .         S.        .         .         .         .
301600 257IO        .         .         .         .         .         .         S.        .         .         .         .
301615 258IO        .         .         .         .         .         .         S.        .         .         .         .
301630 259IO        .         .         .         .         .         .         S.        .         .         .         .
301645 260IO        .         .         .         .         .         .         S.        .         .         .         .
301700 261IO. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
301715 262IO        .         .         .         .         .         .         S.        .         .         .         .
301730 263IO        .         .         .         .         .         .         S.        .         .         .         .
301745 264IO        .         .         .         .         .         .         S.        .         .         .         .
301800 265IO        .         .         .         .         .         .         S .       .         .         .         .
301815 266IO        .         .         .         .         .         .         S .       .         .         .         .
301830 267IO        .         .         .         .         .         .         S .       .         .         .         .
301845 268IO        .         .         .         .         .         .         S .       .         .         .         .
301900 269IO        .         .         .         .         .         .         S .       .         .         .         .
301915 270IO        .         .         .         .         .         .         S .       .         .         .         .
301930 271IO. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
301945 272IO        .         .         .         .         .         .         S .       .         .         .         .
302000 273IO        .         .         .         .         .         .         S .       .         .         .         .
302015 274IO        .         .         .         .         .         .         S .       .         .         .         .
302030 275IO        .         .         .         .         .         .         S .       .         .         .         .
302045 276IO        .         .         .         .         .         .         S .       .         .         .         .
302100 277IO        .         .         .         .         .         .         S .       .         .         .         .
302115 278IO        .         .         .         .         .         .         S .       .         .         .         .
302130 279IO        .         .         .         .         .         .         S  .      .         .         .         .
302145 280IO        .         .         .         .         .         .         S  .      .         .         .         .
302200 281IO. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
302215 282IO        .         .         .         .         .         .         S  .      .         .         .         .
302230 283IO        .         .         .         .         .         .         S  .      .         .         .         .
302245 284IO        .         .         .         .         .         .         S  .      .         .         .         .
302300 285IO        .         .         .         .         .         .         S  .      .         .         .         .
302315 286IO        .         .         .         .         .         .         S  .      .         .         .         .
302330 287IO        .         .         .         .         .         .         S  .      .         .         .         .
302345 288IO--------.---------.---------.---------.---------.---------.---------.------S--.---------.---------.---------.---------.
1
1
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	PRECIP	11856.	4C.00	4203.	1401.	505.	1.35		
	HYDROGRAPH AT									

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+                    LAKE        3808.   39.25        868.       299.       119.        .27

        2 COMBINED AT
+                    INFLOW     12454.   40.00       5055.      1700.       624.       1.62

        ROUTED TO
+                    IN-FNI      6544.   40.75       3883.      1334.       502.       1.62
+.                                                                                   795.37       40.75

 *** NORMAL END OF HEC-1 ***
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1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    20MAR01    TIME   15:17:11 *
 *****************************************
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*************************************
 *  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     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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20MAR01 15:17:11 PAGE 1

THIS RUN EXECUTED 20MAR01 15:17:11

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

 Version   4.6.2;  May 1991
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T2        10 AND 100YEARFREQUENCY   FLOOD
T3      PALUXY RIVER RGW

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

     -1        2                           .0032                                   591.80

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1                  -1


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43        1         50        51        10        2         42        57        5
     53        54        0         38        43        1         50        51        10        2
     42        41        40        53        54        4

QT        2      30000     81000

NC     .060      .085      .045       .1        .3
         LOB GLENROSE TOPO MAP DIGITIZED X-SEC #7  PHOTOS FLOWN 3/14/92
X1    11710        54      3269      3471      1050      1130      1090
GR    628.0       340     626.0       390     624.0       560     622.0       780     622.0      1030
GR    620.0      1260     620.0      1370     618.0      1720     616.0      1910     614.8     2000.0
GR    614.8    2001.0     614.0    2082.0     613.3    2121.0     613.7    2137.0     613.4     2151.0
GR    612.4    2170.0     611.2    2196.0     610.4    2255.0     609.0    2306.0     607.7     2347.0
GR    607.4    2391.0     606.0    2422.0     604.3    2442.0     603.2    2458.0     602.6     2490.0
GR    601.3    2516.0     599.9    2530.0     599.9    2598.0     601.7    2602.0     602.4     2621.0
GR    600.6    2632.0     600.6    2671.0     600.9    2692.0     603.8    2708.0     606.3     2728.0
GR    607.0    2764.0     608.1    2833.0     609.0    2920.0     609.5    3012.0     610.4     3089.0
GR    609.2    3195.0     609.0    3259.0     606.5    3269.0     592.6    3285.0     589.5     3303.0
GR    586.2    3352.0     584.7    3352.0     584.9    3394.0     585.3    3435.0     586.2     3435.0
GR    593.9    3442.0     600.9    3471.0     636.2    3497.0     648.8    3524.0

NC     .060      .075      .045       .3        .5
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          OLD FILL IN LEFT OVERBANK GLENROSE 2' TOPO X-SEC
X1    12340        36      2880      3120       525       700       630
GR    630.0       680     628.0       790     526.0      1110     624.0      1220     622.0      1460
GR    620.0      1620     618.0      1770     516.0      1910     614.0      1980     612.0      2020
GR    612.0      2140     614.0      2500     514.8      2640     614.0      2840     612.0      2860
GR    610.0      2880     600.0      2900     599.9    2924.0     596.9    2940.0     593.2    2956.0
GR    592.8    2984.0     591.4    2998.0     589.1    3011.0     587.1    3016.0     585.6    3016.0
GR    585.3    3056.0     586.6    3097.0     587.1    3097.0     590.1    3107.0     610.0      3120
GR    612.0      3125     614.0      3290     516.0      3380     618.0      3410     620.0      3430
GR    630.0      3465

NC     .060      .050      .045        .3        .5
X1    13492        37      1490      1914      1082      1143      1152
GR      630      1000       628      1048       626      1082       624      1122       622      1169
GR      620      1244       618      1324       616      1393       614      1437       612      1446
GR      610      1449       610      1490       608      1503       600      1518       590      1534
GR    587.4      1544     587.4      1619       590      1638       598      1666       598      1720
GR      598      1725       598      1737       598      1742       598      1752       598      1762
GR      598      1866       610      1914       612      1929       614      1950       616      2012
GR    616.5      2135     616.5      2348       616      2547       616      2792       618      2833
GR      620      2841       630      2889

NC     .060      .050      .035        .2        .4
X1    13574        32      1429      1853        50        50        82
GR      630      1000       628      1039       626      1068       624      1110       622      1153
GR      620      1230       618      1315       616      1341       614      1368       610      1375
GR      610      1382       610      1423       608      1429       600      1445       600      1475
GR      598      1485       598      1555       600      1565       600      1584       600      1601
GR      600      1724       600      1821       610      1853       612      1873       614      1903
GR      616      1962     616.5      2034     616.8      2257     616.2      2671       618      2784
GR      620      2807       630      2861

NC     .060      .050      .035        .2        .4
X1    13622        34      1388      1821        40        40        48
GR      630      1000       628      1041       626      1070       624      1108       622      1150
GR      620      1226       618      1283       616      1305       614      1327       612      1332
GR      610      1338       610      1383       608      1388       600      1404       590      1424
GR    587.6      1470       590      1512       600      1540       602      1548       602      1643
GR      602      1665       602      1789       610      1821       612      1844       614      1874
GR      616      1926     617.9      2078       618      2231       618      2266     617.5      2562
GR      618      2712       620      2784       622      2817       630      2847

NC     .060      .060      .035        .1        .3
          LOB GLENROSE TOPO MAP DIGITIZED X-SEC #9  PHOTOS FLOWN 3/14/92
X1    13790        35       990      1465       288        37       168
GR      632       710       630       740       628       780       626       796       624       810
GR      622       825       620       854       618       875       616       897       614       922
GR      612       977       610       990       608      1007       606      1016       600      1040
GR      592      1061       590      1062       588      1110       590      1155       592      1156
GR      600      1184       603      1196       603      1437       610      1465       612      1483
GR      614      1516       616      1571       618      1702       618      1965       618      2308
GR      620      2434       622      2467       624      2480       630      2510       640      2527

NC     .055      .055      .045        .1        .3
          DIGITIZED X-SEC #10 PHOTOS FLOWN 3/14/92
X1    14970        58      1627      1919      1180      1180      1180
GR    649.3      1000     649.0      1052     648.2      1084     640.0      1122     638.5      1146
GR    637.3      1160     628.6      1168     626.2      1186     621.5      1188     620.5      1197
GR    620.8      1206     620.7      1236     618.8      1244     617.5      1266     616.1      1334
GR    613.3      1405     613.0      1473     610.8      1555     610.7      1627     610.2      1637
GR    607.0      1654     604.4      1674     602.4      1686     598.0      1694     593.4      1703
GR    592.8      1703     592.4      1758     592.6      1811     593.4      1811     594.4      1825
GR    597.4      1834     602.2      1853     608.4      1889     608.4      1914     609.9      1919
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                                                                                  602q603
GR     613.3       1952       619.9       1987       620.8       2011       620.6       2070       621.8       2142
GR     622.8       2264       623.7       2339       625.4       2416       627.5       2505       629.3       2524
GR     630.8       2545       631.0       2564       632.2       2587       634.4       2646       638.3       2739
GR     639.9       2778       641.8       2842       645.0       2942       647.4       3039       649.1       3151
GR     651.2       3248       653.6       3375       656.3       3469

          GLENROSE CITY 2' TOPO SECTION FLOWN 3/14/92
X1    15680         49       1888       2045        710        710        710
GR     640.0       1020       638.0       1030       636.0       1040       634.0       1055       632.0       1070
GR     630.0       1083       628.0       1110       626.0       1130       624.0       1160       622.0       1225
GR     620.0       1275       618.0       1360       616.0       1610       614.0       1705       612.0       1825
GR     610.0       1845       608.0       1855       606.0       1860       604.0       1868       602.0       1877
GR     600.0       1888       598.0       1905       596.0       1955       594.5       1970       594.4       2000
GR     594.5       2030       596.0       2040       598.0       2045       600.0       2045       602.0       2050
GR     604.0       2057       606.0       2062       608.0       2065       610.0       2070       612.0       2082
GR     614.0       2090       616.0       2100       618.0       2112       620.0       2118       622.0       2135
GR     624.0       2138       626.0       2155       628.0       2200       630.0       2303       632.0       2345
GR     634.0       2380       636.0       2627       638.0       2690       640.0       2760

NC      .060       .060       .045         .1         .3
          GLENROSE CITY 2' TOPO SECTION FLOWN 3/14/92
          CHANNEL FROM SECTION P5 DATE: 6/10/66  SOURCE:COE,SURVEY
X1    16140         48       1935       2085        530        400        460
GR     640.0        890       638.0        900       636.0        910       634.0        915       632.0        935
GR     630.0       1000       628.0       1020       626.0       1085       624.0       1200       622.6       1290
GR     622.0       1320       620.0       1420       619.5       1490       618.0       1560       616.0       1682
GR     614.0       1870       612.0       1885       610.0       1900       608.0       1910       606.0       1920
GR     604.0       1922       602.0       1927       600.0       1935       598.0       1944       595.8       1960
GR     595.7       2000       595.8       2070       598.0       2080       600.0       2085       602.0       2090
GR     604.0       2100       606.0       2108       608.0       2122       610.0       2140       612.0       2148
GR     614.0       2155       616.0       2160       618.0       2170       620.0       2178       622.0       2182
GR     624.0       2190       628.0       2195       630.0       2275       634.0       2345       636.0       2385
GR     638.0       2440       638.0       2710       640.0       2760
   20MAR01      15:17:11                                                                                   PAGE   39


                                                                    THIS RUN EXECUTED 20MAR01    15:17:12
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 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST


PALUXY RIVER RGW

SUMMARY PRINTOUT


      SECNO        Q        CWSEL    DIFWSP    DIFWSX      HV       CRIWS     ELMIN     ALPHA     10*KS     SSTA      ENDST

   11710.000  30000.00    605.72       .00      2.25       .91       .00     584.70      1.34     15.34   2425.15   3474.56
   11710.000  81000.00    615.34      9.61      1.85       .82       .00     584.70      1.76     10.50   1959.82   3481.63

   12340.000  30000.00    606.70       .00       .98      1.21       .00     585.30      1.00     21.63   2886.60   3117.84
*  12340.000  81000.00    615.35      8.65       .01      2.81    607.70     585.30      1.65     30.07   1932.48   3351.09

*  13492.000  30000.00    609.22       .00      2.52       .47       .00     587.40      1.00      9.15   1495.09   1910.87
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*	13492.000	81000.00	619.57	10.35	4.22	.76	.00	587.40	1.47	7.68	1260.91	2839.31
*	13574.000	30000.00	609.01	.00	-.21	.99	.00	598.00	1.00	19.30	1425.97	1849.84
	13574.000	81000.00	619.41	10.40	-.16	1.13	.00	598.00	1.56	8.68	1254.92	2800.26
	13622.000	30000.00	609.46	.00	.45	.67	.00	587.60	1.00	10.42	1384.34	1818.86
	13622.000	81000.00	619.56	10.10	.15	1.03	.00	587.60	1.43	7.11	1238.52	2768.19
	13790.000	30000.00	609.66	.00	.19	.66	.00	588.00	1.00	11.41	992.90	1463.63
	13790.000	81000.00	619.74	10.08	.13	.98	.00	588.00	1.43	7.01	856.72	2417.67
*	14970.000	30000.00	611.27	.00	1.61	1.20	.00	592.40	1.03	27.53	1537.40	1932.32
*	14970.000	81000.00	620.61	9.34	.87	1.58	.00	592.40	1.32	19.30	1196.02	2070.51
	15680.000	30000.00	612.84	.00	1.55	1.47	.00	594.40	1.14	22.34	1774.85	2085.34
	15680.000	81000.00	621.74	8.91	1.13	2.07	.00	594.40	1.61	22.48	1231.43	2132.81
	16140.000	30000.00	613.89	.00	1.05	1.41	.00	595.70	1.20	20.19	1870.86	2154.60
	16140.000	81000.00	622.72	8.83	.97	2.20	.00	595.70	1.71	22.68	1282.93	2184.84

APPENDIX E

DETAILED COST ESTIMATES

APPENDIX E

COST ESTIMATES

Cost estimates were developed for the Somervell County project and include the diversion dam on the Paluxy River, the pump station on the Paluxy, the Wheeler Branch reservoir, and the pipeline from the pump station to the Wheeler Branch reservoir. All costs are given in 2000 dollars. Costs for potential mitigation requirements are not included. A breakdown of the estimated construction costs, including a 15 percent allowance for technical services is provided in the following tables (Note: technical services were estimated at 20 per cent for roadway design). Contingencies were estimated at 15 percent for the Wheeler dam and pipeline, 50 percent for land acquisition, and 20 percent for the pump station and channel dam. A summary of the probable costs for the Somervell County project is presented below. Detailed cost estimates are presented in Tables E-2 through E-7.

Table E-1
Summary of Probable Costs for Somervell Project

Item	Estimated Cost
Permitting and Archeology	$500,000
Land Acquisition	$888,800
Wheeler Branch Dam and Spillway	$9,496,000
Conflict Resolution	$379,500
Paluxy Diversion Dam	$1,351,000
Pump Station and Intake	$2,557,500
Pipeline to Wheeler Branch Reservoir	$1,583,000
Total for Raw Water	**$16,755,800**
Water Treatment Plant (1 MGD Initially)	$4,150,000
Total for Treated Water at Plant	**$20,905,800**

Table E-2
Opinion of Probable Costs for Paluxy River Pump Station
-2000 Dollars-

Item	Quantity	Unit	Unit Cost	Cost
Mobilization	1	LS	$95,000	$95,000
Care of water	1	LS	$57,500	$57,500
Excavation	4,000	CY	$20	$80,000
Concrete	750	CY	$400	$300,000
Pumps (7,500 gpm)	3	EA	$115,000	$345,000
Intake Structure	1	EA	$29,000	$29,000
Intake Pipe/Boring	150	LF	$860	$129,000
Electrical	1	LS	$287,500	$287,500
Building	1,000	SF	$140	$140,000
Crane	1	LS	$17,000	$17,000
Sitework	1	LS	$115,000	$115,000
Valves/HDR	1	LS	$57,500	$57,500
Variable Frequency Drive	1	LS	$100,000	$100,000
Miscellaneous	1	LS	$100,000	$100,000
SUBTOTAL				$1,852,500
Contingencies @ 20%				$371,000
SUBTOTAL				$2,223,500
Technical Services @ 15%				$334,000
TOTAL				**$2,557,500**

Table E-3
Opinion of Probable Cost of Channel Dam
on Paluxy River and Related Facilities
-2000 Dollars-

Item	Quantity	Unit	Unit Cost	Cost
Mobilization	1	LS	$47,000	$47,000
Care of Water	1	LS	$125,000	$125,000
Site Work (Grading)	9,000	CY	$5	$45,000
Anchors	8	EA	$900	$7,000
Trench	140	LF	$180	$25,000
Channel Dam (re-inforced concrete)	2,170	CY	$250	$543,000
Stilling Basin	311	CY	$400	$124,000
Low Flow Outlet	1	LS	$29,000	$29,000
Seeding	1,400	SY	$1	$2,000
Excavation	1,037	CY	$20	$21,000
Miscellaneous	1	LS	$10,000	$10,000
SUBTOTAL				$978,000
Contingencies @ 20%				$196,000
SUBTOTAL				$1,174,000
Technical Services @ 15%				$177,000
TOTAL				**$1,351,000**

Table E-4
Opinion of Probable Cost of Wheeler Branch Reservoir
Dam and Related Facilities
-2000 Dollars-

Item	Quantity	Unit	Unit Cost	Cost
Mobilization	1	LS	$342,000	$342,000
Diversion and Care of Water	1	LS	$60,000	$60,000
Clear and Grub	20	AC	$1,200	$24,000
Random Fill	610,000	CY	$3	$1,830,000
Impervious Core	200,000	CY	$7	$1,400,000
Sand Column	11,000	CY	$35	$385,000
Internal Drainage	1,500	LF	$70	$105,000
Spillway	1	LS	$250,000	$250,000
Soil Cement	19,000	CY	$60	$1,140,000
Grout Curtain	100,000	SF	$5	$500,000
Seeding	4	AC	$4,000	$16,000
Erosion Control	1	LS	$30,000	$30,000
Flex base Road Material (8")	4,300	SY	$10	$43,000
Access Road	13,600	LF	$50	$680,000
Instrumentation	1	LS	$75,000	$75,000
Low Flow Outlet and Intake Tower	1	LS	$300,000	$300,000
SUBTOTAL				$7,180,000
Contingencies @ 15%				$1,077,000
SUBTOTAL				$8,257,000
Technical Services @ 15%				$1,239,000
TOTAL				**$9,496,000**

Table E-5
Opinion of Probable Cost of Pipeline
to Wheeler Branch Reservoir
-2000 Dollars-

Item	Quantity	Unit	Unit Cost	Cost
Mobilization	1	LS	$60,000	$60,000
Pipeline (36 in):				
Urban	4100	LF	$125	$513,000
Rural	6230	LF	$100	$623,000
SUBTOTAL				$1,196,000
Contingencies @ 15%				$180,000
SUBTOTAL				$1,376,000
Technical Services @ 15%				$207,000
TOTAL				**$1,583,000**

Table E-6
Opinion of Probable Cost of Conflict Resolutions
-2000 Dollars-

New State Roadway (1,700 feet)	Quantity	Unit	Unit Cost	Cost
Grading				
Unclassified Excavation/Fill	3,530	C.Y.	$5	$17,700
Seeding	4,820	S.Y.	$1	$4,900
Drainage				
Roadway Ditch Grading (Excavation)	4,560	C.Y.	$5	$22,800
Driveway Culverts 24"	50	L.F.	$50	$2,500
Driveway End Treatments	4	EA.	$500	$2,000
Erosion Control	1	L.S.	$3,000	$3,000
Drainage Culvert	2	EA.	$25,000	$50,000
Paving				
Mobilization	1	L.S.	$10,000	$10,000
7-Inch Asphalt Pavement (24Ft)	4,560	S.Y.	$20	$91,200
Lime Stabilized Subgrade	5,040	S.Y.	$1.50	$7,600
Hydrated Lime	80	TON	$85	$6,800
Striping/Pavement Markings	4,240	L.F.	$0.25	$1,100
Traffic Control	1	L.S.	$4,000	$4,000
Private Roadway (1,500 feet)				
Mobilization	1	L.S.	$2,500	$2,500
Grading	1,500	C.Y.	$5	$7,500
Subgrade	2,500	S.Y.	$1.50	$3,800
Gravel road	2,500	S.Y.	$15	$37,500
SUBTOTAL				$274,900
Contingencies @ 15%				$41,300
SUBTOTAL				$316,200
Technical Services @ 20%				$63,300
TOTAL				**$379,500**

Table E-7
Opinion of Probable Cost of Land Aquisition
for Wheeler Branch Reservoir
-2000 Dollars-

Item	Quantity	Unit	Unit Cost	Cost
Land purchase	237	AC	$2,500	$592,500
Fees and Contingency @ 50%				$296,300
Total				**$888,800**

APPENDIX F

SUBORDINATION AGREEMENT
WITH BRAZOS RIVER AUTHORITY

SUBORDINATION AGREEMENT

This Subordination Agreement ("Agreement") is entered into as of the 16th day of October 2000, between Brazos River Authority ("Authority"), and Somervell County Water District ("District").

RECITALS

Previously the City of Stephenville, City of Glen Rose, and Somervell County applied for and were granted Water Right Permit 4302 for an on-channel reservoir in the Paluxy River ("Paluxy Reservoir") with a permitted capacity of 99,674 acre-feet and an annual diversion of 12,950 acre-feet. Authority agreed to subordinate its water right in Lake Whitney, Certificate of Adjudication 12-5157, to Water Right Permit 4302. District was created to succeed the City's and County's interests in said permit. The Texas Natural Resource Conservation Commission (TNRCC) subsequently revoked Water Right Permit 4302. District now desires to apply for a water right permit from the TNRCC authorizing District to divert and use the flows from Paluxy River upstream of Lake Whitney into a smaller, off-channel reservoir in lieu of construction of and diversion from Paluxy Reservoir. This smaller off-channel reservoir will have less impact on Authority's water right in Lake Whitney than Paluxy Reservoir. District desires that Authority affirm its approval to subordinate its water right in Lake Whitney to make water available for use by District and District's permit at times when the flow would otherwise be required to pass downstream to honor Authority's senior water right.

AGREEMENT

NOW, THEREFORE, for and in consideration of the mutual promises, obligations, and benefits hereinafter set forth, Authority and District agree as follows:

1. District proposes to apply for a water right permit to divert a maximum annual volume of 5,000 acre-feet of water from the Paluxy River, with an approximate average annual diversion of 3,000 acre-feet, into an off-channel reservoir that, at maximum operating level, contains approximately 8,000 acre-feet and to divert an average annual volume of 2,000 acre-feet from said off-channel reservoir for municipal purposes in Somervell County, Texas.

2. The Authority agrees to subordinate its water right in Lake Whitney under Certificate of Adjudication 12-5157 to the extent necessary to make water available for use as proposed by District at times when the flow would otherwise be required to pass downstream to honor the Authority's water right.

3. The approximate location of the proposed off-channel reservoir is more fully described in a map which is a part of this Agreement and is attached hereto as Exhibit A. District shall provide Authority with more detailed map of its reservoir site prior to construction of the reservoir.

4. The effectiveness of this Agreement is dependent upon compliance with applicable rules of the TNRCC, if any. This Agreement is subject to the terms of Authority's water right and regulations as may be applicable to similar agreements in the State of Texas.

5. Authority makes no representations and shall have no responsibility with respect to the availability or quality of water, except as specifically provided herein, to satisfy District's rights to said water. District understands and agrees that Authority may subordinate its water rights to other rights held by Authority and others. This Agreement shall not be construed as an Agreement for the benefit of a third party.

6. District may terminate this Agreement at any time upon giving Authority written notice of termination at least thirty (30) days prior to the date of termination.

7. Authority is subordinating its water right only to the extent needed for the off-channel reservoir and diversions described in Paragraph 1, above. Authority may terminate this Agreement upon 30 days notice if District constructs or operates diversion facilities which exceed the amounts described in Paragraph 1, above.

8. This Agreement shall extend for a term of fifty (50) years from the date first set forth above unless earlier terminated pursuant to the terms hereof. Upon expiration of said term, this Agreement may be renewed or extended for such term or terms as may be agreed upon by Authority and District.

IN WITNESS WHEREOF, Authority and District have caused this Agreement to be executed in triplicate originals by their duly authorized representatives as of the date first set forth above.

SOMERVELL COUNTY WATER DISTRICT

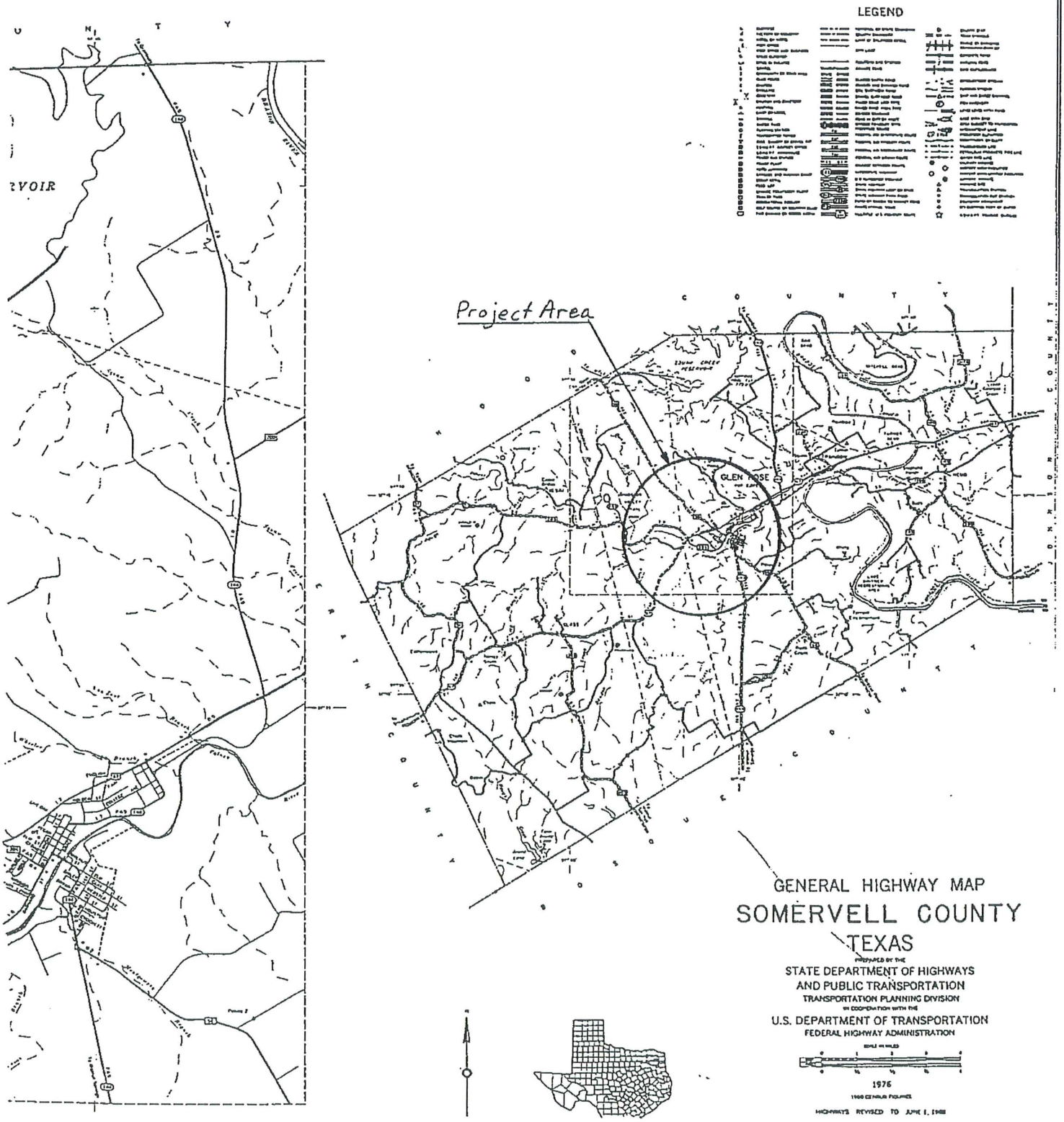
By: _____
Hugh Smith, President, Board of Directors

BRAZOS RIVER AUTHORITY

By: _____
Gary Gwyn, General Manager

EXHIBIT

4


LEGEND
Project Area
GLEN ROSE
GENERAL HIGHWAY MAP
SOMERVELL COUNTY
TEXAS
STATE DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION
TRANSPORTATION PLANNING DIVISION
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1976

APPENDIX G

HYDROLOGIC DATA AND APPROACH TO OPERATION STUDY

APPENDIX G

HYDROLOGIC DATA AND APPROACH TO OPERATION STUDY

Area-Capacity-Elevation Data

The relationship among reservoir elevation, surface area and capacity for the Wheeler Branch Reservoir was computed based on U.S.G.S. "*Hill City*" quadrangle map (scale 1:24,000). The reservoir surface areas were calculated at ten-foot elevation contour intervals. The area-elevation data were smoothed and areas estimated at one-foot intervals. Reservoir capacities were estimated using the trapezoidal method. Area and capacity data for the Wheeler Branch Reservoir are presented in Table G-1 and shown on Figure G-1.

Inflow Data

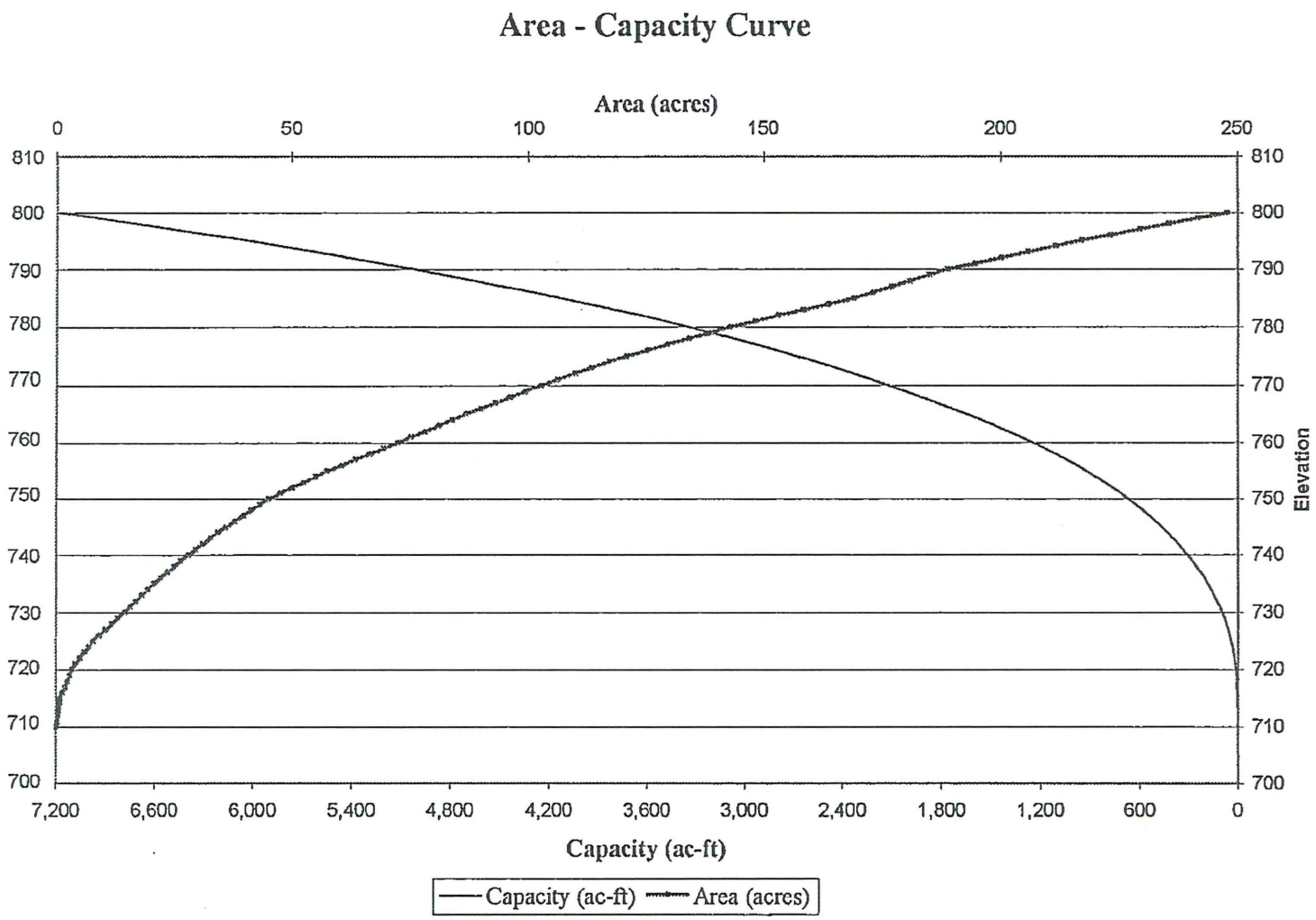
The drainage area for Wheeler Branch Reservoir was also delineated from the U.S.G.S. map (scale 1:24,000), and is estimated at 1.62 square miles. Inflow to the reservoir from local runoff is expected to be minimal due to the small drainage area, and therefore was not considered in the operation study. Only diversions from the Paluxy River were included in the operation study of the Wheeler Branch Reservoir.

Diversions from the Paluxy River were calculated based on historical stream flow at the U.S.G.S. river gage near Glen Rose, required bypass flows, and reservoir content. Historical stream flows from June 1947 through September 2000 at station number 8091500 were obtained from the U.S.G.S. website [11] (http:/tx.usgs.gov), and these flows were adjusted for the diversion point based on drainage area ratios (427.1 square miles at the diversion dam and 410 square miles at the gage). Minimum flows were allowed to pass the diversion point to protect downstream water rights and instream flows in the Paluxy River. The bypass flows at the diversion point were based on the approved water right for the City of Clifton and are shown on Table G-2. When river flows exceed the minimum flow requirements and the Wheeler Branch Reservoir is not at capacity, water from the Paluxy is diverted to Wheeler Branch Reservoir at a maximum rate of 50 cfs.

Table G-1
Area – Capacity Data for Wheeler Branch Reservoir

Elevation	0	1	2	3	4	5	6	7	8	9	
710	0	0	0	1	1	1	1	2	2	3	Acres
	0	0	1	1	2	2	4	5	7	10	Ac-ft
720	3	4	5	6	7	8	9	11	12	13	Acres
	13	17	21	27	33	41	49	59	70	83	Ac-ft
730	15	16	17	18	20	21	22	24	25	27	Acres
	97	112	128	146	165	185	206	229	254	280	Ac-ft
740	28	30	31	33	34	36	38	40	42	43	Acres
	307	336	366	399	432	467	504	543	584	626	Ac-ft
750	45	48	50	53	55	57	60	63	66	69	Acres
	670	717	766	817	871	927	986	1,048	1,113	1,181	Ac-ft
760	72	75	78	81	84	87	90	93	96	99	Acres
	1,252	1,325	1,402	1,482	1,564	1,649	1,737	1,829	1,923	2,021	Ac-ft
770	103	106	110	113	117	121	125	130	134	138	Acres
	2,122	2,227	2,335	2,446	2,561	2,680	2,803	2,931	3,062	3,198	Ac-ft
780	143	148	153	158	164	169	173	177	181	185	Acres
	3,339	3,484	3,635	3,791	3,952	4,118	4,289	4,464	4,643	4,826	Ac-ft
790	189	195	200	206	211	217	223	229	236	242	Acres
	5,013	5,205	5,402	5,605	5,814	6,028	6,248	6,474	6,707	6,946	Ac-ft

Figure G-1


Area - Capacity Curve
Area (acres)
0
50
100
150
200
250
810
800
790
780
770
760
750
740
730
720
710
700
Elevation
7,200
6,600
6,000
5,400
4,800
4,200
3,600
3,000
2,400
1,800
1,200
600
0
Capacity (ac-ft)
Capacity (ac-ft)
Area (acres)

Diversions were calculated on a daily basis and aggregated on a monthly basis for the operation model. Inflows to the reservoir are presented with the modeling results in Appendices H and I.

Table G-2
Monthly Bypass Flows at the Paluxy River Diversion
(in cfs)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
3.4	5.3	7.6	8.8	8.8	8.8	1.6	1.6	1.6	1.6	1.6	1.6

Evaporation Data

Gross evaporation data for the Wheeler Branch Reservoir site for the years 1947 to 1997 were obtained from the Texas Water Development Board website[12] at www.twdb.state.tx.us. The data for years prior to 1954 were developed from non-standard evaporation pans and were not adjusted by the TWDB with the new pan coefficients. As a result the data from 1947 to 1953 do not reflect reduced evaporation rates and represent a conservative estimate of gross evaporation. For years 1998 to September 2000, gross evaporation depths were taken from the records collected at nearby reservoirs and published by NOAA in its monthly *Climatological Data* bulletin[13]. Pan factors and relative location factors were applied to the observed data to obtain estimates of the gross evaporation at Wheeler Branch Reservoir.

The net evaporation data were calculated by subtracting precipitation from the gross evaporation numbers. Effective runoff was considered but it was negligible. The precipitation data used were those from the Glen Rose 2W gage, as published by NOAA, for years 1964 through 2000. Precipitation data prior to 1964 was taken from the Rainbow rainfall gage. Table G-3 is a summary of the monthly net evaporation depths for the Wheeler Branch reservoir site.

Table G-3
Net Evaporation for Wheeler Branch Reservoir
(in feet)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1947	0.015	0.249	0.109	0.141	0.353	0.547	1.002	0.757	0.740	0.503	0.196	-0.130	4.483
1948	0.053	-0.108	0.225	0.420	0.239	0.446	0.683	0.799	0.637	0.565	0.467	0.334	4.761
1949	-0.217	-0.048	0.086	0.045	-0.005	0.244	0.752	0.687	0.659	0.140	0.443	0.074	2.860
1950	-0.143	-0.024	0.458	0.086	0.131	0.460	0.259	0.811	0.069	0.663	0.592	0.359	3.721
1951	0.215	0.067	0.316	0.322	0.049	0.026	0.635	0.839	0.706	0.501	0.303	0.272	4.252
1952	0.186	0.229	0.177	-0.125	0.040	0.830	0.923	1.239	0.804	0.795	-0.088	0.003	5.012
1953	0.271	0.205	0.129	0.145	0.190	0.947	0.655	0.642	0.729	0.229	0.145	0.251	4.538
1954	0.066	0.339	0.363	0.070	0.183	0.459	0.742	0.888	0.705	0.233	0.132	0.198	4.381
1955	0.066	0.090	0.302	0.277	-0.042	0.345	0.530	0.504	-0.209	0.367	0.345	0.174	2.751
1956	0.105	-0.010	0.438	0.199	0.302	0.648	0.908	0.819	0.676	0.187	0.171	0.057	4.498
1957	0.111	-0.019	0.114	-0.690	-0.432	0.264	0.692	0.731	0.302	-0.128	-0.223	0.063	0.785
1958	-0.018	0.024	-0.020	-0.084	0.045	0.362	0.537	0.453	-0.157	0.182	0.099	0.069	1.493
1959	0.168	0.021	0.453	0.074	0.325	-0.065	0.176	0.506	0.348	-0.445	0.176	-0.063	1.672
1960	-0.140	0.101	0.196	0.250	0.171	0.405	0.456	0.460	0.451	0.242	0.256	-0.293	2.555
1961	-0.414	-0.015	0.211	0.401	0.236	-0.227	0.106	0.516	0.272	-0.184	0.009	0.064	0.974
1962	0.123	0.224	0.232	0.017	0.409	0.068	0.380	0.393	-0.097	-0.053	0.024	0.104	1.821
1963	0.130	0.170	0.259	0.187	0.075	0.390	0.621	0.572	0.187	0.440	0.048	0.042	3.121
1964	-0.124	0.110	0.029	-0.012	0.337	0.502	0.808	0.594	0.195	0.236	-0.035	0.149	2.791
1965	-0.074	-0.153	0.241	0.385	-0.560	0.498	0.742	0.592	0.468	0.129	0.055	-0.069	2.254
1966	0.027	-0.055	0.311	0.079	0.141	0.127	0.655	0.188	0.049	0.324	0.319	0.106	2.273
1967	0.253	0.215	0.313	0.214	0.194	0.422	0.184	0.705	-0.103	0.198	0.131	-0.030	2.696
1968	-0.353	0.001	-0.039	0.092	-0.425	0.346	0.372	0.496	0.351	0.353	0.019	0.161	1.373
1969	0.175	0.029	-0.152	-0.132	-0.073	0.471	0.719	0.322	0.264	-0.158	0.164	-0.061	1.568
1970	0.067	-0.179	-0.094	0.004	0.137	0.463	0.688	0.674	-0.058	0.179	0.346	0.275	2.501

Table G-3 (continued)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1971	0.249	0.187	0.513	0.305	0.136	0.562	0.176	0.200	0.278	-0.467	0.048	-0.372	1.814
1972	0.084	0.216	0.434	0.204	0.019	0.530	0.563	0.339	-0.043	-0.050	-0.016	0.160	2.439
1973	-0.149	0.019	0.141	-0.322	0.298	-0.293	0.036	0.601	0.163	-0.145	0.159	0.246	0.754
1974	0.002	0.248	0.383	0.488	0.305	0.530	0.706	0.183	-0.323	-0.182	0.092	0.040	2.472
1975	0.069	-0.065	0.119	0.085	0.016	0.431	0.319	0.526	0.293	0.443	0.294	0.067	2.596
1976	0.265	0.319	0.270	-0.152	-0.091	0.390	0.292	0.448	0.157	-0.100	0.143	-0.034	1.906
1977	-0.020	0.129	-0.150	-0.014	0.112	0.485	0.640	0.467	0.605	0.311	0.136	0.302	3.004
1978	0.039	-0.134	0.266	0.344	-0.025	0.605	0.787	0.543	0.147	0.426	-0.100	0.158	3.057
1979	-0.150	-0.067	-0.214	0.072	-0.259	0.223	0.390	0.427	0.236	0.306	0.223	-0.171	1.017
1980	0.046	0.140	0.238	0.209	-0.166	0.618	0.876	0.739	0.086	0.413	0.141	-0.011	3.329
1981	0.123	0.099	0.099	0.248	0.158	-0.001	0.562	0.480	0.368	-0.425	0.072	0.183	1.967
1982	0.096	-0.023	0.108	0.118	-0.315	0.027	0.350	0.598	0.554	0.245	-0.073	0.016	1.702
1983	0.064	0.128	0.073	0.405	-0.252	0.398	0.618	0.454	0.403	0.269	0.216	0.060	2.835
1984	0.128	0.172	-0.136	0.469	0.347	0.518	0.569	0.653	0.522	-0.305	0.113	-0.264	2.789
1985	0.128	0.007	0.124	0.095	0.277	0.418	0.544	0.708	0.415	-0.096	0.061	0.125	2.806
1986	0.252	0.076	0.352	0.321	-0.483	-0.051	0.420	0.527	-0.521	-0.009	0.073	-0.129	0.828
1987	0.023	-0.198	0.219	0.451	-0.460	0.009	0.600	0.574	0.288	0.416	0.035	-0.006	1.950
1988	0.172	0.190	0.345	0.373	0.328	-0.167	0.427	0.642	0.098	0.189	0.301	0.075	2.972
1989	0.005	-0.137	-0.263	0.223	-0.453	-0.333	0.624	0.192	0.208	0.401	0.291	0.224	0.982
1990	-0.067	-0.125	-0.164	-0.149	-0.305	0.403	0.435	0.138	0.244	0.161	-0.045	0.067	0.594
1991	-0.154	0.169	0.352	0.129	0.006	0.073	0.720	0.112	0.110	-0.353	0.164	-0.716	0.613
1992	-0.141	-0.252	0.180	0.158	-0.289	0.168	0.519	0.131	0.353	0.416	-0.031	-0.115	1.098
1993	-0.083	-0.084	0.059	0.167	0.178	0.255	0.954	0.809	0.381	-0.094	0.129	-0.004	2.667
1994	0.065	0.029	0.197	0.193	-0.012	0.529	0.590	0.656	0.016	-0.117	-0.113	-0.090	1.943
1995	0.073	0.161	-0.145	0.130	-0.075	0.173	-0.185	0.401	0.189	0.429	0.201	0.134	1.486

Table G-3 (continued)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1996	0.188	0.271	0.294	0.276	0.508	0.337	0.484	-0.305	-0.015	0.104	-0.103	0.200	2.238
1997	0.191	-0.525	0.092	-0.091	0.142	0.110	0.528	0.494	0.515	-0.063	0.109	-0.177	1.326
1998	0.037	-0.241	-0.139	0.385	0.316	0.497	0.693	0.475	0.353	0.083	-0.252	-0.008	2.199
1999	0.085	0.250	0.100	0.321	0.128	0.166	0.593	0.739	0.504	0.283	0.250	0.040	3.460
2000	0.026	0.167	0.123	0.278	0.381	-0.297	0.645	0.750	0.582	0.436	0.290	0.200	3.581
Average	0.041	0.048	0.158	0.15	0.046	0.302	0.55	0.535	0.281	0.156	0.128	0.043	2.438

Operation Study

A monthly operation model of the Wheeler Branch Reservoir was used to estimate the minimum content of the diversion/off-channel storage system for a demand of 2,000 acre-feet per year. Flow was diverted from the Paluxy River to the reservoir after minimum flows were allowed to pass and when the reservoir was less than full. Diversions were adjusted as needed, so that the diversions did not cause spills from the Wheeler Branch Reservoir. The operation study included the historical period of June 1947 to October 2000. Based on a maximum diversion rate of 50 cfs, the minimum content over this time period was 2,143 acre-feet, occurring in September 1984. The critical period occurred from June 1983 to September 1984. However, there were several times between 1978 and 1985 that the reservoir content went below 3,000 acre-feet. The maximum annual diversion from the Paluxy River was 3,487 acre-feet, which occurred in 1979. Figure G-2 is a plot of the Wheeler Branch reservoir content over time using historical flows.

Consideration of NRCS Structures

The historical analysis of the Wheeler Branch Reservoir described above considered historical flows with no adjustments due to the construction of NRCS structures in the watershed. Beginning in 1980, 19 NRCS structures have been constructed in the Paluxy River drainage basin upstream of the diversion dam. Seven additional structures are proposed for construction. If all structures were completed, they would have a combined drainage area of 219.2 square miles and a total storage capacity of 4,038 acre-feet. This is a significant portion of the drainage basin upstream of the diversion dam. Figure G-3 is a watershed map showing the location of the existing and proposed NRCS reservoirs in the Paluxy watershed. Table G-4 lists available hydrologic data for the structures.

Additional operation studies were conducted to assess the potential impacts of NRCS structures on available flows for diversion. The historical analysis identified two time periods with low river flows: one during the 1950s, and the other in the late 1970s and early 1980s. Therefore, the impacts of NRCS structures were examined during these two drought periods.

For the analysis, it was assumed that all proposed NRCS structures were completed during the respective study period. The historical flow at the diversion point was adjusted based on drainage area ratios (219.2 – NRCS structures, 427.1 – total drainage area). For the analysis during the 1980s, the historical flows were first adjusted to account for NRCS structures that were already completed. Revised flows were then calculated as if all NRCS structures were in place. The flows captured by NRCS structures were routed through an operation study and spills estimated from the NRCS structures were added to the Paluxy River flow at the diversion point.

As with the historical analysis, minimum flows were allowed to pass the diversion point. When river flows exceeded the minimum flow requirements and the Wheeler Branch Reservoir is not at capacity, water is diverted from the Paluxy River at a maximum rate of 50 cfs. Diversions were calculated on a daily basis and aggregated on a monthly basis for the operation model. Inflows considering NRCS structures are presented with the modeling results in Appendix I.

The results of the studies found that the most significant droughts occurred between 1977 and 1985. During this time period the content of the reservoir was less than 1,600 acre-feet in 1978 and again in 1984. The minimum content of 1,540 acre-feet occurred in September 1984. The critical period leading to this minimum content was from June 1983 to September 1984. The maximum annual amount diverted was 4,529 acre-feet in 1979. During the 1950s, the minimum content was 2,278 acre-feet. Figure G-3 is a plot of the content of the Wheeler Branch Reservoir from July 1977 to May 1985, showing both the content under historical flows and with full impact of NRCS structures. The monthly output from this NRCS analysis (1977 to 1985) is included in Appendix I.

Figure G-2

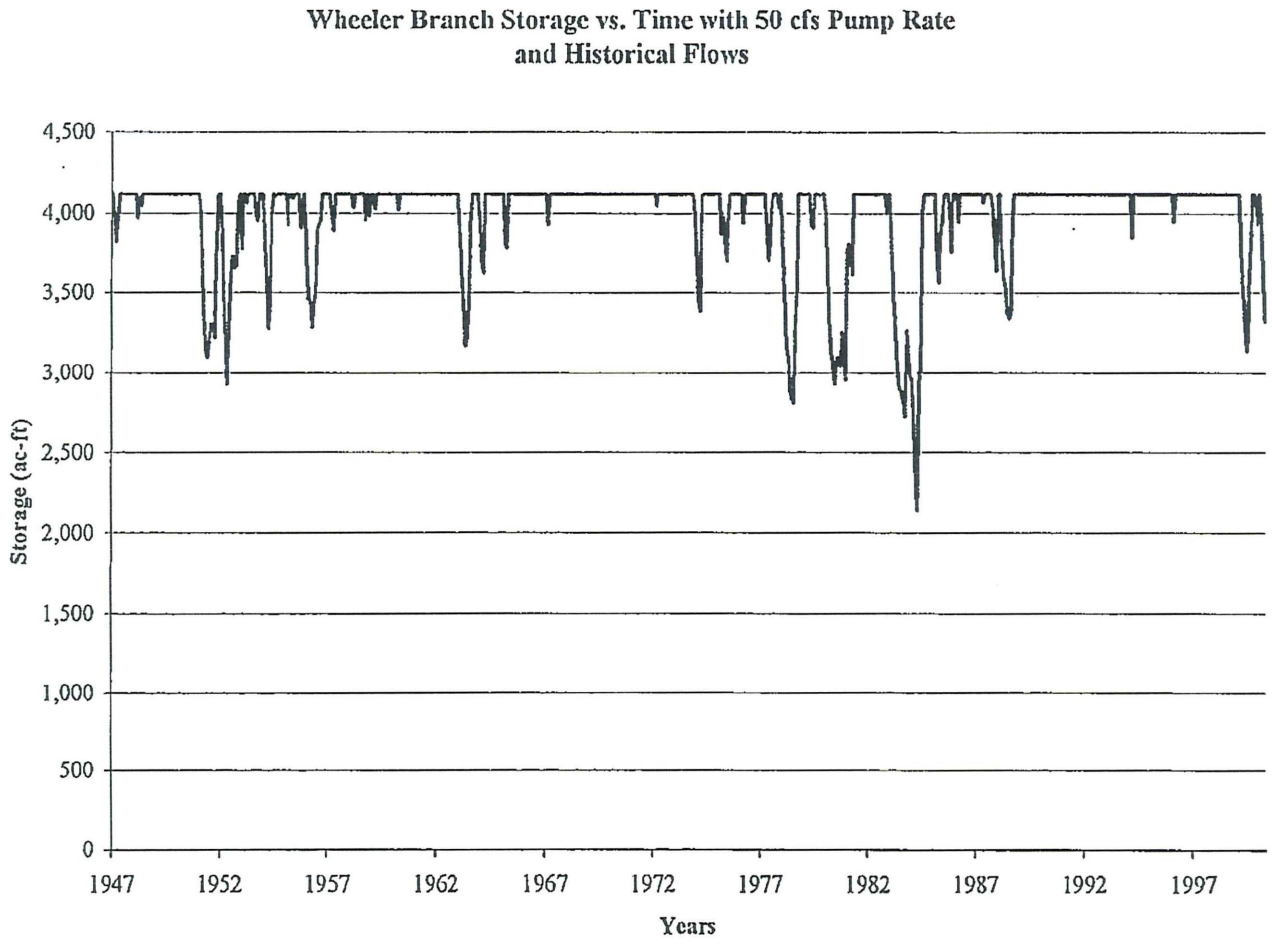

Wheeler Branch Storage vs. Time with 50 cfs Pump Rate
and Historical Flows
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Storage (ac-ft)
1947
1952
1957
1962
1967
1972
1977
1982
1987
1992
1997
Years

Table G-4
Available Data on NRCS Structures

NCRS Structure	Built	Stream Watershed	Storage[1] (ac-ft)	Surface area[1] (acres)	Drainage Area (sq. mi.)
1	yes	Unnamed Trib North Paluxy	137	24	3.9
2	yes	Unnamed Trib North Paluxy	102	20	3.06
3	yes	Unnamed Trib North Paluxy	93	16	2.4
4	yes	Unnamed Trib North Paluxy	74	15	2.11
5	yes	Germany Creek	153	25	4.34
6	yes	Straight Creek	150	24	4.84
8	yes	Hightower Creek	71	13	2.02
9	yes	Unnamed Trib South Paluxy	146	20	3.04
10	yes	Unnamed Trib South Paluxy	65	14	2.01
11	yes	Unnamed Trib South Paluxy	42	8	1.39
12	yes	Unnamed Trib South Paluxy	111	25	4.51
14	yes	Berrys Creek	113	20	3.91
15	yes	Wolf Creek	200	42	12.31
16	yes	Paluxy River	200[2]	39[3]	4.87
19	yes	Sycamore Creek	200	34	11.36
20	yes	Pony Creek	200	36	17.89
21	yes	Lallah Branch	200	35	15.62
23	yes	Rough Creek	181	22	4.64
25	yes	White Bluff	200	36	11.44
Sub total:			**2,638**	**468**	**115.66**
7	no	Counts Creek	200	58	11.94
13	no	Berrys Creek	200	36	12
17	no	Indian Camp Creek	200[2]	103[3]	20.61
18	no	Richardson Creek	200	53	23
22	no	Pony Creek	200	70	16.36
24	no	Prairie Creek	200	31	6.29
26	no	Bowden Branch	200[2]	85[3]	13.32
Sub total:			**1,400**	**436**	**103.52**
TOTAL			**4,038**	**904**	**219.18**

1. Storage capacity and surface area is based on the lowest ungated outlet.
2. Capacity value was not available. Assumed storage capacity is the maximum of known NRCS structures' capacities (200 ac-ft).
3. Surface area was not available. Assumed surface area is comparable to NRCS structures in nearby locations.