**Assessment of Effectiveness of
Geologic Isolation Systems**

**CIRMIS Data System
Volume 4. Driller's Logs,
Stratigraphic Cross Section
and Utility Routines**

D. R. Friedrichs

January 1980

**Prepared for the
Office of Nuclear Waste Isolation
under its Contract with the
U.S. Department of Energy**

**Pacific Northwest Laboratory
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FOREWORD

The Assessment of Effectiveness of Geologic Isolation Systems (AEGIS) Program is developing and applying the methodology for assessing the far-field, long-term post-closure safety of deep geologic nuclear waste repositories. AEGIS is being performed by Pacific Northwest Laboratory (PNL) under contract with the Office of Nuclear Waste Isolation (ONWI) for the Department of Energy (DOE). One task within AEGIS is the development of methodology for analysis of the consequences (water pathway) from loss of repository containment as defined by various release scenarios.

Analysis of the long-term, far-field consequences of release scenarios requires the application of numerical codes which simulate the hydrologic systems, model the transport of released radionuclides through the hydrologic systems to the biosphere, and, where applicable, assess the radiological dose to humans.

Essentially three modeling technologies are involved in assessing the water pathway release consequence. These models are: 1) hydrologic models that define the groundwater flow field and provide water flow paths and travel times, 2) transport models that describe the movement and concentrations of the radionuclides in the flow field, and 3) dose models that determine the resultant radiation doses to individuals and/or populations. Figure i is a schematic flow diagram for the release consequence analysis.

The various input parameters required in the analysis are compiled in data systems. The data are organized and prepared by various input subroutines for use by the hydrologic and transport codes. The hydrologic models simulate the groundwater flow systems and provide water flow directions, rates, and velocities as inputs to the transport models. Outputs from the transport models are basically graphs of radionuclide concentration in the groundwater plotted against time. After dilution in the receiving surface-water body (e.g., lake, river, bay), these data are the input source terms for the dose models, if dose assessments are required. The dose models calculate radiation dose to individuals and populations.

FIGURE i. Schematic Diagram of Consequence Analysis

Hydrologic and transport models are available at several levels of complexity or sophistication. Model selection and use are determined by the quantity and quality of input data. Model development under AEGIS and related programs provides three levels of hydrologic models, two levels of transport models, and one level of dose models (with several separate models). The models and data systems are documented as follows:

- HYDROLOGIC MODELS:

PNL-3162 PATHS Groundwater Hydrologic Model - first level (simplest) idealized hybrid analytical/numerical model for two-dimensional, saturated groundwater flow and single component transport; homogeneous geology.

PNL-3160 VTT (Variable Thickness Transient) Groundwater Hydrologic Model - second level (intermediate complexity) two-dimensional saturated groundwater flow, Boussinesq approximation, finite difference approach; two-dimensional (quasi three-dimensional) multiaquifer capability; heterogeneous geology.

PNL-2939 FE3DGW (Finite Element, Three-Dimensional Groundwater) Hydrologic Model - third level (high complexity) three-dimensional, finite element approach (Galerkin formulation) for saturated groundwater flow; heterogeneous geology.

- TRANSPORT MODELS:

PNL-2970 GETOUT Transport Model - first level one-dimensional analytical solution considering radioactive chain decay with capability for only simple release and hydrologic functions; single speciation, constant flow rate, dispersion and sorption, three-member straight decay chains.

PNL-3179 MMT (Multicomponent Mass Transport) Model - second level, one-dimensional numerical, discrete parcel random walk (DPRW) algorithm; chain decay, single speciation, equilibrium sorption, time-variant leach rate and dispersion, n-membered straight or branched decay chains.

- DOSE MODELS:

- PNL-3180 ARRRG - drinking water, external exposure to aquatic food, water and shorelines, and FOOD - terrestrial food.
- PNL-3209 PABLM - Combination of ARRRG and FOOD with additional features related to chronic releases.
- BNWL-B-264 KRONIC - chronic external dose from air pathways.
- BNWL-B-351 SUBDOSA - acute external dose from air pathways.
- BNWL-B-389 DACRIN - chronic or acute inhalation dose from air pathways.

- DATA SYSTEMS:

- PNL-3139 SIRS (Sorption Information Retrieval System) - storage and retrieval system for experimental data on sorption/desorption analyses for a wide variety of radionuclides, groundwater compositions, and rocks and minerals.
- PNL-3161 CIRMIS (Comprehensive Information Retrieval and Model Input Sequence) Data System - storage and retrieval system for model input and output data, including graphical interpretation and display.

This is the fourth of four volumes of the description of the CIRMIS Data System.

Return of the form on the last page of this report is required in order to remain on the distribution list for future revisions of the model.

ACKNOWLEDGMENT

This research was supported by the Waste Isolation Safety Assessment Program (WISAP) conducted by Pacific Northwest Laboratory. The program was sponsored by the Office of Nuclear Waste Isolation, managed by Battelle Memorial Institute for the Department of Energy under Contract EY-76-C-06-1830. On 1 October 1979, WISAP became the Assessment of Effectiveness of Geologic Isolation Systems (AEGIS) Program and the Waste/Rock Interactions Technology (WRIT) Program. This report was issued by AEGIS.

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INITIAL SETUP PROCEDURES FOR INTERPRETED DRILLER'S LOGS

The information obtained from a well driller's log can be very useful in the study and modeling of a groundwater system. This information can be stored and retrieved very rapidly, and by following the procedures listed below, the data can be easily implemented to produce listings, cross-sectional plots of an individual well, or cross-sectional plots of wells projected to a user selected reference line.

1. Enter well names, coordinates and casing elevations into CIRMIS data base (see Sequence for Initializing CIRMIS Data Base for New Projects). If the data base has already been initialized, this step can be skipped.
2. Determine local stratigraphy and assign ascending numbers to each stratigraphic layer. Figure 1⁽¹⁾ shows a stratigraphic chart of the Pasco basin which was used with the Hanford study. Table 1 shows the computer codes assigned to each strata. Note that the code number for a group is always larger than those of the sub-group. Table 2 shows the computer codes assigned to the WIPP site.
3. Interpret driller's logs and enter into the CIRMIS data base using the 11/45 computer program WLGEN (see Well Log Update and Retrieval - this volume).

GEOLOGIC
TIME SCALE

* INFORMALLY USED NAME OR STRATIGRAPHIC RANK
NOTE: THIS STRATIGRAPHIC CHART IS UNDER REVISION

VT607-13 26

FIGURE 1. Stratigraphy of the Pasco Basin

TABLE 1. Hanford Site Stratigraphic Computer Code Assignments

Aeolian Sediments	100
Touchet Silts	201
Pasco Gravels	202
Hanford Formation	203
Glaciofluvialtile	204
Palouse Soil	205
Ringold Formation	300
Ice Harbor Member	401
Levey	402
Elephant Mountain Member	403
Selah	405
Gable Mountain Member	407
Cold Creek	408
Huntzinger Member	409
Umatilla Member	410
Saddle Mountains Basalt Formation	411
Mabton	412
Priest Rapids Member	403
Roza Member	414
Frenchman Springs Member	415
Wanapum Basalt Formation	416
Vantage Sandstone Formation	417
Grande Ronde Basalt Formation	418
Yakima Basalt	419
Columbia River Basalt Group	420

TABLE 2. WIPP Site Stratigraphic Computer Code Assignments

Ogallala	101
Holocene	102
Cretaceous	201
Gatuna	302
Santa Rosa	303
Triassic	304
Dewey Lake	401
Rustler	402
Salado	403
Castile Anhydrite	404
Tansill Limestone	405
Yates Sandstone	406
Capitan Reef	407
San Andres Dolomite	408
Glorieta Sandstone	409
Delware Mt. Group	410
Leonard Series	411
Wolfcamp Series	412
Permian	413
Detrital	500
Strawn Series	501
Atoka Series	502
Morrow Series	503
Pennsylvania	504
Barnett Shale	601
Mississippian Limestone	602
Woodford Shale	701
Devonian Limestone	702

WELL LOG DATA UPDATE AND RETRIEVAL

Previous to January 1977 drillers logs were entered as they appeared in old log books. Each entry that existed in these books for each well was entered into the data base. Much of the notation was, however, abbreviated in order to compact the massive amount of data. These data exist on one mag tape (Foreign) labeled DRILLERS LOGS (7/31/74). The data were read from cards by a program called READF, which packed the data for each well into a buffer and output it to the mag tape. Each buffer size was directly related to the amount of data in the well being operated on, thereby reducing the amount of wasted space on the tape.

After all of the well data were transferred to mag tape, they could then be entered into the CIRMIS data base for rapid retrieval. A program called WLGEN MAG can be used to read the data from the mag tape and enter them into the data base. The programs to retrieve the data using the CIRMIS system are called WLGCMAG (Calcomp plots) and WLGLPRMAG (line printer listings).

Since the original drillers logs were not interpreted by anyone with a geological expertise and were strictly the well drillers interpretation, they were found to be virtually useless in many cases, especially since many drillers have operated on the Hanford Project over the past three decades and each may have logged identical soil types in exactly to radically different manners.

To overcome this problem geologists have since begun studying the original drillers logs and are developing compacted interpreted logs based on known soil types and stratigraphy within the Hanford Reservation.

These new logs which contain a more studied approach to the data will replace the original drillers logs in the data base. This does not mean that the massive amounts of data taken from the original well log books will be lost. The data still exist and can be retrieved, but the data must be regenerated on disc. Since the basic structure of the well header has recently been updated, the generator and retrieval programs must have minor modifications before operating. The modifications required are the storage locations of the addresses and pointers to each well log.

NEW WELL LOG OPERATION PROCEDURES

The raw data for the new interpreted well logs are stored in card image in a formatted file on disc. The name of this file is specified by the user.

The formatted log data must be stored on the ICRMIS File-Q disc in a random access file (FRMTWLG), with pointers to each well's log data entered into the master header file (WELLHDR). This is done by a generator program called WLGGEN. This program has two modes of operation. These are 1) deleting any existing well log entries in the CIRMIS data base and regenerating a new data base and 2) appending new wells to the existing CIRMIS well log data base.

Once the well log data have been entered into the CIRMIS data base, the programs to retrieve the data in various forms may be initialized. The procedures for accomplishing this are described in the steps below.

I. ENTERING WELL LOG DATA INTO FORMATTED FILE

Well log data are first entered into a formatted file before the well logs are entered into the CIRMIS data base. File procedures are:

- A. Key punch new log data in the format shown in Table 3.
- B. When all data have been keypunched, place a CREATE card at the front of the deck and two FIN cards at the end as shown in Table 4.
- C. Place card deck into card reader hopper (right side)
- D. Turn POWER switch on
- E. Turn RESET switch on
- F. The card deck should now read into the computer and the data stored in the file specified on the CREATE card. When the cards have been read in, the user must enter the log data into the CIRMIS data base, described in Step II.

TABLE 3. Card Format Used for Interpreted Hanford Well Log

	<u>Column</u>	<u>Name</u>	<u>Description</u>	<u>Format</u>	<u>Data Type</u>
<u>CARD TYPE 1</u>					
Header Information					
	1	ICARD	Card Type Indicator (ICARD = 1)	I1	Integer
	2	ICONT	Not used	I1	Integer
	3-14	WDES	Well Designation	3A4	Real
	15-20	DDATE	Date	A4,A2	Real
	21-26	BPEPTH	Blank	6X	
	27-32	TOTDEP	Total Depth	F6.0	Real
	33-56	OWN	Owners Name	6A4	Real
	57-80	DRL	Drillers Name	6A4	Real
<u>CARD TYPE 2</u>					
Strata Information					
	1	ICARD	Card Type Indicator (ICARD = 2)	I1	Integer
	2	ICONT	Line Continuation Indicator	I1	Integer
	3-14	WDES	Same as Card Type 1		
	15-20		Blank		
	21-26	BDEPTH	Top elevation at which strata begins	F6.0	Real
	27-32		Blank		
	33-80	STRATA	Name of Strata (may exceed 12 real words if ICONT ≠ 1)	12A4	Real
<u>CARD TYPE 3</u>					
Soil Type					
	1	ICARD	Card Type Indicator (ICARD = 3)	I1	Integer
	2	ICONT	Line Continuation Indicator (continuation line if ICONT ≠ 1)	I1	Integer
	3-14	WDES	Same as Card Type 1		
	15-26	SHADE	Soil Descriptor (left justified)	A4,A2	Real
	27-32	EDEPTH	Depth at which this soil ends	F6.0	Real
	33-80	SOILS	Name of Soil (may exceed 12 real words if ICONT ≠ 1)	12A4	Real
<u>CARD TYPE 4</u>					
Comment					
	1	ICARD	Card Type Indicator (ICARD = 4)	I1	Integer
	2	ICONT	Line Continuation indicator (continuation line if ICONT ≠ 1)	I1	Integer
	3-14	WDES	Same as Card Type 1		
	15-26		Blank		
	27-32	DEPTH	Depth at which comment applies	F6.0	Real
	33-80	COMM	Special comment (may exceed 12 real words if ICONT ≠ 1)	12A4	Real

TABLE 4. Sample Card Input

```

CREATE [166,215]LOGOTA,FOR
11 699 S6 E4C050053432,98461. ROW
21 699 S6 E4C 0.0 RECENT EOLIAN DEPOSITS
31 699 S6 E4CSM 15.0 SILTY SAND
21 699 S6 E4C 15.0 GLACIOFLUVIAL SEDIMENTS
31 699 S6 E4CSG 20.0 BROWN AND WHITE COARSE SAND, GRAVEL
31 699 S6 E4CGS 25. GRAVEL AND SAND
31 699 S6 E4CSG 35. BROWN AND WHITE FINE SAND, GRAVEL
31 699 S6 E4CGS 55. FINE GRAVEL AND SAND
31 699 S6 E4CGS 65. GRAVEL, SAND, CAVES, VERY PERMEABLE
21 699 S6 E4C 65. RINGOLD FORMATION
31 699 S6 E4CSG 70. SAND, GRAVEL, CAVES, VERY PERMEABLE
31 699 S6 E4CSG 75. SAND AND GRAVEL
31 699 S6 E4CSG 78. SAND, GRAVEL, WATER BEARING
31 699 S6 E4CSG 80. SAND AND GRAVEL
31 699 S6 E4CSG 90. SAND, GRAVEL, SILT
31 699 S6 E4CMGS 115. SILT, SAND, GRAVEL
31 699 S6 E4CMGS 185. BLUE/GRAY SILT, SAND, GRAVEL, SULPHUR OODR
31 699 S6 E4CSGM 195. SAND, GRAVEL, SILT, BLUE/GRAY
31 699 S6 E4CGS7 197. GRAVEL, SAND, SILT
31 699 S6 E4CMS 200. GREEN SILT AND SAND
31 699 S6 E4CMGS 230. GREENSILT, SAND, FINE GRAVEL
31 699 S6 E4CM 233. GREEN SILT
31 699 S6 E4CGS 237. GRAVEL AND SAND
31 699 S6 E4CMGS 255. MUD WITH BASALT GRAVEL AND SAND
31 699 S6 E4CMS 275. SANDY BLUISH GREEN SILT WITH TRACE OF GRAVEL
31 699 S6 E4CSGM 281. FINE SAND, GRAVEL, GREEN SILT
31 699 S6 E4CMGS 285. BLACK MUD, GRAVEL, AND SAND
31 699 S6 E4CGS 295. INDURATED GRAVEL AND SAND
31 699 S6 E4CM 300. DARK SILT
31 699 S6 E4CM 305. BLACK/GRAY MUD WITH WOOD PIECES
31 699 S6 E4CG 307. GRAVEL
31 699 S6 E4CMGS 322. BLACK/GRAY MUD WITH MINOR FINE GRAVEL AND SAND
31 699 S6 E4CMGS 329. BLUE SILT, GRAVEL, SAND
21 699 S6 E4C 329. ELEPHANT MT. MEMBER
31 699 S6 E4CB 334. BASALT FLOW
21 699 S6 E4C 334. HATTLESNAKE RIDGE INTERBED
31 699 S6 E4CMGS 340. GREEN SANDY SILT WITH GRAVEL
31 699 S6 E4CSGM 357. GREEN/BLUE SILTY SAND WITH GRANULES AND PEBBLES
31 699 S6 E4CSGM 367. GREEN/BLUE SILTY SAND WITH GRAVEL UP TO COBBLES
32 699 S6 E4CSGM 367. IN SIZE
31 699 S6 E4CMGS 395. ASH, SILTY SAND, GRAVEL, GREEN TO BLACK
31 699 S6 E4CMGS 415. GREEN SANDY GRAVELLY SILT
21 699 S6 E4C 415. POMONA MEMBER
31 699 S6 E4CB 440. RED/BROWN TO BLACK SCORIFICIOUS BASALT
31 699 S6 E4CB 461. VESICULAR BASALT, HARDENING DOWNWARD
#FIN
#FIN

```

II. INSERTING LOG DATA INTO CIRMIS DATA BASE

This step takes the formatted log data specific by the user and stores it in the CIRMIS data base on a File-Q disc in a random access file called FRMTWLG. As each well is read in, appropriate pointers and addresses are stored in the header file WELLHDR on the File-Q disc. The procedures for doing this are described below.

1. Prior to proceeding to Steps 2A or 2B the ICRMIS File-Q disc must be mounted on Units 1 or 2 as shown below.

```
MCR>HEL 166,215
MCR>DMOU DP2:
DMO -- DP2:  ** DISMOUNT COMPLETE **
MCR>MOU DP2:/CHA=[FOR,ATCH]
MOUNT-**VOLUME INFORMATION**
      DEVICE      =DP2
      CLASS       =FOREIGN
      UIC         =[1,1]
      ACCESS      =[RWED,RWED,RWED,RWED]
      CHARAC      =[FOR,ATCH,DCF]
```

- 2A. After the File-Q disc has been mounted the entire well log data base can be regenerated using a formatted file containing all of the log data using the following procedure.

```
MCR RUN WLGEN$
***** WELL LOG RANDOM ACCESS FILE GENERATION *****
ENTER FILE Q DISC UNIT NUMBER > 2
INPUT WELL LOG FILENAME      > DP:[166,215]LOGDTA.FOR
IS THIS A COMPLETE REGENERATION? (Y OR N) > Y
** THE WELL LOGS ARE BEING REGENERATED **
WLGEN  --  STOP
```

2B. If well logs are to be added to the existing data base, the following procedure is followed.

```
MCR RUN WLGEN$
**** WELL LOG RANDOM ACCESS FILE GENERATION ****
ENTER FILE Q DISC UNIT NUMBER > 2
INPUT WELL LOG FILENAME      >DP:[166,215]LOG012077.FOR
IS THIS A COMPLETE REGENERATION? (Y OR N) > N
** THE WELL LOGS ARE BEING APPENDED WITH ADDITIONAL WELLS ***
WLGEN -- STOP
```

Table 5 shows a printout using the procedure of Step 2A. The start block for the first well is at 0 because the data base has been completely regenerated.

The number of blocks required for storage of each well log can be calculated for the number of words contained in each log using the following equation

$$NBLKS = (NWORDS)/256 + 1$$

This is done in integer notation. Using the wells shown in Table 1 the block sizes are:

$$\text{Well 1} - NBLKS = (972)/256 + 1 = 4$$

$$\text{Well 2} - NBLKS = (1172)/256 + 1 = 5$$

The storage locations for each well are then:

	<u>Start Block</u>	<u>End Block</u>
Well 1	0	3
Well 2	4	8

The next free location is therefore at block Number 9.

Table 6 shows a printout using the procedure of Step 2B. This printout shows that the start block for the first well is at 9 which was the next free location calculated from Step 2A.

Table 7 shows a printout if the two wells in Table 5 and the two wells in Table 6 were combined and the data base totally regenerated using Step 2A.

TABLE 5. Complete Regeneration Using Step 2A

**** WELL LOG RANDOM ACCESS FILE GENERATION ****
"FRMTWLG"

TIME= 08:08:35 DATE= 24-JAN-76

NO. ---	START BLOCK -----	START WORD -----	NO. OF WORDS -----	IDBIT (OCTAL) -----	WELL DESIGNATION -----
1	0	1	972	13	699 S6 E4C
2	4	1	1172	10	699 12 1

TABLE 6. Appending Data Using Step 2B

**** WELL LOG RANDOM ACCESS FILE GENERATION ****
"FRMTWLG"

TIME= 08:10:16 DATE= 24-JAN-76

NO. ---	START BLOCK -----	START WORD -----	NO. OF WORDS -----	IDBIT (OCTAL) -----	WELL DESIGNATION -----
1	9	1	330	13	399 1 2
2	11	1	256	13	399 4 1

TABLE 7. Complete Regeneration Using the Four Wells in Tables 5 and 6

**** WELL LOG RANDOM ACCESS FILE GENERATION ****
"FRMTWLG"

TIME= 08:20:52 DATE= 24-JAN-76

NO. ---	START BLOCK -----	START WORD -----	NO. OF WORDS -----	IDBIT (OCTAL) -----	WELL DESIGNATION -----
1	0	1	972	13	699 S6 E4C
2	4	1	1172	10	699 12 1
3	9	1	330	13	399 1 2
4	11	1	256	13	399 4 1

When the WLGEN program has terminated and the liner printer listing has been produced (Tables 5, 6 and 7), all of the log data are ready for access. Two methods of accessing well log data are available and are described in Steps III and IV.

III. BYPASSING CIRMIS INTERACTIVE CONTROL

This procedure allows the user to bypass the normal CIRMIS interaction using the light pen and scope. This procedure is done entirely on the 11/45 computer. Once the well log data have been inserted on the CIRMIS File-Q disc, they can be retrieved and output in four different modes.

The user types the information shown in Table 8 on one of the 11/45 terminals. A CIRMIS File-Q disc must be used and can be mounted on either disc Unit 1 or 2 as specified by the user.

Once the preliminary information shown in Table 8 has been completed, the user may output any of the well logs existing in the data base to a specified device. The RUN>MNTRII Command is described below:

MCR>RUN MNTRII

data type, output device, disc unit (Line 1)

where,

data type = 3 - for well logs

output device = 1 - Calcomp plotter

= 2 - line printer

= 3 - Gould (without shading)

= 4 - Gould (with shading)

disc unit = 1 or 2 - as specified by the MOU command.

Well Designation (Line 2)

where: The well designation is entered in a 3A4 format (right justified in each field.

Control Z (line 3)

where: Z starts specified retrieval program.

TABLE 8. Bypassing CIRMIS Interaction

```

MCR>HEL [1,4]
MCR>DMOU DP2:
DMO -- DP2: ** DISMOUNT COMPLETE **
MCR>MOU DP2:/CHA=[FOR,ATCH]
MOUNT-***VOLUME INFORMATION**
      DEVICE  =DP2
      CLASS   =FOREIGN
      UIC      =[1,1]
      ACCESS  =[RWED,RWED,RWED,RWED]
      CHARAC  =[FOR,ATCH,DCF]

```

} Preliminary Setup Procedures

```

MCR>INS
INS>[106,215]MNTR11
INS>[106,215]JWLGCAL
INS>[106,215]JWLGLD
INS>[106,215]JWLGTGP
INS>[106,215]JWLGLPR
INS>^Z

```

```

MCR>REA MNTR11 7 TI:
MCR>LOA GD
MCR>LOA MM

```

```

MCR>RUN MNTR11$
3,1,2,
399 1 2
^Z
1

```

} Output to Calcomp
(see Figure 2)

```

MCR>RUN MNTR11$
3,2,2,
399 1 2
^Z
1

```

} Output to Line Printer
(see Figure 3)

```

MCR>RUN MNTR11$
3,3,2,
399 1 2
^Z
1

```

} Output to Gould w/o Shading
(see Figure 4)

```

MCR>RUN MNTR11$
3,4,2,
399 1 2
^Z
1

```

} Output to Gould with Shading
(see Figure 5)

WELL NO. 399 1 2 10-FEB-77 07:45:23

DATE: 10-FEB-77
 CDR: J. S.
 DILLON: J. S.
 CDR: J. S.

FIGURE 2. Calcomp Plot of Well Log Data

WELL NO. 399 1 2 TOTAL DEPTH= 141.70

DATE: 033050
DRILLER: ROW
FORMAN:

RECENT EOLIAN DEPOSITS

DEPTH	MATERIALS PENETRATED
5.	SILTY SAND

GLACIOFLUVIAL SEDIMENTS

DEPTH	MATERIALS PENETRATED
15.	BOULDERS, SAND AND SILT
30.	BLACK SAND AND FINE GRAVEL
38.	MOSTLY GRAVEL, SOME SAND
40.	GRAVEL, SAND AND CLAY
50.	GRAVEL
60.	COARSE SAND AND GRAVEL
75.	GRAVEL, SAND AND SOME SILT

RINGOLD FORMATION

DEPTH	MATERIALS PENETRATED
80.	GRAVELLY SAND AND VOLCANIC MUD
85.	BLACK SAND AND GRAVEL. CAVES
99.	FINE SAND, SOME GRAVEL AND SOME VOLCANIC MUD
101.	GRAVEL AND SAND

FIGURE 3. Line Printer Listing of Well Log Data

WELL NO. 395

1 2

STATION-78

26-03-40

33.5 ft
100

FIGURE 4. Gould Plot of Well Log Data (without shading)

WELL NO. 399

1

2

24-JUN-78

0001048

0001048
2004

FIGURE 5. Gould Plot of Well Log Data (with shading)

IV. CIRMIS INTERACTIVE RETRIEVAL

The CIRMIS System was developed to utilize two machine systems and provide the user with a means of graphically recalling several types of data for the Hanford Project. A complete description of this method of retrieval is documented in the Data System - Volume 4 CIRMIS Description, Initialization, Operation, and Documentation, in the section, "User's Manual."

STRATIGRAPHIC CROSS SECTION DESCRIPTIONS
AND SETUP PROCEDURES

A number of routines were developed to produce stratigraphic cross sectional plots of wells projected onto a user selected reference line. The original data are retrieved from the well log information stored in the CIRMIS data base. The steps required to obtain these plots (displays) are given below:

1. Generate a binary file on the 11/55 computer containing strata codes using the following:
 - a) Replace section (TO FIND-AND-STORE-STRATA-CODE) in the Program WLGSMRY with the proper names and strata codes for the project being analyzed.
 - b) Rebuild the task image for (220,101) WLGSMRY.
 - c) Run WLGSMRY
2. Generate a random access disc file on the 11/55 computer containing strata information and a well display file using the following:
 - a) Newdirect DK1
 - b) Edit (351,102) LOGSU.INP and put in proper file names to be used with LOGSU and CROSEC.
 - c) Run LOGSU
- 3) Prepare and run program to display stratigraphic cross-sectionao projections using the following:
 - a) Replace section in 351,102) CROSC2 that check strata code to display proper strata names.
 - b) Install CROSEC and CROSC2
 - c) Run CROSEC

REFERENCES

1. Staff, Research and Engineering Division, "Feasibility Study on Storage of Radioactive Wastes in Columbia River Basalts," ARH-ST-137, Atlantic Richfield Company, Richland, WA, November 1, 1976.

APPENDIX

PROGRAM LISTINGS AND SAMPLE OUTPUT

PROGRAM LISTING WLGGEN

```

C ***** [220,3]WLGGEN.FTN *****
C
C PROGRAM ID: GEN-11-WEL-3 ABREVIATED WELL NAME VERSION
C CIRMIS SYSTEM, OCTOBER 1978
C
C PROGRAM DESCRIPTION:
C PROGRAM DESIGNED TO READ DRILLER LOG DATA FROM DISC (INPUT)
C EX: (LOGOTA.FOR) INSERT THE APPROPRIATE ENTRIES IN "WELHNR"
C AND DATA IN "FRMTWLG" ON THE CIRMIS FILE Q DISC.
C "HANFORD RESERVATION"
C
C DATA FILES:
C NAME LUN TYPE ACCESS
C FILE Q--WELHNR 1 RAN R/W
C FILE Q--FRMTWLG 1 RAN W
C WELL LOG FILE 2 FOR R
C EX: (DP:[220,3]LOGOTA.FOR)
C
C LOADING SEQUENCE:
C MCR>TK8 @ [220,3]WLGGEN
C MCR>RUN WLGGEN
C
C BATTELLE MEMORIAL INSTITUTE
C PACIFIC NORTHWEST LABORATORIES
C WATER & LAND RESOURCES DEPT.
C
C AUTHOR(S): DR FRIEDRICH
C RS ARGO
C
C DATE: INITIAL VERSION SEPTEMBER 1975
C CURRENT VERSION NOVEMBER 1978
C
C
C 0001 BYTE WLDOS, WNAME, WLAST(12), BBUF(12)
C 0002 BYTE BLANK, O, TIM(8), DAT(9), ANS
C
C 0003 INTEGER*4 JUP(120)
C
C 0004 LOGICAL ENDOP
C
C 0005 DIMENSION OWNNEW(6), URLNEW(6), NOUM(4000)
C 0006 DIMENSION BUF(2000), DUMM(12), IBUF(256)
C 0007 DIMENSION IUP(256), WFILE(7)
C
C 0008 COMMON I1, I2, WNAME(12), T(2), O1, O2, D(48), I4, I5
C
C 0009 COMMON /HDR/ WLDOS(12), IDW1(12), IDBIT, IDW2(200),
C 1 OWN(6), OHL(6), IFREE(10), IZZ1, IZZ2, IWNAM, IWHDR
C
C 0010 COMMON /TYP2/ SOILS(100), TC(2), COMM(200), EXPL(100)
C
C 0011 EQUIVALENCE (O(1), DUMM(1)), (IBUF(1), WLDOS(1))
C 0012 EQUIVALENCE (BUF(1), NDUM(1)), (BUF(1), BBUF(1))
C 0013 EQUIVALENCE (JUP(1), IUP(1))
C
C 0014 DATA BLANKS/4H /
C
C
C
C

```

```

0015      WRITE (5,510)
0016      510      FORMAT (///,' **** WELL LOG RANDOM ACCESS FILE GENERATION ****',/
C
0017      WRITE (5,5000)
0018      5000      FORMAT ('ENTER FILE=Q DISC UNIT (I.E. DP2, DP1 OR DB2) >')
0019      READ (5,5001) IOISC,IUN
0020      5001      FORMAT (A2,I1)
C
0021      CALL ASNLUN (1,IOISC,IUN)
C
0022      CALL OPFILE (1,'WELLMOR',6000,,IWMOR)
0023      CALL OPFILE (1,'WELLNAM',101,,IWNAM)
0024      CALL OPFILE (1,'PRMTWLG',8000,,IWLK)
0025      CALL OPFILE (1,'UPDATEHOR',1,,IUMOR)
C
0026      IWN = IWNAM
C
0027      WRITE (5,502)
0028      502      FORMAT (/, 'INPUT WELL LOG FILENAME          > ')
0029      READ (5,503) WFILE
0030      503      FORMAT (7A4)
C
0031      ICR = ICHR(WFILE)
C
0032      OPEN (UNIT=2,NAME=WFILE,TYPE='QLO',READONLY)
0033      OPEN (UNIT=6,NAME='WLGGEN.LST',TYPE='NEW')
C
0034      WRITE (5,504)
0035      504      FORMAT (/, 'IS THIS A COMPLETE REGENERATION? (Y OR N) > ')
0036      READ (5,505) ANS
0037      505      FORMAT (A1)
C
0038      IF(ANS.EQ.'Y') GO TO 5
C
C      APPENDING WELLS--DO NOT ZERO ENTIRE BITMAP
C
0039      CALL DPR (IUMOR,0,,IUP,256.)
C
0040      BLK1 = JUP(101)
C
0041      WRITE (5,506)
0042      506      FORMAT (///,' ** THE WELL LOGS ARE BEING APPENDED WITH',
C
C      1' ADDITIONAL WELLS **',//)
C
0043      GO TO 9
C
C      ZERO BITMAP
C
0044      5      WRITE (5,507)
0045      507      FORMAT (///,' ** THE WELL LOGS ARE BEING REGENERATED **',//)
C
0046      WS = -1.
C
0047      DO 6 I=1,6000
0048      WS = WS+1.
C
0049      CALL DPR (IWMOR,WS,IHUF,256.)
C
0050      IF(WLDES(1).EQ.'9') GO TO 6
C
0051      CALL SPLD (3,1,0,IDBIT)
C

```

```

0052      CALL DPW (IWHOR,HS,I0UF,256.)
0053      C
0053      6      CONTINUE
0054      C
0054      BLK1 = 0.
0055      C
0055      9      DO 9001 J=1,4
0056      WLAST(J) = '9'
0057      WLAST(J+4) = ' '
0058      WLAST(J+8) = ' '
0059      9001    CONTINUE
0060      C
0060      NWELL = 0
0061      JB = 0
0062      N = 0
0063      ITYPE = 0
0064      ENDOF = .FALSE.
0065      NLINE = 0
0066      C
0066      WRITE (6,600)
0067      600      FORMAT (1H1,' **** WELL LOG RANDOM ACCESS FILE GENERATION ****'
0067      1/,20X,' FRMTWLG' ,//)
0068      C
0068      CALL TIME (TIM)
0069      CALL DATE (DAT)
0070      C
0070      WRITE (6,601) TIM,DAT
0071      601      FORMAT (13X,'TIME= ',8A1,'      DATE= ',9A1,///)
0072      C
0072      WRITE (6,602)
0073      602      FORMAT (4X,'NO.      START      START      NO. OF      IDBIT',13X,'WELL',
0073      1/,10X,'BLOCK      WORD      WORDS      (OCTAL)',9X,'DESIGNATION',/,
0073      24X,'---      -----      -----      -----      -----',9X,'-----'
0073      3//)
0074      C
0074      C
0074      C ***** START READING DATA *****
0075      10      READ (2,201,END=499,ERR=90) I1,I2,WNAME,T(1),T(2),D1,D2,D
0075      201      FORMAT (2I1,12A1,A4,A2,2F6,0,48A1)
0076      C
0076      WRITE (5,511) I1,I2,WNAME,D1,D2,(D(L),L=1,10),N
0077      511      FORMAT (2I1,12A1,2F7.1,10A1,'      **N=',I6)
0078      C
0078      NLINE = NLINE+1
0079      C
0079      GO TO (1050,15,30,50),I1
0080      C
0080      C CARD TYPE 1
0081      C
0081      DO 1051 J=1,12
0081      IF(WNAME(J).NE.WLAST(J)) GO TO 11
0082      1051    CONTINUE
0083      C
0083      GO TO 1250
0084      C
0084      C NEW WELL
0085      C
0085      IF(NWELL.EQ.0) GO TO 12
0086      C
0086      WRITE LAST WELL TO DISC
0087      C

```

```

0085      IF(ITYPE,EQ,0) GO TO 1120
          C
0086      IPLACE = 5
          C
0087      GO TO(999,60,70,80),ITYPE
          C
0088      1120  DO 1121 J=1,12
0089            RBUF(J) = WLAST(J)
0090      1121  CONTINUE
          C
0091      N = N + 1
0092      RUF(4) = N
0093      RUF(5) = DATE1
0094      RUF(6) = DATE2
0095      RUF(7) = TOTDEP
0096      RUF(N) = 5
0097      ITYPE = 0
0098      IWNAM = IWN
          C
0099      CALL RTVHDD (WLAST,FQADR)
          C
0100      IF(FQADR,GE,0,) GO TO 1125
          C
          C---HEADER DATA NOT FOUND
          C
0101      WRITE (6,611) WLAST
0102      611   FORMAT (' THIS WELL NAME NOT FOUND IN HEADER FILE = ',12A1)
          C
0103      GO TO 1150
          C
          C---HEADER DATA FOUND - DOES DATA ALREADY EXIST ?
          C
0104      1125  CALL DPR (IWHDR,FQADR,IBUF,256,)
          C
0105      IF (IFLD(3,1,IDBIT) .EQ. 0) GO TO 1130
          C
0106      WRITE (6,612) WLAST
0107      612   FORMAT (' DATA ALREADY EXISTS = ',12A1)
          C
0108      GO TO 1150
          C
          C---HEADER DATA FOUND
          C
0109      1130  NWRD = N + 2
          C
          C-----MAKE WELL LOG ENTRY IN MASTER INDEX FILE
          C
0110      JB = 0
0111      NSTRT = JB
0112      IDKNT = 8LK1
0113      IBUF(40) = IDKNT
0114      IBUF(41) = NSTRT
0115      IBUF(42) = NWRD
          C
0116      DO 1135 J=1,6
0117        OWN(J) = OWNNEW(J)
0118        ORL(J) = ORLNEW(J)
0119      1135  CONTINUE
          C
          C-----MAKE ENTRY IN BITMAP
          C
0116      CALL SFLO (3,1,1,IDBIT)
          C
0121      CALL DPW (IWHDR,FQADR,IBUF,256,)
          C

```

```

0122      LSTRT = 1
C
0123      WRITE (6,613) NWELL,IOKNT,LSTRT,NWRD,IOBIT,WLAST
0124      613      FORMAT (2I7,I8,2X,I8,3X,09,10X,12A1)
C
C-----TRANSFER DATA TO DISC FILE
C
0125      JB = 0
C
0126      DO 1140 J=1,NWRD
0127      JB = JB + 1
0128      IBUF(JB) = NOUM(J)
C
0129      IF(JB,LT.256) GO TO 1140
C
0130      CALL DPM (IWL6,BLK1,IBUF,256.)
C
0131      BLK1 = BLK1 + 1.
0132      JB = 0
0133      1140      CONTINUE
C
C
0134      IF(JB,EQ.0) GO TO 1150
C
0135      CALL DPM (IWL6,BLK1,IBUF,256.)
C
C
0136      BLK1 = BLK1 + 1.
0137      JB = 0
C
0138      1150      IF(ENDOF) GO TO 99
C
0139      12      DO 1201 J=1,12
0140      WLAST(J) = WNAME(J)
0141      1201      CONTINUE
C
0142      N = 7
0143      NWELL = NWELL + 1
C
C      WRITE LAST CARD TYPE IF ANY
C
0144      1250      IF(ITYPE,EQ.0,OR,ITYPE,EQ.1) GO TO 13
C
0145      IPLACE = 1
C
0146      GO TO(999,60,70,80),ITYPE
C
C      CARD TYPE 1---HEADER INFO
C
0147      13      ITYPE = 1
0148      N = N + 1
0149      IBUF(N) = ITYPE
0150      OATE1 = T(1)
0151      OATE2 = T(2)
0152      TOTDEP = 02
C
0153      DO 1320 K=1,6
0154      OWNNEW(K) = DUMM(K)
0155      ORLNEW(K) = DUMM(K+6)
0156      1320      CONTINUE
C
0157      GO TO 10
C
C      CARD TYPE 2---STRATA
C

```



```

0158 15      IF(I2,NE.1) GO TO 17
      C
      C      STORE LAST CARD TYPE
0159 16      IF(ITYPE.EQ.0,OR,ITYPE.EQ.1) GO TO 16
      C
0160      IPLACE = 2
      C
0161      GO TO (999,60,70,80),ITYPE
      C
0162 16      ITYPE = 2
0163      NEXPL = 0
0164      TIM2 = T(1)
0165      DEPTH2 = 01
0166      ISAMP = 0
0167      ICONT = 0
      C
0168 17      DO 18 J=1,12
0169      IF(DUMM(J).EQ,BLANKS) GO TO 18
0170      NEXPL = NEXPL + 1
0171      EXPL(NEXPL) = DUMM(J)
0172 18      CONTINUE
      C
0173      GO TO 18
      C
      C
      C      CARD TYPE 3---SOILS
0174 30      IF(I2,NE.1) GO TO 36
      C
      C      STORE LAST CARD TYPE
0175 35      IF(ITYPE.EQ.0,OR,ITYPE.EQ.1) GO TO 35
      C
0176      IPLACE = 3
      C
0177      GO TO (999,60,70,80),ITYPE
      C
0178 35      ITYPE = 3
0179      TIM3 = T(1)
0180      DEPTH = 02
0181      NSOIL = 0
      C
0182 36      DO 37 J=1,12
0183      IF(DUMM(J).EQ,BLANKS) GO TO 18
      C
0184      NSOIL = NSOIL + 1
0185      SOILS(NSOIL) = DUMM(J)
0186 37      CONTINUE
      C
0187      GO TO 18
      C
      C
      C      CARD TYPE 4
0188 50      IF(I2,NE.1) GO TO 56
      C
      C      STORE LAST CARD TYPE
0189 55      IF(ITYPE.EQ.0,OR,ITYPE.EQ.1) GO TO 55
      C
0190      IPLACE = 4
      C

```

```

0191      GO TO (999,60,70,80), ITYPE
          C
0192      55      ITYPE = 4
0193      TC(1) = T(1)
0194      TC(2) = T(2)
0195      CDEP = 02
0196      NCOM = 0
          C
0197      56      DO 57 J=1,12
          C

0198      IF(OUHM(J).EQ.BLANKS) GO TO 10
          C
0199      NCOM = NCOM + 1
0200      COMM(NCOM) = OUHM(J)
0201      57      CONTINUE
          C
0202      GO TO 10
          C
          C
          C      SETUP BUFFER FOR CARD TYPES 2,3 & 4
          C
          C      CARD TYPE 2---EXPLANATION(STRATA)
          C
0203      60      N = N + 1
0204      BUF(N) = FLOAT(ITYPE)
0205      N = N + 1
0206      BUF(N) = TIM2
0207      N = N + 1
0208      BUF(N) = DEPTH2
0209      N = N + 1
0210      BUF(N) = FLOAT(ISAMP)
0211      N = N + 1
0212      BUF(N) = FLOAT(ICONT)
0213      N = N + 1
0214      BUF(N) = NEXPL
          C
0215      IF(NEXPL.EQ.0) GO TO 62
          C
0216      DO 61 J=1,NEXPL
0217      N = N + 1
0218      BUF(N) = EXPL(J)
0219      61      CONTINUE
          C
0220      62      GO TO (13,16,35,55,1120), IPLACE
          C
          C      CARD TYPE 3---SOILS
          C
          C
0221      70      N = N + 1
0222      BUF(N) = FLOAT(ITYPE)
0223      N = N + 1
0224      BUF(N) = TIM3
0225      N = N + 1
0226      BUF(N) = DEPTH
0227      N = N + 1
0228      BUF(N) = NSOIL
          C
0229      IF(NSOIL.EQ.0) GO TO 72
          C
0230      DO 71 J=1,NSOIL
0231      N = N + 1
0232      BUF(N) = SOILS(J)
0233      71      CONTINUE
          C
0234      72      GO TO(13,16,35,55,1120), IPLACE
          C
          C      CARD TYPE 4---COMMENTS

```

```

C
02 80      N = N + 1
0236      BUF(N) = FLOAT(ITYPE)
0237      N = N + 1
0238      BUF(N) = TC(1)
0239      N = N + 1
0240      BUF(N) = TC(2)
0241      N = N + 1
0242      BUF(N) = CDEP
0243      N = N + 1
0244      BUF(N) = FLOAT(NCOM)

C
0245      IF(NCOM, EQ, 0) GO TO 82

C
0246      DO 81 J=1, NCOM
0247      N = N + 1
0248      BUF(N) = COMM(J)
0249      A1      CONTINUE

0250      82      GO TO(13,16,35,55,1120), IPLACE
C
C
C ***** READ THRU END OF FILE *****
C
0251      499      ENDOF = .TRUE.
C
0252      GO TO 11

C ***** INPUT DATA ERROR *****
C
0253      90      WRITE (5,590) NLINE, *LAST
0254      590      FORMAT (///, ' INPUT DATA ERROR', 5X, 'LAST LINE=', IS, 'LAST WELL=',
112A1)

C
0255      CLOSE (UNIT=6, DISPOSE='SAVE')
C
0256      STOP

C ***** CARD TYPE ERROR *****
C
0257      999      WRITE (5,599) NLINE, *LAST
0258      599      FORMAT (///, ' CARD TYPE ERROR', 5X, 'LAST LINE=', IS, 'LAST WELL=',
112A1)

C
0259      CLOSE (UNIT=6, DISPOSE='SAVE')
C
0260      STOP

C
C *** DONE -- STORE LAST FREE SECTOR IN UPDATE HEADER FILE.
C
0261      99      CALL OPR (IUMOR, 0., IUP, 256.)
C
0262      JUP(101) = 8LK1
C
0263      CALL OPW (IUMOR, 0., IUP, 256.)
C
0264      CLOSE (UNIT=6, DISPOSE='SAVE')
C
0265      STOP
0266      END

```

PROGRAM SECTIONS

NAME	SIZE	ATTRIBUTES
SCODE1	005324 1386	RW,I,CON,LCL
SPOATA	000162 57	RW,O,CON,LCL
SIOATA	002136 547	RW,O,CON,LCL
SVAR3	021020 4360	RW,O,CON,LCL
STEMPS	000002 1	RW,O,CON,LCL
,\$\$\$\$.	000124 42	RW,O,OVR,GBL
HOR	001002 257	RW,O,OVR,GBL
TYP2	003610 964	RW,O,OVR,GBL

TOTAL SPACE ALLOCATED = 035574 7614

,LP1=DP1:(220,4)WLGGEN

SAMPLES WLGGEN INPUT FILE

(LOGDTA.FOR)

11w1	12457.	PAN AMERICAN
21w1	0.	RUSTLER DOLOMITE AND ANHYDRITE
21w1	331.	SALADO EVAPORITES
21w1	827.	CAPITAN REEF
21w1	3171.	DELAWARE MT. GROUP
21w1	5569.	LEONARD SERIES
21w1	9998.	WOLFCAMP SERIES
21w1	10477.	UPPER PENNSYLVANIAN
21w1	10752.	STRAWN SERIES
21w1	10890.	ATOKA SERIES
21w1	11304.	MORROW SERIES
21w1	12269.	BARNETT SHALE
11w2	14059.	SHELL OIL CO.
21w2	0.	RUSTLER DOLOMITE AND ANHYDRITE
21w2	303.	SALADO EVAPORITES
21w2	1323.	CASTILE ANHYDRITE
21w2	2840.	DELAWARE MT. GROUP
21w2	6286.	LEONARD SERIES
21w2	9181.	WOLFCAMP SERIES
21w2	11083.	STRAWN SERIES
21w2	11331.	ATOKA SERIES
21w2	11428.	MORROW SERIES
21w2	12544.	BARNETT SHALE
21w2	12958.	MISSISSIPPIAN LIMESTONE
21w2	13454.	WOODFORD SHALE
11w2	13647.	DEVONIAN LIMESTONE
11w3	15605.	RICHARDSON-BASS
21w3	0.	TRIASSIC RED BEDS
21w3	248.	DEWEY LAKE
21w3	358.	RUSTLER DOLOMITE AND ANHYDRITE
21w3	579.	SALADO EVAPORITES
21w3	1920.	CASTILE ANHYDRITE
21w3	3281.	DELAWARE MT. GROUP
21w3	6837.	LEONARD SERIES
21w3	9677.	WOLFCAMP SERIES
21w3	12048.	STRAWN SERIES
21w3	12324.	ATOKA SERIES
21w3	12710.	MORROW SERIES
21w3	13454.	BARNETT SHALE
21w3	13950.	MISSISSIPPIAN LIMESTONE
21w3	14074.	WOODFORD SHALE
21w3	14640.	DEVONIAN LIMESTONE
21w3	14860.	SILURIAN LIMESTONE
21w3	15219.	MONTOYA DOLOMITE
21w3	15467.	SIMPSON SHALE

SAMPLES WLGGEN OUTPUT LISTING

(WLGGEN.LST)

**** WELL LOG RANDOM ACCESS FILE GENERATION ****
 "FRMTWLG"

TIME= 06150132 DATE= 19-DEC-78

NO. ---	START BLOCK -----	START WORD -----	NO. OF WORDS -----	IDBIT (OCTAL) -----	WELL DESIGNATION -----
1	0	1	248	10	W1
2	1	1	296	10	W2
3	3	1	398	10	W3
4	5	1	498	10	W4
5	7	1	498	10	W5
6	9	1	402	10	W6
7	11	1	392	10	W7
8	13	1	426	10	W8
9	15	1	350	10	W9
10	17	1	246	10	W10
11	18	1	288	10	W11
12	20	1	418	10	W12(JR-1)
13	22	1	356	10	W13
14	24	1	352	10	W14
15	26	1	436	10	W15
16	28	1	436	10	W16
17	30	1	306	10	W17
18	32	1	374	10	W18
19	34	1	318	10	W19
20	36	1	270	10	W20
21	38	1	360	10	W21
22	40	1	442	10	W22
23	42	1	340	10	W23
24	44	1	340	10	W24
25	46	1	422	10	W25
26	48	1	342	10	W26
27	50	1	482	10	W27
28	52	1	374	10	W28
29	54	1	270	10	W29
30	56	1	294	10	W30
31	58	1	316	10	W31
32	60	1	458	10	W32
33	62	1	436	10	W33
34	64	1	476	10	W34
35	66	1	324	10	W35
36	68	1	286	10	W36
37	70	1	250	10	W37
38	71	1	86	10	I-123
39	72	1	126	10	ERDA-6
40	73	1	126	10	AEC-7

BACKGROUND MAP DISPLAY FILE SETUP DESCRIPTION
SETUP PROCEDURES

In most cases it is beneficial to have a background map of the region being modeled. This map is not only used with the groundwater models but also with the various display programs used by the CIRMIS system and ancillary utility programs, such as the stratigraphic cross-sectional display program. The procedures for producing these maps are given below:

1. Digitize a regional map using the CIRMIS program MAPDRW (see CIRMIS programs and output). This program produces both a map source file and a map display file whose names are specified by the user.
2. If corrections are to be made, the map source file can be edited, additional parts of the original map can be digitized and appended to the source file, and the 11/55 Utility Program (351,200) MAPSU can be run.

PROGRAM LISTING

MAPSU

```

-----
00001 C ***** [351,200]MAPSU.FLX *****
00002 C
00003 C NEW VERSION TO CORRESPOND WITH UPDATED MAPORW.
00004 C ***** WIPP SITE 11/55 *****
00005 C
00006 C PROGRAM TO READ A FORMATTED MAP FILE AND BUILD EITHER:
00007 C 1) A VS60 DISPLAY FILE
00008 C 2) A CALCOMP PLOT FILE (OI:[351,200]MAPSU.DSP)
00009 C
00010 C
00011 C BYTE CHAR(40), SOURCE(30), DSPNAM(30), PAUS
00012 C BYTE CARD (35),KEYBUF(80)
00013 C REAL MAXMAP
00014 C
00015 C DIMENSION X(500),Y(500)
00016 C
00017 C COMMON MAP(3000)
00018 C COMMON/DSP/ MAIN(100), KEYOUT(100), IBOX(20),LPLAR(200),
00019 C 1 MESS1(60), MESS2(60), IOUT1(100),IOUT2(100)
00020 C
00021 C
00022 C WRITE(5,501)
00023 501 FORMAT('ENTER MAP SOURCE FILE NAME,EXT > ')
00024 C READ (5,502) SOURCE
00025 502 FORMAT(30A1)
00026 C ICH = ICHR(SOURCE)
00027 C OPEN (UNIT=3,NAME=SOURCE,TYPE='OLD',READONLY)
00028 C
00029 C
00030 C WRITE (5,505)
00031 505 FORMAT('ENTER NODESX,NODESY,XINC,YINC > ')
00032 C READ (5,506) NODESX,NODESY,XINC,YINC
00033 506 FORMAT(2I5,2F10,0)
00034 C WRITE (5,507)
00035 507 FORMAT('PAUSE AFTER EVERY RECORD? (Y OR N) > ')
00036 C READ (5,502) PAUS
00037 C IF (PAUS.EQ.'Y')
00038 C . WRITE (5,508)
00039 508 . FORMAT('HIT "RETURN" TO CONTINUE AFTER PAUSE',/)
00040 C ...FIN
00041 C XMAX = FLOAT(NODESX-1) * XINC
00042 C YMAX = FLOAT(NODESY-1) * YINC
00043 C MAXMAP = AMAX1(XMAX,YMAX)
00044 C CALCULATE "DISPLAY" SCALE FACTOR
00045 C WHEN(YMAX.GT.XMAX) DSMAX=900.
00046 C ELSE
00047 C . TEST = 900./1023.
00048 C . TMAP = YMAX/XMAX
00049 C . WHEN (TMAP.LE.TEST) DSMAX = 1023.
00050 C . ELSE
00051 C . . DSMAX = (TEST/TMAP)*1023.
00052 C . ...FIN
00053 C ...FIN
00054 C DSCALE = DSMAX/MAXMAP
00055 C IK0 = 0
00056 C IO1 = 0
00057 C IO2 = 0
00058 C
00059 C
00060 C CALL MAINOF (MAIN,100,1,1,0,2)
00061 C CALL CLKUFF
00062 C
00063 C SETUP=DISPLAY=FILES
00064 C READ=DATA=AND=DISPLAY=MAP

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00065 C
00066 C
00067 C
00068 C
00069 19 CALL GRATIN (0,ITYP,'LP')
00070 C
00071 IF (ITYP.NE.'LP') GO TO 19
00072 CALL LTPEN (ID,ITIP)
00073 IF (ITIP.EQ.1)
00074 . SELECT (ID)
00075 . . (1)
00076 . . . CALL STRTSB (MESS1)
00077 . . . CALL GRECHO (KEYBUF,NCHAR,800,950,0,0,IK8)
00078 . . . DECODE(NCHAR,502,KEYBUF) DSPNAM
00079 . . . CALL STOPSB (MESS1,LPLAB)
00080 . . . IF (ID2.EQ.1) CALL STOPSB (IOUT2)
00081 . . . CALL SUBOF (IOUT1,100)
00082 . . . CALL CHRSC (1)
00083 . . . CALL APOS (0,950)
00084 . . . CALL TEXT ('DISPLAY FILE NAME =')
00085 . . . CALL APOS (200,950)
00086 . . . CALL TEXT (DSPNAM,0,NCHAR)
00087 . . . CALL ENDSB
00088 . . . ICH = ICHR(DSPNAM)
00089 . . . CALL SAVSOF (3,DSPNAM,MAP)
00090 . . . CALL STRTSB (LPLAB)
00091 . . . ID1 = 1
00092 . . . FIN
00093 . . (2)
00094 . . . CALL STRTSB (MESS2)
00095 . . . CALL GRECHO (KEYBUF,NCHAR,800,950,0,0,IK8)
00096 . . . DECODE(NCHAR,519,KEYBUF) FACT
00097 519 . . . FORMAT(F10,0)
00098 . . . CALL STOPSB (MESS2,LPLAB)
00099 . . . IF (ID1.EQ.1) CALL STOPSB (IOUT1)
00100 . . . CALL SUBOF (IOUT2,100)
00101 . . . CALL CHRSC (1)
00102 . . . CALL APOS (0,950)
00103 . . . CALL TEXT ('PLOT SCALE =')
00104 . . . CALL APOS (105,950)
00105 . . . CALL FNMOR (FACT,'(F6,2)')
00106 . . . CALL ENDSB
00107 . . . CALL VOFIL (3,'DII(351,200)MAPSU,DSP',MAIN,ICC,FACT,0,0,1)
00108 . . . CALL STRTSB (LPLAB)
00109 . . . ID2 = 1
00110 . . . FIN
00111 . . (3)
00112 . . . IF (ID.EQ.3) STOP
00113 . . . FIN
00114 . . . FIN
00115 . . FIN
00116 GO TO 19

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00117      TO READ=DATA=AND=DISPLAY=MAP
00118      C      .
00119      C ** DRAW BOUNDARY AROUND MAP
00120      .      CALL SUBOF (MAP,3000,0)
00121      .      IX2 = XMAX*OSCALE
00122      .      IY2 = YMAX*OSCALE
00123      .      CALL APOS (0,0)
00124      .      CALL VEC (0,IY2)
00125      .      CALL VEC (IX2,IY2)
00126      .      CALL VEC (IX2,0)
00127      .      CALL VEC (0,0)
00128      C      .
00129      .      NREC = 0
00130      10      .      READ (3,300,END=50) CARD
00131      300      .      FORMAT(35A1)
00132      .      NREC = NREC + 1
00133      .      CONDITIONAL
00134      .      (CARD(1).EQ.'L')
00135      .      .      DECODE (35,401,CARD) EL,IPEN,(CHAR(I),I=1,30)
00136      7 36 401      .      .      FORMAT(A1,I4,30A1)
00137      .      .      READ (3,302) XC,YC,SIZ,ROT
00138      302      .      .      FORMAT(5X,4F10,1)
00139      .      .      IX = XC*OSCALE
00140      .      .      IY = YC*OSCALE
00141      .      .      CALL INTENS (IPEN)
00142      .      .      CALL CHRSCS (0)
00143      .      .      CALL APOS (IX,IY)
00144      .      .      NCHR = ICHR2(CHAR)
00145      .      .      CALL TEXT (CHAR,0,NCHR)
00146      .      .      ...FIN
00147      .      (CARD(1).EQ.'R')
00148      .      .      DECODE (10,402,CARD) RR,IPEN,ISTAR
00149      402      .      .      FORMAT(A1,I4,I5)
00150      .      .      READ (3,302) XC,YC,SIZ,ROT
00151      .      .      IX = XC*OSCALE - 2.
00152      .      .      IY = YC*OSCALE - 5.
00153      .      .      CALL INTENS (IPEN)
00154      .      .      CALL CHRSCS (0)
00155      .      .      CALL APOS (IX,IY)
00156      .      .      CALL TEXT ('*',0)
00157      .      .      ...FIN
00158      .      (OTHERWISE)
00159      .      .      DECODE (40,403,CARD) NPTS,IPEN,IOP
00160      403      .      .      FORMAT(3I5)
00161      6 61      .      .      READ (3,303) (X(L),Y(L),L=1,NPTS)
00162      6 62 303      .      .      FORMAT(8F10,2)
00163      C      .      .
00164      .      .      INT = 3
00165      .      .      IF (IPEN.EQ.2) INT = 5
00166      7 66      .      .      IF (IPEN.EQ.3) INT = 7
00167      .      .      CALL INTENS (INT)
00168      .      .      DO (J=1,NPTS)
00169      .      .      .      IX = ABS(X(J))*USCALE
00170      .      .      .      IY = Y(J)*USCALE
00171      .      .      .      WHEN (X(J).LT.0.,.OR.,J.EQ.1)
00172      .      .      .      .      CALL APOS (IX,IY)
00173      .      .      .      ...FIN
00174      .      .      .      ELSE
00175      .      .      .      .      CALL VEC (IX,IY)
00176      .      .      .      ...FIN
00177      .      .      .      ...FIN
00178      .      .      .      ...FIN
00179      .      .      .      ...FIN

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00180      . IF (PAUS.EQ.'Y')
00181      . . WRITE (5,540) NREC
00182 540      . . FORMAT(' NREC = ',I4)
00183      . . READ (5,502,END=550)
00184      . ...FIN
00185      . GO TO 10
00186 50      . CALL ENOSB(152)
00187      . WRITE(5,550) 152
00188 550      . FORMAT(//,' ISZ = ',I5,///)
00189      . CLOSE (UNIT=3)
00190      . ...FIN
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00191      TO SETUP=DISPLAY=FILES
00192      . CALL SUBOF (LPLA0,200)
00193      . CALL AREA (1)
00194      . CALL INTENS (2)
00195      . CALL CHRSCl (0)
00196      . CALL APOS (3,855)
00197      . CALL BOX (155,17)
00198      . CALL INTENS (5)
00199      . CALL APOS (0,850)
00200      . CALL BOX (170,27)
00201      . CALL APOS (25,860)
00202      . CALL TEXT ('LIGHT PEN OPTIONS:',-3)
00203      . CALL MENU (800,40,1,' WRITE DISPLAY FILE',
00204 1.      . ' WRITE PLOT FILE', ' STOP PROGRAM')
00205      . CALL ENOSB
00206 C      .
00207      . CALL SUBOF (MESS1,60,1)
00208      . CALL AREA (1)
00209      . CALL INTENS (4)
00210      . CALL CHRSCl (0)
00211      . CALL BLINK (1)
00212      . CALL APOS (0,100)
00213      . CALL TEXT ('ENTER OUTPUT MAP DISPLAY NAME,EXT')
00214      . CALL BLINK (0)
00215      . CALL AREA (0)
00216      . CALL ENOSB
00217 C      .
00218      . CALL SUBOF (MESS2,60,1)
00219      . CALL AREA (1)
00220      . CALL INTENS (4)
00221      . CALL CHRSCl (0)
00222      . CALL BLINK (1)
00223      . CALL APOS (0,100)
00224      . CALL TEXT ('ENTER CALCOMP PLOT SCALE (F10.4)')
00225      . CALL BLINK (0)
00226      . CALL AREA (0)
00227      . CALL ENOSB
00228      . ...FIN
00229      ENO
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PROCEDURE CROSS-REFERENCE TABLE

00117 READ=DATA=AND=DISPLAY=MAP
00064

00191 SETUP=DISPLAY=FILES
00063

(FLECS VERSION 22,46)

Formatted Map File. Output From
MAPDRW and Input to MAPSU.
(WIPPMAP.FOR)

17	3	1						
2382.8	65256.4	2424.6	66099.1	1839.4	68140.9	1881.2	69018.8	
2633.7	69144.2	2717.3	69980.3	3846.0	69896.7	4598.5	69436.8	
5952.6	69395.0	6103.4	68015.5	6730.5	67890.1	6688.7	67597.4	
6354.2	67513.8	6354.2	66886.8	6019.8	66803.1	5894.4	65172.8	
2341.0	65298.2							
5	1	1						
87621.6	107144.2	108482.0	107186.0	108482.0	86618.3	87412.6	86743.8	
87579.8	107186.0							
5	1							
76200.0	60700.0	76200.0	55400.0	70800.0	55400.0	70800.0	60700.0	
76200.0	60700.0							
93	3	1						
27925.2	74913.2	28928.5	74620.5	29430.2	74955.0	29012.1	75832.9	
28635.9	76919.8	28552.3	77630.4	29555.6	77755.9	30266.3	77421.4	
31102.3	78215.7	30935.1	78801.0	31227.8	78842.8	31687.6	78675.5	
33025.3	79219.0	33234.4	80096.9	34195.9	80096.9	34404.9	81267.4	
34948.3	81476.4	35241.0	82730.6	35742.6	82730.6	36286.1	82145.3	
37665.6	81894.5	38710.7	82145.3	40299.3	81309.2	41135.4	80347.7	
41637.0	79511.6	41302.6	79135.4	40550.1	79720.6	40341.1	78215.7	
39546.8	77672.2	39463.2	77087.0	39630.4	76752.5	40424.7	76501.7	
40006.6	75540.2	39126.8	75456.6	39045.1	75038.6	38501.7	74996.8	
37832.8	75038.6	37414.8	74745.9	37080.3	74035.3	37164.0	73742.6	
36745.9	73575.4	36035.2	73408.2	36077.0	73157.4	36745.9	72655.7	
36745.9	71861.5	37122.1	71610.6	37456.6	72070.5	37916.4	71694.2	
37665.6	70690.9	37456.6	69940.3	37958.2	69645.8	39337.8	70900.0	
39797.6	70732.7	40257.5	70816.4	40215.7	69938.5	39923.0	68851.6	
39337.8	68391.7	39379.6	68099.1	40048.4	67848.3	39839.4	67304.8	
39254.2	67263.0	38836.1	67764.6	38459.9	67095.8	38125.4	67597.4	
36996.7	68266.3	36369.7	68391.7	36327.9	67806.4	37540.2	66844.9	
37414.8	66176.1	37038.5	66426.9	35826.2	67095.8	34572.1	67973.7	
34154.0	68809.7	34112.2	69520.4	33443.4	69938.5	32690.9	69854.9	
32105.6	69813.0	32189.2	70565.5	32231.1	71025.4	31729.4	71443.4	
31729.4	72572.1	31729.4	73533.6	31436.8	73951.7	30851.5	73742.6	
29973.6	73241.0	29179.3	72990.2	28761.3	72613.9	28552.3	72655.7	
28510.5	73324.6	27758.0	73659.0	27549.0	73951.7	27674.4	74536.9	
27674.4	74871.4							
19	3	1						
26127.6	52924.1	26587.5	52673.3	26963.7	51920.8	25751.4	50750.3	
25166.1	50624.9	25207.9	50123.3	26127.6	50332.3	26754.7	49914.2	
26921.9	49245.4	26545.7	48910.9	25542.4	48743.7	24789.9	48534.7	
24748.1	49412.6	24162.8	50081.5	24371.9	50917.5	25375.2	51419.2	
25709.6	52213.5	25835.0	52756.9	26169.4	52965.9			
30	3	1						
11872.4	36327.9	12750.3	35366.4	12332.2	34655.7	12165.0	33903.2	
12541.3	33443.4	12708.5	33359.8	13419.2	31938.4	13335.5	31436.8	
12374.0	31395.0	12039.6	31185.9	12206.4	30475.3	11830.6	30224.5	
10994.5	30308.1	10325.6	30099.0	10158.4	29555.6	9865.8	29472.0	
9531.4	30099.0	9029.7	30433.5	9531.4	31185.9	9949.4	30726.1	
10451.1	30935.1	10492.9	31353.2	10994.5	31269.6	10994.5	31478.6	
10660.1	31687.6	10910.9	32649.1	10994.5	34154.0	10994.5	35157.4	
11538.0	35742.6	11914.2	36280.1					
14	3	1						
11579.8	418.0	11538.0	125.4	11370.7	2424.6	11287.1	21905.4	
14213.4	33108.9	11747.0	44270.7	11788.8	45608.4	11287.1	46695.3	
7106.7	52631.5	6981.3	53467.6	6981.3	58693.1	6563.3	59278.4	
2550.1	62330.1	2591.9	65298.2					
6	3	1						
2800.9	69018.8	2633.7	69854.9	2341.0	70481.9	836.1	72530.3	
459.8	72739.3	0.0	73199.2					
33	3	1						
167.2	77254.2	459.8	77296.0	12708.5	77379.6	13586.4	77128.8	
15342.1	76459.9	17014.3	76961.6	27172.7	81518.2	28719.5	82814.2	
32314.7	86243.9	33318.0	87496.2	35031.9	90589.8	40257.5	97947.3	
40800.9	99410.4	41093.6	102211.3	40968.1	103381.8	41887.8	105890.1	
42431.3	106433.5	48409.3	108440.1	49078.2	108941.8	49412.6	110070.5	
51586.4	115672.3	53300.4	118807.6	54888.9	121524.9	55056.2	122737.2	
53467.6	129175.0	50374.1	141005.6	49788.8	142134.3	48033.1	142970.4	
47364.2	143722.9	42180.5	150119.0	40257.5	151582.1	39337.8	152292.8	
36710.7	152836.2							

37	3	1						
501.7	139542.5	836.1	139751.5	1086.9	139960.5	7608.4	145562.3	
12206.8	149448.3	14464.3	150829.6	20275.0	154341.2	22657.9	155469.9	
25375.2	156442.2	26127.6	156640.4	30558.9	155720.7	35157.4	153797.7	
38125.4	152878.0	38752.5	152794.4	39379.6	152585.4	40213.7	152501.8	
43183.8	152460.0	45441.2	152042.0	48033.1	151205.9	49663.4	151122.3	
53718.4	151791.1	56268.5	152000.1	59487.4	152627.2	63626.0	152794.4	
67806.4	153337.9	70732.7	153580.7	76501.7	153797.7	84235.5	154466.6	
88415.9	155010.0	95857.1	155428.1	106015.5	160277.4	111115.6	162075.0	
116413.3	164248.8	119351.1	164708.6	126666.8	167467.7	132059.5	169725.1	
140754.8	174240.0							
9	3	1						
117887.9	164332.4	118140.5	163496.3	118640.4	163245.5	126834.0	162200.4	
124924.2	161197.1	136407.2	156849.4	143263.1	152794.4	144099.2	152710.8	
173069.5	152752.6							
21	3	1						
174114.6	39755.8	167258.7	39755.8	150746.0	39923.0	143639.3	39630.4	
135153.0	41678.8	134693.2	41595.2	126959.4	42849.3	125370.9	43936.2	
111157.4	56435.7	93307.0	71986.9	91342.2	73826.3	89084.8	77672.2	
86702.0	80849.4	83901.1	81978.1	75791.1	83065.0	61285.0	84946.2	
55599.6	85531.4	49538.0	86367.5	41762.4	87412.6	35868.0	87412.6	
33527.0	87454.4							
5	3	1						
135069.4	-125.4	135069.4	7399.3	134985.8	20442.3	134985.8	31938.4	
134776.8	41637.0							
5	3	1						
209.0	45692.0	3051.7	45692.0	5643.6	45566.6	10367.4	45566.6	
11788.8	45566.6							
9	3	1						
41300.0	174240.0	41093.6	173989.2	39923.0	170561.2	38250.9	166715.2	
35826.2	162075.0	34655.7	159733.9	32690.9	157685.5	31269.6	156431.4	
30767.9	155888.0							
4	1	1						
118891.2	83.6	118550.8	152669.0	91300.4	152585.4	91300.4	174114.6	
113	1	1						
710.7	94979.2	1295.9	94603.0	1755.8	92972.6	2800.9	92052.9	
5058.3	90966.0	6228.8	90297.1	6270.6	89043.0	5141.9	87872.5	
2550.1	86827.4	1505.0	86283.9	794.3	85615.0	627.1	85113.4	
627.1	85029.8	752.5	84235.5	961.5	83274.0	2215.6	82187.1	
4305.8	81601.8	5016.5	82187.1	5392.7	83023.2	8653.5	83650.2	
10743.7	84235.5	12541.3	85029.8	13753.6	85238.8	14046.2	84737.1	
15258.5	83984.7	16052.8	82939.0	16554.5	81810.9	16679.9	80514.9	
16220.0	79344.4	16261.8	79010.0	16011.0	78048.5	16345.5	77254.2	
17975.8	75582.0	19522.6	73951.7	20316.9	72530.3	21236.5	71359.8	
22908.7	69729.4	24121.0	67722.8	24915.3	67095.8	26838.3	65507.2	
27883.4	64545.7	28217.8	63040.8	27758.0	61577.6	27423.6	60783.3	
26044.0	59863.6	25082.5	59487.4	24455.5	58233.3	24162.8	56686.5	
22866.9	55850.4	21821.8	55307.0	21027.5	53384.0	20024.2	52171.7	
19480.8	50624.9	20651.3	49078.2	22407.1	47364.2	24330.1	46193.7	
25876.8	45315.8	27084.1	44897.7	27632.6	44270.7	26253.1	43225.6	
25124.3	42180.5	24497.3	41219.0	25040.7	40382.9	26336.7	39588.6	
28426.9	40215.7	30726.1	42055.1	32858.1	43183.8	35784.4	43601.8	
37122.1	43016.5	38000.0	41553.4	37080.3	40382.9	34572.1	39923.0	
33401.6	39045.1	33150.7	37623.8	33485.2	36369.7	34446.7	35282.8	
36035.2	33945.0	38543.5	33108.4	41051.7	32732.7	42431.3	32231.1	
42932.9	31436.8	42891.1	31018.7	39881.2	29472.0	37665.6	28176.0	
36411.5	27214.5	34864.7	27674.4	34154.0	28426.9	33318.0	28008.8	
32858.1	27340.0	31345.0	26253.1	30976.9	24580.9	29388.4	22365.3	
27298.2	20525.9	25876.4	19146.3	25375.2	18268.4	25291.6	16429.1	
25375.2	14840.5	25876.5	14338.8	27632.6	14673.3	28761.3	14673.3	
29346.6	13670.0	28761.3	11078.1	27799.8	9573.2	25333.4	9698.6	
23075.9	10367.4	21612.8	9364.1	20943.9	7942.8	21780.0	6396.0	
22490.7	4305.8	22281.7	2759.1	21863.6	1045.1	21780.0	376.2	
21863.6	41.8							
9	1	1						
16387.3	79010.0	17056.1	79511.6	17390.6	80347.7	17223.3	81601.8	
16805.3	82939.6	15676.6	84360.9	14756.9	85029.8	13962.6	85322.4	
13335.5	85238.8							

1PECOS RIVER				
6563.3	85824.1	0.1	0.0	
1WIPP SITE				
89628.3	96316.9	0.1	0.0	
1GNOME SITE				
69102.4	62789.9	0.1	0.0	
1LEA COUNTY				
102169.5	154257.6	0.1	0.0	
1EUDY COUNTY				
93892.3	147485.3	0.1	0.0	
1LOVING				
7273.9	67472.0	0.1	0.0	
1SALT LAKE				
39672.2	72321.3	0.1	0.0	
1WILLOW LAKE				
14798.7	31562.2	0.1	0.0	
1X				
24027.3	166.9	0.1	0.0	
1X				
55146.1	166.9	0.1	0.0	
1X				
87224.3	166.9	0.1	0.0	
1X				
118718.5	166.9	0.1	0.0	
1X				
150671.5	166.9	0.1	0.0	
1X				
173948.0	23610.2	0.1	0.0	
1X				
173781.1	55396.4	0.1	0.0	
1X				
173530.9	86431.7	0.1	0.0	
1X				
173530.9	118760.2	0.1	0.0	
1X				
173405.7	152798.9	0.1	0.0	
1X				
153758.4	173072.0	0.1	0.0	
1X				
122222.5	172279.4	0.1	0.0	
1X				
91187.1	172905.1	0.1	0.0	
1X				
58900.4	173697.7	0.1	0.0	
1X				
28365.6	173489.1	0.1	0.0	
1X				
1251.4	153800.1	0.1	0.0	
1X				
1042.9	119636.2	0.1	0.0	
1X				
750.9	87766.6	0.1	0.0	
1X				
584.0	55980.4	0.1	0.0	
1X				
375.4	23985.6	0.1	0.0	

1+	24194.2	23860.5	0.1	0.0
1+	55146.1	23485.1	0.1	0.0
1+	87266.0	23401.6	0.1	0.0
1+	118718.5	23401.6	0.1	0.0
1+	150629.8	23526.8	0.1	0.0
1+	150546.4	55146.1	0.1	0.0
1+	118551.6	55021.0	0.1	0.0
1+	87266.0	55146.1	0.1	0.0
1+	54979.2	55438.1	0.1	0.0
1+	24444.5	55855.2	0.1	0.0
1+	24486.2	87474.6	0.1	0.0
1+	55062.7	86848.9	0.1	0.0
1+	87349.4	86807.1	0.1	0.0
1+	118635.0	86181.4	0.1	0.0
1+	150713.2	86264.9	0.1	0.0
1+	150546.4	118551.6	0.1	0.0
1+	118468.2	118259.6	0.1	0.0
1+	87266.0	118551.6	0.1	0.0
1+	55104.4	118801.9	0.1	0.0
1+	24444.5	119260.8	0.1	0.0
1+	24444.5	153257.8	0.1	0.0
1+	28031.9	153382.9	0.1	0.0
1+	55271.3	152548.6	0.1	0.0
1+	58942.1	152423.5	0.1	0.0
1+	87391.1	152340.1	0.1	0.0
1+	91270.0	152381.8	0.1	0.0
1+	118343.0	152465.2	0.1	0.0
1+	122222.5	152465.2	0.1	0.0
1+	150337.8	152632.1	0.1	0.0
1+	153800.1	152590.4	0.1	0.0

Calcomp Plot of Displayed WIPP
Site Background Map. Output
from MAPSU (MAPSU.DSP)

To Plot:
PLE WLR45_XY:=MAPSU.DSP/IM

PLOT SCALE = 0.65

0.65

WLGSMRY

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-----
00001 C ***** (220,101)WLGSMRY,FLX *****
00002 C
00003 C
00004 C PROGRAM ID: CIRMIS-11-UTL-3-2 "WIPP SITE 11/55"
00005 C
00006 C PROGRAM DESCRIPTION:
00007 C THIS PROGRAM PRINTS STRATOGRAHIC SUMMARY OF ALL
00008 C WELLS WITH A DRILLERS LOG,
00009 C
00010 C DATA FILES:
00011 C NAME LUN TYPE ACCESS
00012 C
00013 C DB0:(FILEQ)--WELLHOR 1 RAN R
00014 C DB0:(FILEQ)--FRMTWLG 1 RAN R
00015 C DI:(220,101)WELHORWIP,SEQ 2 FOR R
00016 C DI:(220,101)STRATA,FOR 3 FOR W
00017 C DI:(220,101)STRATA,BIN 4 BIN W
00018 C DI:(220,101)STRATA,LST 6 FOR W
00019 C DI:(220,101)STRATBIN,LST 3 FOR W
00020 C
00021 C
00022 C MCR>TKB # (220,101)WLGSMRY
00023 C
00024 C
00025 C BATTELLE MEMORIAL INSTITUTE
00026 C PACIFIC NORTHWEST LABORATORIES
00027 C WATER & LAND RESOURCES DEPT.
00028 C
00029 C AUTHOR(S): DR FRIEDRICH
00030 C
00031 C DATE: INITIAL VERSION MAY 1978
00032 C CURRENT VERSION JANUARY 1979
00033 C
00034 C
00035 C
00036 C BYTE WLOES, DAT(9), TIM(8), WNAME(12), WOLD(12), CMPLT
00037 C LOGICAL MATCH
00038 C
00039 C DIMENSION EXPL(20), INODE(256), ODATE(2)
00040 C DIMENSION NDM(4000), NBUF(256), STRAT(20)
00041 C DIMENSION ODD(50), SSS(20,50), NCODE(50)
00042 C
00043 C COMMON/HOR/ WLOES(12),IDM1(6),XC,YC,CASE,IDBIT,IDM2(20),IBLK,
00044 C 1 NSTR,NWRD,IDM3(187),OWN(6),ORL(6),IDM4(3)
00045 C COMMON/BLK2/ BUF(2000)
00046 C
00047 C EQUIVALENCE (BUF(1),NDM(1)), (INODE(1),WLOES(1))
00048 C DATA BLANKS /" "/
00049 C
00050 C
00051 C
00052 C WRITE(5,501)
00053 S01 FORMAT('S WRITE A COMPLETE BINARY FILE WITH NAMES? (Y OR N)>')
00054 READ (5,502) CMPLT
00055 S02 FORMAT(A1)
00056 NWELL = 0
00057 NSTR = 0
00058 DEPMAX = 0.0
00059 C
00060 C
00061 C CALL ASNLUN(1,'DB',0)
00062 C CALL DPFIL(1,'WELLHOR',6000.,IPNT0)
00063 C CALL DPFIL(1,'FRMTWLG',8000.,IPNT1)
00064 C

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00065      OPEN (UNIT=2,NAME='DI1[220,101]WELHORWIP.SEG',TYPE='OLD',
00066      1READONLY)
00067      OPEN (UNIT=3,NAME='DI1STRATA.FOR',TYPE='NEW')
00068      OPEN (UNIT=4,NAME='DI1STRATA.BIN',TYPE='NEW',FORM='UNFORMATTED')
00069      OPEN (UNIT=6,NAME='DI1STRATA.LST',TYPE='NEW')
00070  C
00071      ITYPE = 0
00072  C
00073  C 00 DUMMY READ ON FIRST LINE
00074      READ (2,206)
00075  C
00076  10  READ (2,206,END=90) WLOES,FQADR
00077  206  FORMAT(1X,12A1,F10.0)
00078      CALL DPR (IPNT0,FQADR,INODE,256.)
00079      IBIT = IFLO(3,1,IOBIT)
00080      IF (IBIT.EQ.0) GO TO 10
00081  C      IF (NWELL.GT.20) GO TO 90
00082      NWELL = NWELL+1
00083      NWORD = NWORD
00084      KBLK = IBLK
00085      JB = NSTRT
00086      STRT = KBLK
00087      CALL DPR(IPNT1,STRT,NBUF,256.)
00088      DO (J=1,NWORD)
00089      .   JB = JB+1
00090      .   NDUM(J) = NBUF(JB)
00091      .   IF (JB.GE.256)
00092      .   .   KBLK = KBLK+1
00093      .   .   STRT = KBLK
00094      .   .   CALL DPR(IPNT1,STRT,NBUF,256.)
00095      .   JB = 0
00096      .   ...FIN
00097      ...FIN
00098  C
00099      NTOT = BUF(4)
00100      DDATE(1) = BUF(5)
00101      DDATE(2) = BUF(6)
00102      TOTDEP = BUF(7)
00103      N = 7
00104      IF (TOTDEP.GT.DEPMAX)
00105      .   DEPMAX = TOTDEP
00106      .   DO (J=1,12) WNAME(J)=WLOES(J)
00107      .   ...FIN
00108  C
00109  C
00110  C
00111  C
00112  C ***** READ DATA FROM BUFFER *****
00113  C
00114  20  N = N+1
00115      IF (N.GT.NTOT)
00116      .   WRITE(5,520) WLOES
00117  520 .   FORMAT(' ERROR IN DATA LENGTH. WELL NO. ',12A1)
00118      .   STOP
00119      .   ...FIN
00120      I1 = BUF(N)
00121      SELECT (I1)
00122  C  CARD TYPE 1---HEADER INFO
00123      .   (1)
00124      .   .   WRITE(6,624) WLOES,TOTDEP,CASE
00125  624 .   .   FORMAT(//,15X,'*** ',12A1,' ***',//,' TOTAL DEPTH: ',F7.1,
00126      1.   .   ' CASING ELEVATION:',F7.1,/,8X,' START DEPTH      STRATA',
00127      2.   .   /,8X,'-----'      '-----')
00128  C      .

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00129      . . IF (ITYPE,NE,0)
00130      . . . WRITE(4) WOLD,TD,CS,XXC,YYC,KSTRAT
00131      . . . DO (J=1,KSTRAT)
00132      . . . . WHEN (CMPLT,EQ,'Y')
00133      . . . . . WRITE(4) DDD(J),NCODE(J),(SSS(K,J),K=1,20)
00134      . . . . . ...FIN
00135      . . . . ELSE
00136      . . . . . WRITE(4) DDD(J),NCODE(J)
00137      . . . . . ...FIN
00138      . . . . ...FIN
00139      . . . . ...FIN
00140      . . . KSTRAT = J
00141      . . . ITYPE = 1
00142      . . . DO (J=1,12) WOLD(J)=WLOES(J)
00143      . . . TD = TOTDEP
00144      . . . CS = CASE
00145      . . . XXC = XC
00146      . . . YYC = YC
00147      . . . ...FIN
00148      C
00149      C CARD TYPE 2---STRATIFICATION
00150      . (2)
00151      . . KSTRAT = KSTRAT+1
00152      . . IF (KSTRAT,GE,45)
00153      C . . . WRITE(5,524) WLOES,KSTRAT
00154      524 . . . . FORMAT(' WLOES,KSTRAT= ',12A1,15)
00155      . . . . ...FIN
00156      . . . N = N+1
00157      . . . TIM2 = BUF(N)
00158      . . . N = N+1
00159      . . . DEPTH = BUF(N)
00160      . . . N = N+1
00161      . . . ISAMP = BUF(N)
00162      . . . N = N+1
00163      . . . ICONT = BUF(N)
00164      . . . N = N+1
00165      . . . NEXPL = BUF(N)
00166      . . . DO (J=1,20) EXPL(J)=BLANKS
00167      . . . IF (NEXPL,NE,0)
00168      . . . . DO (J=1,NEXPL)
00169      . . . . . N = N+1
00170      . . . . . EXPL(J) = BUF(N)
00171      . . . . . ...FIN
00172      . . . ...FIN
00173      . . . DDD(KSTRAT) = DEPTH
00174      . . . FIND=AND=STORE=STRATA=CODE
00175      . . . DO (J=1,20)
00176      . . . . SSS(J,KSTRAT) = EXPL(J)
00177      . . . . ...FIN
00178      . . . . WRITE(6,626) DEPTH, (EXPL(J),J = 1,NEXPL)
00179      626 . . . . . FORMAT(8X,F7.1,10X,20A4)
00180      . . . . WHEN (NSTR,EQ,0)
00181      . . . . . NSTR = 1
00182      . . . . . WRITE (3,326) EXPL
00183      326 . . . . . FORMAT(1X,20A4)
00184      . . . . . ...FIN
00185      . . . ELSE
00186      . . . . REWIND (3)
00187      . . . . MATCH = .FALSE.
00188      . . . . DO (K=1,NSTR)
00189      . . . . . READ(3,326) STRAT
00190      . . . . . DO (J=1,20)
00191      . . . . . . IF (STRAT(J),NE,EXPL(J)) GO TO 40
00192      . . . . . . ...FIN

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00193      . . . . MATCH = .TRUE.
00194 40      . . . . CONTINUE
00195      . . . . FIN
00196      . . . . IF (.NOT.MATCH)
00197      . . . . WRITE (3,326) EXPL
00198      . . . . NSTR = NSTR+1
00199      . . . . FIN
00200      . . . . FIN
00201      . . . . FIN
00202 C
00203 C CARD TYPE 3---SOILS
00204      . (3)
00205      . N = N+3
00206      . NSOIL = BUF(N)
00207      . N = N+NSOIL
00208      . ...FIN
00209 C
00210 C CARD TYPE 4---COMMENTS
00211      . (4)
00212      . N = N+4
00213      . NCOM = BUF(N)
00214      . N = N+NCOM
00215      . ...FIN
00216 C
00217 C CARD TYPE 5---END OF DATA
00218      . (5)
00219      . IF (I1.EQ.5) GO TO 10
00220      . ...FIN
00221      . ...FIN
00222      GO TO 20
00223 C
00224 C
00225 90      CLOSE (UNIT=3)
00226      WRITE(6,660) NWEEL,NAME,DEPMAX
00227 660      FORMAT(///,' TOTAL WELLS WITH DRILLERS LOGS =',I5,
00228 1/, ' DEEPEST WELL = ',I2A1,' AT',F8.1,' FEET')
00229 C
00230      IF (ITYPE.NE.0)
00231      . WRITE(4) WOLD,TD,CS,XXC,YYC,KSTRAT
00232      . DO (J=1,KSTRAT)
00233      . . WHEN (CMPLT.EQ.'Y')
00234      . . . WRITE(4) DDD(J),(SSS(K,J),K=1,20)
00235      . . . ...FIN
00236      . . ELSE
00237      . . . WRITE(4) DDD(J),NCODE(J)
00238      . . . ...FIN
00239      . . ...FIN
00240      . ...FIN
00241      CLOSE (UNIT=4)
00242      CLOSE (UNIT=3)
00243      IF (CMPLT.NE.'Y')
00244      . OPEN (UNIT=4,NAME='DIISTRAT8IN',TYPE='OLD',FORM='UNFORMATTED',
00245 1. READONLY)
00246      . OPEN (UNIT=3,NAME='DIISTRAT8IN.LST',TYPE='NEW')
00247 C
00248 95      . READ(4,END=98) WLDL,TD,CS,XXC,YYC,KSTRAT
00249      . DO (J=1,KSTRAT)
00250      . . READ (4) DDD(J),NCODE(J)
00251      . . ...FIN

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00252      . WRITE(3,395) WLOES,TD,CS,XXC,YYC
00253 395      . FORMAT(///,3X,12A1,' DEPTH=',F8.1,' CASING=',F8.1,' X=',
00254      1. F9.0,' Y=',F9.0,/)
00255      . DO (J=1,KSTRAT)
00256      . . WRITE (3,396) OOO(J),NCODE(J)
00257 396      . . FORMAT(5X,F9.2,5X,15)
00258      . ...FIN
00259      . GO TO 95
00260      . ...FIN
00261 C
00262 98      STOP

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00263      TO FIND-AND-STORE-STRATA-CODE
00264      NCODE(KSTRAT) = 999
00265      . SELECT (EXPL(1))
00266      . . ('OGAL') NCODE(KSTRAT) = 101
00267      . . ('MOLO') NCODE(KSTRAT) = 102
00268      . . ('CRET') NCODE(KSTRAT) = 201
00269      . . ('GATU') NCODE(KSTRAT) = 302
00270      . . ('SANT') NCODE(KSTRAT) = 303
00271      . . ('TRIA') NCODE(KSTRAT) = 304
00272      . . ('DEWE') NCODE(KSTRAT) = 401
00273      . . ('RUST') NCODE(KSTRAT) = 402
00274      . . ('SALA') NCODE(KSTRAT) = 403
00275      . . ('CAST') NCODE(KSTRAT) = 404
00276      . . ('TANS') NCODE(KSTRAT) = 405
00277      . . ('YATE') NCODE(KSTRAT) = 406
00278      . . ('CAPI') NCODE(KSTRAT) = 407
00279      . . ('SAN ') NCODE(KSTRAT) = 408
00280      . . ('GLOR') NCODE(KSTRAT) = 409
00281      . . ('OELA') NCODE(KSTRAT) = 410
00282      . . ('LEON') NCODE(KSTRAT) = 411
00283      . . ('WOLF') NCODE(KSTRAT) = 412
00284      . . ('PEHM') NCODE(KSTRAT) = 413
00285      . . ('DETR') NCODE(KSTRAT) = 500
00286      . . ('STRA') NCODE(KSTRAT) = 501
00287      . . ('UPPE') NCODE(KSTRAT) = 501
00288      . . ('ATOK') NCODE(KSTRAT) = 502
00289      . . ('MORR') NCODE(KSTRAT) = 503
00290      . . ('PENN') NCODE(KSTRAT) = 504
00291      . . ('BARN') NCODE(KSTRAT) = 601
00292      . . ('MISS') NCODE(KSTRAT) = 602
00293      . . ('WOOD') NCODE(KSTRAT) = 701
00294      . . ('DEVO') NCODE(KSTRAT) = 702
00295      . . ('SILU') NCODE(KSTRAT) = 801
00296      . . ('MONT') NCODE(KSTRAT) = 901
00297      . . ('SIMP') NCODE(KSTRAT) = 902
00298      . . ('ELLE') NCODE(KSTRAT) = 903
00299      . . ('OROO') NCODE(KSTRAT) = 904
00300      . . ('PREC') NCODE(KSTRAT) = 950
00301      . ...FIN
00302      . ...FIN
00303      END

```

PROCEDURE CROSS-REFERENCE TABLE

00263 FIND-AND-STORE-STRATA-CODE
00174

(FLECS VERSION 22,46)

WIPP Site Formatted Well Header Input File
(WECHDRWIP.SEQ)

"WELHORWIP, SEQ", NEW CIRMIS USING SEQ, SEARCH, 19-DEC-78				06140131	
1-SAND-18	2100.	I-375	428.	W6	1479.
49ER RIDGE	2310.	I-376	429.	W6	1480.
'A-2	0.	-377	430.	W7	1481.
.EC-7	1.	I-383	431.	W8	1482.
AEC-8	2.	I-384	432.	'9	1483.
8AS-1	3.	I-385	433.	.10	1484.
BAVERDORF-1	4.	I-411	434.	W11	1485.
B-1	5.	I-440	435.	W12(JR=1)	1486.
CB-1	6.	I-442	436.	W13	1487.
CM-1	7.	I-443	437.	W14	1488.
COTTON BABY	8.	I-444	438.	W15	1489.
C-1	9.	I-445	439.	W16	1490.
D-TSS	210.	I-446	440.	W17	1491.
D-1	211.	I-447	441.	W18	1492.
D-18	212.	I-448	442.	W19	1493.
D-19	213.	I-449	443.	W20	1494.
D-31	214.	I-450	444.	W21	1495.
D-36	215.	I-453	445.	W22	1496.
D-48	216.	I-454	446.	W23	1497.
D-82	217.	I-456	447.	W24	1498.
D-96	218.	I-457	448.	W25	1499.
D-104	219.	I-458	449.	W26	1500.
D-120	220.	I-459	450.	W27	1501.
D-121	221.	J-A	630.	W28	1502.
D-123	222.	J-E	631.	W29	1503.
D-160	223.	JEN-1	632.	W30	1504.
D-176	224.	JR-3	633.	W31	1505.
D-177	225.	'R-7	634.	W32	1506.
-179	226.	MONTGOMERY-1	840.	W33	1507.
J-180	227.	PP-6	1050.	W34	1508.
D-181	228.	PP-7	1051.	35	1509.
D-188	229.	PP-17	1052.	436	1510.
D-189	230.	PP-19	1053.	W37	1511.
D-197	231.	PP-20	1054.		
D-198	232.	P-1	1055.		
D-202	233.	P-2	1056.		
D-203	234.	P-3	1057.		
D-207	235.	P-4	1058.		
D-227	236.	P-5	1059.		
D-229	237.	P-6	1060.		
D-230	238.	P-7	1061.		
D-232	239.	P-8	1062.		
ERDA-6	240.	P-9	1063.		
ERDA-9	241.	P-10	1064.		
F-1	242.	P-11	1065.		
F-2	243.	P-12	1066.		
F-52	244.	P-13	1067.		
F-70	245.	P-14	1068.		
F-81	246.	P-15	1069.		
F-82	247.	P-16	1070.		
F-91	248.	P-17	1071.		
F-92	249.	P-18	1072.		
FC-63	250.	P-19	1073.		
FC-65	251.	P-20	1074.		
C-68	252.	P-21	1075.		
FC-69	253.	V-134	1478.		
FED-1	254.	V-160	1471.		
FED-5	255.	WRT-1	1472.		
G-1	420.	W-7	1473.		
HUDSON FED	421.	W1	1474.		
I-123	422.	W2	1475.		
I-278	423.	W3	1476.		
I-369	424.	W4	1477.		
I-370	425.	W5	1478.		
I-373A	426.				
I-374	427.				

WIPP Site Strate Name Output Listing
(STRATA.LST)

*** 1-3AND-18 ***	
TOTAL DEPTH: 15500.0	CASING ELEVATION: 3588.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
120.0	DEWEY LAKE
777.0	RUSTLER DOLOMITE AND ANHYDRITE
1316.0	SALADO EVAPORITES
3098.0	CASTILE ANHYDRITE
4635.0	DELAWARE MT. GROUP
11506.0	WOLFCAMP SERIES
13575.0	STRAWN SERIES
13754.0	ATOKA SERIES
14412.0	MORROW SERIES

*** 49ER RIDGE ***	
TOTAL DEPTH: 14519.0	CASING ELEVATION: 3212.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
466.0	SALADO EVAPORITES
2213.0	CASTILE ANHYDRITE
3678.0	DELAWARE MT. GROUP
10405.0	WOLFCAMP SERIES
12618.0	STRAWN SERIES
12917.0	ATOKA SERIES
13515.0	MORROW SERIES

*** AA-2 ***	
TOTAL DEPTH: 5190.0	CASING ELEVATION: 3453.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
59.0	DEWEY LAKE
628.0	RUSTLER DOLOMITE AND ANHYDRITE
1047.0	SALADO EVAPORITES
3050.0	CASTILE ANHYDRITE
4425.0	DELAWARE MT. GROUP

*** AEC-7 ***	
TOTAL DEPTH: 3918.0	CASING ELEVATION: 3662.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
120.0	DEWEY LAKE
658.0	RUSTLER DOLOMITE AND ANHYDRITE
1053.0	SALADO EVAPORITES
2990.0	CASTILE ANHYDRITE

*** AEC-8 ***	
TOTAL DEPTH: 4910.0	CASING ELEVATION: 3542.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
227.0	DEWEY LAKE
710.0	RUSTLER DOLOMITE AND ANHYDRITE
1764.0	SALADO EVAPORITES
3020.0	CASTILE ANHYDRITE
4545.0	DELAWARE MT. GROUP

*** HAVERDORF-1 ***	
TOTAL DEPTH: 5591.0	CASING ELEVATION: 3482.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
60.0	DEWEY LAKE
658.0	RUSTLER DOLOMITE AND ANHYDRITE
1136.0	SALADO EVAPORITES
2930.0	CASTILE ANHYDRITE
4425.0	DELAWARE MT. GROUP

*** 8-1 ***	
TOTAL DEPTH: 15225.0	CASING ELEVATION: 3290.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
150.0	DEWEY LAKE
718.0	RUSTLER DOLOMITE AND ANHYDRITE
1064.0	SALADO EVAPORITES
2960.0	CASTILE ANHYDRITE
4246.0	DELAWARE MT. GROUP
11691.0	WOLFCAMP SERIES
12477.0	STRAWN SERIES
13246.0	ATOKA SERIES
13658.0	MORROW SERIES
15070.0	MISSISSIPPIAN LIMESTONE

*** CB-1 ***	
TOTAL DEPTH: 13950.0	CASING ELEVATION: 3320.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
359.0	RUSTLER DOLOMITE AND ANHYDRITE
598.0	SALADO EVAPORITES
2392.0	CASTILE ANHYDRITE
3857.0	DELAWARE MT. GROUP
10644.0	WOLFCAMP SERIES
12319.0	STRAWN SERIES
12618.0	ATOKA SERIES
13276.0	MORROW SERIES

*** COTTON BABY ***	
TOTAL DEPTH: 6700.0	CASING ELEVATION: 3450.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
59.0	DEWEY LAKE
658.0	RUSTLER DOLOMITE AND ANHYDRITE
957.0	SALADO EVAPORITES
2930.0	CASTILE ANHYDRITE
4336.0	DELAWARE MT. GROUP

*** C-1	***
TOTAL DEPTH: 13950.0	CASING ELEVATION: 3357.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
263.0	RUSTLER DOLOMITE AND ANHYDRITE
568.0	SALADO EVAPORITES
2177.0	CASTILE ANHYDRITE
3648.0	DELAWARE MT. GROUP
10585.0	WOLF CAMP SERIES
12020.0	STRAWN SERIES
12259.0	ATOKA SERIES
12917.0	MORROW SERIES

*** D-19	***
TOTAL DEPTH: 1369.0	CASING ELEVATION: 3149.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
419.0	SALADO EVAPORITES

*** D-96	***
TOTAL DEPTH: 1210.0	CASING ELEVATION: 3189.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
269.0	RUSTLER DOLOMITE AND ANHYDRITE
586.0	SALADO EVAPORITES

*** D-123	***
TOTAL DEPTH: 1880.0	CASING ELEVATION: 3432.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
59.0	DEWEY LAKE
658.0	RUSTLER DOLOMITE AND ANHYDRITE
957.0	SALADO EVAPORITES

*** EROA-6	***
TOTAL DEPTH: 2775.0	CASING ELEVATION: 3536.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
120.0	DEWEY LAKE
706.0	RUSTLER DOLOMITE AND ANHYDRITE
957.0	SALADO EVAPORITES
2631.0	CASTILE ANHYDRITE

*** EROA-9	***
TOTAL DEPTH: 2890.0	CASING ELEVATION: 3415.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
27.0	GATUNA
54.0	SANTA ROSA
63.0	DEWEY LAKE
550.0	RUSTLER DOLOMITE AND ANHYDRITE
860.0	SALADO EVAPORITES
2836.0	CASTILE ANHYDRITE

*** HUOSON FED ***	
TOTAL DEPTH: 14325.0	CASING ELEVATION: 3259.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
120.0	RUSTLER DOLOMITE AND ANHYDRITE
443.0	SALADO EVAPORITES
2452.0	CASTILE ANHYDRITE
3827.0	DELAWARE MT. GROUP
11033.0	WOLFCAMP SERIES
12678.0	STRAWN SERIES
12917.0	ATOKA SERIES
13503.0	MORROW SERIES

*** I-123 ***	
TOTAL DEPTH: 1880.0	CASING ELEVATION: 3170.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
120.0	RUSTLER DOLOMITE AND ANHYDRITE
478.0	SALADO EVAPORITES

*** I-376 ***	
TOTAL DEPTH: 1702.0	CASING ELEVATION: 3410.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
60.0	DEWEY LAKE
538.0	RUSTLER DOLOMITE AND ANHYDRITE
837.0	SALADO EVAPORITES

*** I-377 ***	
TOTAL DEPTH: 1876.0	CASING ELEVATION: 3490.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
179.0	DEWEY LAKE
718.0	RUSTLER DOLOMITE AND ANHYDRITE
1053.0	SALADO EVAPORITES

*** I-383 ***	
TOTAL DEPTH: 1307.0	CASING ELEVATION: 3272.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
120.0	RUSTLER DOLOMITE AND ANHYDRITE
478.0	SALADO EVAPORITES

*** I-443 ***	
TOTAL DEPTH: 1270.0	CASING ELEVATION: 3185.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
419.0	SALADO EVAPORITES

*** I-444 ***	
TOTAL DEPTH: 1240.0	CASING ELEVATION: 3130.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
407.0	SALADO EVAPORITES

*** I-457 ***	
TOTAL DEPTH: 1885.0	CASING ELEVATION: 3460.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
60.0	DEWEY LAKE
658.0	RUSTLER DOLOMITE AND ANHYDRITE
957.0	SALADO EVAPORITES

*** J-A ***	
TOTAL DEPTH: 14923.0	CASING ELEVATION: 3191.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
239.0	RUSTLER DOLOMITE AND ANHYDRITE
478.0	SALADO EVAPORITES
2260.0	CASTILE ANHYDRITE
3708.0	DELAWARE MT. GROUP
10525.0	WOLFCAMP SERIES
12080.0	STRAWN SERIES
12415.0	ATOKA SERIES
13066.0	MORROW SERIES
14232.0	MISSISSIPPIAN LIMESTONE

*** J-E ***	
TOTAL DEPTH: 13950.0	CASING ELEVATION: 3220.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
359.0	RUSTLER DOLOMITE AND ANHYDRITE
598.0	SALADO EVAPORITES
2369.0	CASTILE ANHYDRITE
3887.0	DELAWARE MT. GROUP
10585.0	WOLFCAMP SERIES
12199.0	STRAWN SERIES
12558.0	ATOKA SERIES
13216.0	MORROW SERIES

*** JR-3 ***	
TOTAL DEPTH: 15592.0	CASING ELEVATION: 3288.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
120.0	RUSTLER DOLOMITE AND ANHYDRITE
455.0	SALADO EVAPORITES
2452.0	CASTILE ANHYDRITE
3827.0	DELAWARE MT. GROUP
11039.0	WOLFCAMP SERIES
12678.0	STRAWN SERIES
12917.0	ATOKA SERIES
13485.0	MORROW SERIES
14771.0	MISSISSIPPIAN LIMESTONE
15488.0	SILURO-ORDOVICIAN UNDIFFERENTIATED

*** MONTGOMERY-1 ***	
TOTAL DEPTH: 3718.0	CASING ELEVATION: 3200.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
419.0	SALADO EVAPORITES
2153.0	CASTILE ANHYDRITE
3648.0	DELAWARE MT. GROUP

*** P-1	***
TOTAL DEPTH: 1591.0	CASING ELEVATION: 3445.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
359.0	RUSTLER DOLOMITE AND ANHYDRITE
694.0	SALADO EVAPORITES

*** P-4	***
TOTAL DEPTH: 1857.0	CASING ELEVATION: 3441.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
60.0	DEWEY LAKE
598.0	RUSTLER DOLOMITE AND ANHYDRITE
957.0	SALADO EVAPORITES

*** P-13	***
TOTAL DEPTH: 1576.0	CASING ELEVATION: 3345.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
419.0	RUSTLER DOLOMITE AND ANHYDRITE
718.0	SALADO EVAPORITES

*** P-15	***
TOTAL DEPTH: 1465.0	CASING ELEVATION: 3310.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
240.0	RUSTLER DOLOMITE AND ANHYDRITE
538.0	SALADO EVAPORITES

*** P-21	***
TOTAL DEPTH: 1915.0	CASING ELEVATION: 3510.0
START DEPTH	STRATA
-----	-----
0.0	SANTA ROSA
299.0	DEWEY LAKE
748.0	RUSTLER DOLOMITE AND ANHYDRITE
1076.0	SALADO EVAPORITES

*** W1	***
TOTAL DEPTH: 12457.0	CASING ELEVATION: 3198.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
331.0	SALADO EVAPORITES
827.0	CAPITAN REEF
3171.0	DELAWARE MT. GROUP
5569.0	LEONARD SERIES
9098.0	WOLF CAMP SERIES
10477.0	UPPER PENNSYLVANIAN
10752.0	STRAWN SERIES
10890.0	ATOKA SERIES
11304.0	MORROW SERIES
12269.0	BARNETT SHALE

*** W2	***
TOTAL DEPTH: 14059.0	CASING ELEVATION: 3220.0
START DEPTH	STRATA
-----	-----
0.0	RUSTLER DOLOMITE AND ANHYDRITE
303.0	SALADO EVAPORITES
1323.0	CASTILE ANHYDRITE
2840.0	DELAWARE MT. GROUP
6286.0	LEONARD SERIES
9181.0	WOLFCAMP SERIES
11083.0	STRAWN SERIES
11331.0	ATOKA SERIES
11828.0	MORROW SERIES
12544.0	BARNETT SHALE
12958.0	MISSISSIPPIAN LIMESTONE
13454.0	WOODFORD SHALE
13647.0	DEVONIAN LIMESTONE

*** W3	***
TOTAL DEPTH: 15605.0	CASING ELEVATION: 3433.0
START DEPTH	STRATA
-----	-----
0.0	TRIASSIC RED BEDS
248.0	DEWEY LAKE
358.0	RUSTLER DOLOMITE AND ANHYDRITE
579.0	SALADO EVAPORITES
1820.0	CASTILE ANHYDRITE
3281.0	DELAWARE MT. GROUP
6837.0	LEONARD SERIES
9677.0	WOLFCAMP SERIES
12048.0	STRAWN SERIES
12324.0	ATOKA SERIES
12710.0	MORROW SERIES
13454.0	BARNETT SHALE
13950.0	MISSISSIPPIAN LIMESTONE
14474.0	WOODFORD SHALE
14640.0	DEVONIAN LIMESTONE
14860.0	SILURIAN LIMESTONE
15219.0	MONTOYA DOLOMITE
15467.0	SIMPSON SHALE

*** W4	***
TOTAL DEPTH: 16459.0	CASING ELEVATION: 3515.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
110.0	TRIASSIC RED BEDS
551.0	DEWEY LAKE
689.0	RUSTLER DOLOMITE AND ANHYDRITE
1048.0	SALADO EVAPORITES
2288.0	TANSILL LIMESTONE
2481.0	CAPITAN REEF
3253.0	SAN ANDRES DOLOMITE
3860.0	DELAWARE MT. GROUP
7444.0	LEONARD SERIES
10201.0	WOLFCAMP SERIES
12269.0	STRAWN SERIES
12544.0	ATOKA SERIES
12710.0	MORROW SERIES
13289.0	BARNETT SHALE
13675.0	MISSISSIPPIAN LIMESTONE
14199.0	WOODFORD SHALE
14392.0	DEVONIAN LIMESTONE
14888.0	SILURIAN LIMESTONE
15329.0	MONTOYA DOLOMITE
15715.0	SIMPSON SHALE
15991.0	ELLENBURGER DOLOMITE
16404.0	PRECAMBRIAN

*** W5
TOTAL DEPTH: 16600.0
START DEPTH

0.0
221.0
965.0
1130.0
1600.0
2757.0
2895.0
3584.0
5045.0
7995.0
11028.0
11745.0
12021.0
12296.0
13206.0
13400.0
13923.0
14061.0
15164.0
15715.0
15991.0
16239.0
16542.0

CASING ELEVATION: 3603.0
STRATA

HOLOCENE SAND
TRIASSIC RED BEDS
DEWEY LAKE
RUSTLER DOLOMITE AND ANHYDRITE
SALADO EVAPORITES
TANSILL LIMESTONE
CAPITAN REEF
SAN ANDRES DOLOMITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
STRAWN SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE
SILURIAN LIMESTONE
MONTOKA DOLOMITE
SIMPSON SHALE
ELLENBURGER DOLOMITE
PRECAMBRIAN

*** W6
TOTAL DEPTH: 15650.0
START DEPTH

0.0
167.0
1338.0
1422.0
1924.0
3011.0
3095.0
4350.0
5688.0
7278.0
11293.0
12882.0
13217.0
13551.0
14555.0
14722.0
15308.0
15559.0

CASING ELEVATION: 3603.0
STRATA

TRIASSIC UNDIFFERENTIATED
TRIASSIC RED BEDS
DEWEY LAKE
RUSTLER DOLOMITE AND ANHYDRITE
SALADO EVAPORITES
CASTILE ANHYDRITE
CAPITAN REEF
SAN ANDRES DOLOMITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
STRAWN SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE

*** W7
TOTAL DEPTH: 15080.0
START DEPTH

0.0
276.0
1434.0
1709.0
2068.0
3364.0
3584.0
4466.0
5679.0
6617.0
10228.0
12241.0
12572.0
13234.0
13785.0
14033.0
14474.0
14750.0

CASING ELEVATION: 3752.0
STRATA

OGALLALA
TRIASSIC RED BEDS
DEWEY LAKE
RUSTLER DOLOMITE AND ANHYDRITE
SALADO EVAPORITES
TANSILL LIMESTONE
CAPITAN REEF
SAN ANDRES DOLOMITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
STRAWN SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE

*** WA
TOTAL DEPTH: 12725.0
START DEPTH

0.0
331.0
689.0
1544.0
1902.0
2206.0
3391.0
3584.0
1825.0
5928.0
6893.0
9787.0
10063.0
10339.0
10752.0
11166.0
11717.0
11855.0
12544.0
12682.0

CASING ELEVATION: 3653.0
STRATA

OGALLALA
CRETACEOUS
TRIASSIC RED BEDS
DEWEY LAKE
RUSTLER DOLOMITE AND ANHYORITE
SALADO EVAPORITES
TANSILL LIMESTONE
CAPITAN REEF
SAN ANDRES DOLOMITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
DETRITAL
STRAWN SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE

*** W9
TOTAL DEPTH: 9250.0
START DEPTH

0.0
248.0
1186.0
1378.0
1682.0
2702.0
2922.0
4108.0
5238.0
5514.0
7389.0
7499.0
7720.0
7995.0
8326.0
8960.0

CASING ELEVATION: 3523.0
STRATA

OGALLALA
TRIASSIC RED BEDS
DEWEY LAKE
RUSTLER DOLOMITE AND ANHYORITE
SALADO EVAPORITES
TANSILL LIMESTONE
CAPITAN REEF
SAN ANDRES DOLOMITE
GLORIETA SANDSTONE
LEONARD SERIES
DETRITAL
DEVONIAN LIMESTONE
SILURIAN LIMESTONE
MONTOKA DOLOMITE
SIMPSON SHALE
ELLENBURGER DOLOMITE

*** A10
TOTAL DEPTH: 13200.0
START DEPTH

0.0
85.0
569.0
1279.0
2758.0
4283.0
9240.0
11372.0
11543.0
12310.0
12936.0

CASING ELEVATION: 2928.0
STRATA

HOLOCENE SAND
SALADO SOLUTION BRECCIA
SALADO EVAPORITES
CASTILE ANHYORITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
STRAWN SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE

*** W11		***	
TOTAL DEPTH: 15095.0	CASING ELEVATION: 3020.0		
START DEPTH	STRATA		
-----	-----		
0.0	HOLOCENE SAND		
200.0	SALADO EVAPORITES		
1194.0	CASTILE ANHYDRITE		
3387.0	DELAWARE MT. GROUP		
6965.0	LEONARD SERIES		
9808.0	WOLFCAMP SERIES		
11997.0	STRAWN SERIES		
12253.0	ATOKA SERIES		
13021.0	MORROW SERIES		
13646.0	BARNETT SHALE		
14471.0	MISSISSIPPIAN LIMESTONE		
14727.0	WOODFORD SHALE		
14926.0	DEVONIAN LIMESTONE		

*** W12(JR-1)		***	
TOTAL DEPTH: 17554.0	CASING ELEVATION: 3308.0		
START DEPTH	STRATA		
-----	-----		
0.0	HOLOCENE SAND		
335.0	DEWEY LAKE		
502.0	RUSTLER DOLOMITE AND ANHYDRITE		
753.0	SALADO EVAPORITES		
2510.0	CASTILE ANHYDRITE		
3848.0	DELAWARE MT. GROUP		
7612.0	LEONARD SERIES		
10456.0	WOLFCAMP SERIES		
12715.0	STRAWN SERIES		
12862.0	ATOKA SERIES		
13551.0	MORROW SERIES		
14304.0	BARNETT SHALE		
14973.0	MISSISSIPPIAN LIMESTONE		
15392.0	WOODFORD SHALE		
15475.0	DEVONIAN LIMESTONE		
16061.0	SILURIAN LIMESTONE		
16730.0	MONTGOMERY DOLOMITE		
16981.0	SIMPSON SHALE		
17148.0	ELLENBURGER DOLOMITE		

*** W13		***	
TOTAL DEPTH: 16650.0	CASING ELEVATION: 3517.0		
START DEPTH	STRATA		
-----	-----		
0.0	HOLOCENE SAND		
284.0	TRIASSIC RED BEDS		
853.0	DEWEY LAKE		
995.0	RUSTLER DOLOMITE AND ANHYDRITE		
1279.0	SALADO EVAPORITES		
2701.0	CASTILE ANHYDRITE		
4577.0	DELAWARE MT. GROUP		
9098.0	LEONARD SERIES		
10292.0	WOLFCAMP SERIES		
13276.0	STRAWN SERIES		
13646.0	ATOKA SERIES		
14215.0	MORROW SERIES		
15096.0	BARNETT SHALE		
15722.0	MISSISSIPPIAN LIMESTONE		
16205.0	WOODFORD SHALE		
16347.0	DEVONIAN LIMESTONE		

*** W14		***
TOTAL DEPTH: 16300.0		CASING ELEVATION: 3773.0
START DEPTH		STRATA
-----		-----
0.0		OGALLALA
313.0		TRIASSIC RED BEDS
495.0		DEWEY LAKE
1279.0		RUSTLER DOLOMITE AND ANHYDRITE
1706.0		SALADO EVAPORITES
2985.0		CASTILE ANHYDRITE
4975.0		DELAWARE MT. GROUP
9126.0		LEONARD SERIES
10377.0		WOLFCAMP SERIES
13504.0		STRAWN SERIES
13789.0		ATOKA SERIES
14357.0		MORROW SERIES
15068.0		BARNETT SHALE
15637.0		MISSISSIPPIAN LIMESTONE
16148.0		WOODFORD SHALE
16205.0		DEVONIAN LIMESTONE

*** W15		***
TOTAL DEPTH: 16506.0		CASING ELEVATION: 3485.0
START DEPTH		STRATA
-----		-----
0.0		OGALLALA
398.0		TRIASSIC RED BEDS
995.0		DEWEY LAKE
1279.0		RUSTLER DOLOMITE AND ANHYDRITE
1564.0		SALADO EVAPORITES
2843.0		CASTILE ANHYDRITE
4975.0		DELAWARE MT. GROUP
8529.0		LEONARD SERIES
10604.0		WOLFCAMP SERIES
11798.0		STRAWN SERIES
12083.0		ATOKA SERIES
12651.0		MORROW SERIES
13362.0		BARNETT SHALE
14073.0		MISSISSIPPIAN LIMESTONE
14556.0		WOODFORD SHALE
14755.0		DEVONIAN LIMESTONE
15210.0		SILURIAN LIMESTONE
15494.0		MONTOKA DOLOMITE
15722.0		SILURIAN LIMESTONE
16205.0		MONTOKA DOLOMITE

*** W16	***
TOTAL DEPTH: 16000.0	CASING ELEVATION: 3405.0
START DEPTH	STRATA
-----	-----
0.0	OGALLALA
227.0	TRIASSIC RED BEDS
1279.0	DEWEY LAKE
1706.0	RUSTLER DOLOMITE AND ANHYDRITE
1819.0	SALADO EVAPORITES
3696.0	CASTILE ANHYDRITE
3866.0	TANSILL LIMESTONE
4065.0	CAPITAN REEF
5174.0	SAN ANDRES DOLOMITE
5686.0	DELAWARE MT. GROUP
9098.0	LEONARD SERIES
10860.0	WOLFCAMP SERIES
12367.0	UPPER PENNSYLVANIAN
12680.0	STRAWN SERIES
12936.0	ATOKA SERIES
13618.0	MORROW SERIES
14187.0	BARNETT SHALE
15153.0	MISSISSIPPIAN LIMESTONE
15608.0	WOODFORD SHALE
15864.0	DEVONIAN LIMESTONE

*** W17	***
TOTAL DEPTH: 12088.0	CASING ELEVATION: 3509.0
START DEPTH	STRATA
-----	-----
0.0	OGALLALA
370.0	TRIASSIC RED BEDS
1194.0	DEWEY LAKE
1478.0	RUSTLER DOLOMITE AND ANHYDRITE
1848.0	SALADO EVAPORITES
2900.0	CASTILE ANHYDRITE
3070.0	TANSILL LIMESTONE
3213.0	CAPITAN REEF
4265.0	SAN ANDRES DOLOMITE
5629.0	LEONARD SERIES
8671.0	WOLFCAMP SERIES
10775.0	STRAWN SERIES
11514.0	ATOKA SERIES
11941.0	MORROW SERIES

*** W18	***
TOTAL DEPTH: 10589.0	CASING ELEVATION: 3333.0
START DEPTH	STRATA
-----	-----
0.0	TRIASSIC RED BEDS
1109.0	DEWEY LAKE
1365.0	RUSTLER DOLOMITE AND ANHYDRITE
1621.0	SALADO EVAPORITES
2530.0	CASTILE ANHYDRITE
2701.0	TANSILL LIMESTONE
2900.0	CAPITAN REEF
4122.0	SAN ANDRES DOLOMITE
5686.0	LEONARD SERIES
7676.0	WOLFCAMP SERIES
7904.0	STRAWN SERIES
8529.0	ATOKA SERIES
8955.0	MORROW SERIES
9211.0	SILURIAN LIMESTONE
9524.0	MONTOKA DOLOMITE
9808.0	SIMPSON SHALE
10000.0	ELLENBURGER DOLOMITE

*** W19	***
TOTAL DEPTH: 14410.0	CASING ELEVATION: 2978.0
START DEPTH	STRATA
-----	-----
0.0	SALADO SOLUTION BRECCIA
732.0	SALADO EVAPORITES
1024.0	CASTILE ANHYDRITE
2487.0	DELAWARE MT. GROUP
6145.0	LEONARD SERIES
8837.0	WOLFCAMP SERIES
11704.0	UPPER PENNSYLVANIAN
11930.0	ATOKA SERIES
12874.0	MORROW SERIES
13313.0	BARNETT SHALE
13899.0	MISSISSIPPIAN LIMESTONE
14074.0	WOODFORD SHALE
14191.0	DEVONIAN LIMESTONE
0.0	SALADO SOLUTION BRECCIA

*** W20	***
TOTAL DEPTH: 15545.0	CASING ELEVATION: 3118.0
START DEPTH	STRATA
-----	-----
644.0	SALADO EVAPORITES
1990.0	CASTILE ANHYDRITE
3277.0	DELAWARE MT. GROUP
7022.0	LEONARD SERIES
9802.0	WOLFCAMP SERIES
12523.0	UPPER PENNSYLVANIAN
12728.0	ATOKA SERIES
13167.0	MORROW SERIES
14337.0	BARNETT SHALE
14923.0	MISSISSIPPIAN LIMESTONE
15215.0	WOODFORD SHALE
15362.0	DEVONIAN LIMESTONE

*** W21	***
TOTAL DEPTH: 16705.0	CASING ELEVATION: 3378.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
146.0	TRIASSIC RED BEDS
439.0	RUSTLER SOLUTION BRECCIA
761.0	SALADO SOLUTION BRECCIA
1317.0	SALADO EVAPORITES
2282.0	CASTILE ANHYDRITE
4038.0	DELAWARE MT. GROUP
7900.0	LEONARD SERIES
10680.0	WOLFCAMP SERIES
13606.0	UPPER PENNSYLVANIAN
13899.0	ATOKA SERIES
14337.0	MORROW SERIES
15069.0	BARNETT SHALE
16093.0	MISSISSIPPIAN LIMESTONE
16386.0	WOODFORD SHALE
16532.0	DEVONIAN LIMESTONE

*** W22	***
TOTAL DEPTH: 19546.0	CASING ELEVATION: 3475.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
146.0	TRIASSIC RED BEDS
849.0	RUSTLER DOLOMITE AND ANHYDRITE
1053.0	SALADO EVAPORITES
2341.0	CASTILE ANHYDRITE
4389.0	DELAWARE MT. GROUP
8632.0	LEONARD SERIES
10534.0	WOLFCAMP SERIES
13516.0	UPPER PENNSYLVANIAN
13811.0	ATOKA SERIES
14279.0	MONROW SERIES
14776.0	BARNETT SHALE
15713.0	MISSISSIPPIAN LIMESTONE
16005.0	WOODFORD SHALE
16152.0	DEVONIAN LIMESTONE
17000.0	SILURIAN LIMESTONE
17497.0	MUNTOVA DOLOMITE
17907.0	SIMPSON SHALE
18492.0	ELLENBURGER DOLOMITE
19078.0	PRECAMBRIAN

*** W23	***
TOTAL DEPTH: 16357.0	CASING ELEVATION: 3475.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
146.0	TRIASSIC RED BEDS
585.0	RUSTLER DOLOMITE AND ANHYDRITE
879.0	SALADO EVAPORITES
2780.0	CASTILE ANHYDRITE
4389.0	DELAWARE MT. GROUP
8632.0	LEONARD SERIES
10680.0	WOLFCAMP SERIES
13606.0	UPPER PENNSYLVANIAN
13899.0	ATOKA SERIES
14411.0	MONROW SERIES
14923.0	BARNETT SHALE
15947.0	MISSISSIPPIAN LIMESTONE
16166.0	WOODFORD SHALE
16350.0	DEVONIAN LIMESTONE

*** W24	***
TOTAL DEPTH: 17609.0	CASING ELEVATION: 3383.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
59.0	TRIASSIC RED BEDS
1024.0	RUSTLER DOLOMITE AND ANHYDRITE
1317.0	SALADO EVAPORITES
2780.0	CASTILE ANHYDRITE
4974.0	DELAWARE MT. GROUP
9510.0	LEONARD SERIES
11119.0	WOLFCAMP SERIES
14191.0	UPPER PENNSYLVANIAN
14484.0	ATOKA SERIES
14776.0	MONROW SERIES
15508.0	BARNETT SHALE
16825.0	MISSISSIPPIAN LIMESTONE
17117.0	WOODFORD SHALE
17263.0	DEVONIAN LIMESTONE

*** W25
TOTAL DEPTH: 20515.0
START DEPTH

0.0
879.0
1317.0
3219.0
5267.0
9948.0
11704.0
14045.0
14191.0
14484.0
15362.0
16532.0
16971.0
17117.0
17995.0
18726.0
19019.0
19239.0
19751.0

CASING ELEVATION: 3357.0
STRATA

TRIASSIC RED BEDS
RUSTLER DOLOMITE AND ANHYORITE
SALADO EVAPORITES
CASTILE ANHYORITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
UPPER PENNSYLVANIAN
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE
SILURIAN LIMESTONE
MONTOKA DOLOMITE
SIMPSON SHALE
ELLENBURGER DOLOMITE
PRECAMBRIAN

*** W26
TOTAL DEPTH: 20006.0
START DEPTH

0.0
848.0
1464.0
3219.0
5413.0
9948.0
11704.0
14484.0
14630.0
15142.0
16093.0
17629.0
17995.0
18288.0
19019.0

CASING ELEVATION: 3342.0
STRATA

TRIASSIC RED BEDS
RUSTLER DOLOMITE AND ANHYORITE
SALADO EVAPORITES
CASTILE ANHYORITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
UPPER PENNSYLVANIAN
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE
SILURIAN LIMESTONE

*** W27
TOTAL DEPTH: 19945.0
START DEPTH

0.0
1317.0
1756.0
2926.0
3365.0
5267.0
5998.0
8705.0
10534.0
11265.0
11558.0
11850.0
12289.0
13167.0
14411.0
15142.0
15215.0
16386.0
16825.0
17263.0
18141.0
18726.0

CASING ELEVATION: 3140.0
STRATA

TRIASSIC RED BEDS
RUSTLER DOLOMITE AND ANHYORITE
SALADO EVAPORITES
CASTILE ANHYORITE
CAPITAN REEF
SAN ANDRES DOLOMITE
DELAWARE MT. GROUP
LEONARD SERIES
WOLFCAMP SERIES
UPPER PENNSYLVANIAN
WOLFCAMP SERIES
ATOKA SERIES
MORROW SERIES
BARNETT SHALE
MISSISSIPPIAN LIMESTONE
WOODFORD SHALE
DEVONIAN LIMESTONE
SILURIAN LIMESTONE
MONTOKA DOLOMITE
SIMPSON SHALE
ELLENBURGER DOLOMITE
PRECAMBRIAN

*** W28	***
TOTAL DEPTH: 9437.0	CASING ELEVATION: 3179.0
START DEPTH	STRATA
-----	-----
0.0	TRIASSIC RED BEDS
878.0	RUSTLER DOLOMITE AND ANHYDRITE
1317.0	SALADO EVAPORITES
2341.0	CASTILE ANHYDRITE
2633.0	CAPITAN REEF
3950.0	SAN ANDRES DOLOMITE
5194.0	DELAWARE MT. GROUP
5267.0	LEONARD SERIES
6584.0	DETRITAL
6876.0	DEVONIAN LIMESTONE
7169.0	SILURIAN LIMESTONE
7608.0	MONTOYA DOLOMITE
7754.0	SIMPSON SHALE
7900.0	MONTOYA DOLOMITE
8193.0	SIMPSON SHALE
8779.0	ELLENBURGER DOLOMITE
9290.0	PRECAMBRIAN

*** W29	***
TOTAL DEPTH: 14572.0	CASING ELEVATION: 3042.0
START DEPTH	STRATA
-----	-----
0.0	SALADO SOLUTION BRECCIA
963.0	CASTILE ANHYDRITE
2408.0	DELAWARE MT. GROUP
7385.0	LEONARD SERIES
9151.0	WOLFCAMP SERIES
11681.0	STRAWN SERIES
12202.0	ATOKA SERIES
12523.0	MORROW SERIES
13165.0	BARNETT SHALE
14128.0	MISSISSIPPIAN LIMESTONE
14289.0	WOODFORD SHALE
14450.0	DEVONIAN LIMESTONE

*** W30	***
TOTAL DEPTH: 16326.0	CASING ELEVATION: 2971.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
642.0	RUSTLER DOLOMITE AND ANHYDRITE
963.0	SALADO EVAPORITES
2087.0	CASTILE ANHYDRITE
3372.0	DELAWARE MT. GROUP
8188.0	LEONARD SERIES
11239.0	WOLFCAMP SERIES
13326.0	STRAWN SERIES
13486.0	ATOKA SERIES
13807.0	MORROW SERIES
14450.0	BARNETT SHALE
16055.0	MISSISSIPPIAN LIMESTONE
16216.0	WOODFORD SHALE

*** W31	***
TOTAL DEPTH: 16976.0	CASING ELEVATION: 3224.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
1124.0	RUSTLER DOLOMITE AND ANHYDRITE
1284.0	SALADO EVAPORITES
2248.0	CASTILE ANHYDRITE
3853.0	DELAWARE MT. GROUP
4830.0	LEONARD SERIES
11720.0	WOLFCAMP SERIES
13807.0	STRAWN SERIES
14128.0	ATOKA SERIES
14450.0	MORROW SERIES
15092.0	BARNETT SHALE
16376.0	MISSISSIPPIAN LIMESTONE
16697.0	WOODFORD SHALE
16858.0	DEVONIAN LIMESTONE

*** W32	***
TOTAL DEPTH: 21290.0	CASING ELEVATION: 3382.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
642.0	TRIASSIC RED BEDS
903.0	DEWEY LAKE
963.0	RUSTLER DOLOMITE AND ANHYDRITE
1284.0	SALADO EVAPORITES
2569.0	CASTILE ANHYDRITE
4817.0	DELAWARE MT. GROUP
9312.0	LEONARD SERIES
11560.0	WOLFCAMP SERIES
14289.0	STRAWN SERIES
14610.0	ATOKA SERIES
14931.0	MORROW SERIES
16216.0	BARNETT SHALE
17018.0	MISSISSIPPIAN LIMESTONE
17339.0	WOODFORD SHALE
17500.0	DEVONIAN LIMESTONE
18303.0	SILURIAN LIMESTONE
18945.0	MONTOYA DOLOMITE
19266.0	SIMPSON SHALE
20229.0	ELLENBURGER DOLOMITE
21193.0	PRECAMBRIAN

*** W33		***	
TOTAL DEPTH: 22926.0	START DEPTH	CASING ELEVATION: 3178.0	STRATA
-----		-----	
0.0			HOLOCENE SAND
963.0			DEWEY LAKE
1124.0			RUSTLER DOLOMITE AND ANHYDRITE
1606.0			SALADO EVAPORITES
3211.0			CASTILE ANHYDRITE
5459.0			DELAWARE MT. GROUP
9312.0			LEONARD SERIES
12202.0			WOLFCAMP SERIES
14610.0			STRAWN SERIES
15252.0			ATOKA SERIES
15734.0			MORROW SERIES
16697.0			BARNETT SHALE
18463.0			MISSISSIPPIAN LIMESTONE
18945.0			WOODFORD SHALE
19016.0			DEVONIAN LIMESTONE
20069.0			SILURIAN LIMESTONE
20872.0			MONTOYA DOLOMITE
21193.0			SIMPSON SHALE
22317.0			ELLENBURGER DOLOMITE
22798.0			PRECAMBRIAN

*** W34		***	
TOTAL DEPTH: 21240.0	START DEPTH	CASING ELEVATION: 2981.0	STRATA
-----		-----	
0.0			HOLOCENE SAND
1124.0			TRIASSIC RED BEDS
1284.0			DEWEY LAKE
1766.0			RUSTLER DOLOMITE AND ANHYDRITE
2248.0			SALADO EVAPORITES
3211.0			CASTILE ANHYDRITE
3532.0			CAPITAN REEF
5298.0			DELAWARE MT. GROUP
8509.0			LEONARD SERIES
11560.0			WOLFCAMP SERIES
12684.0			STRAWN SERIES
13326.0			ATOKA SERIES
14128.0			MORROW SERIES
15092.0			BARNETT SHALE
16697.0			MISSISSIPPIAN LIMESTONE
17339.0			WOODFORD SHALE
17661.0			DEVONIAN LIMESTONE
18463.0			SILURIAN LIMESTONE
19266.0			MONTOYA DOLOMITE
19587.0			SIMPSON SHALE
20550.0			ELLENBURGER DOLOMITE
21193.0			PRECAMBRIAN

*** W35	***
TOTAL DEPTH: 12535.0	CASING ELEVATION: 3051.0
START DEPTH	STRATA
-----	-----
0.0	HOLOCENE SAND
642.0	DEWEY LAKE
963.0	RUSTLER DOLOMITE AND ANHYDRITE
1284.0	SALADO EVAPORITES
2569.0	CASTILE ANHYDRITE
2729.0	CAPITAN REEF
5459.0	LEONARD SERIES
5188.0	DETRITAL
8509.0	DETRITAL
8991.0	WOODFORD SHALE
9633.0	DEVONIAN LIMESTONE
10596.0	SILURIAN LIMESTONE
10917.0	MONTOYA DOLOMITE
11239.0	SIMPSON SHALE
12523.0	ELLENBURGER DOLOMITE

*** W36	***
TOTAL DEPTH: 14919.0	CASING ELEVATION: 3193.0
START DEPTH	STRATA
-----	-----
0.0	DEWEY LAKE
586.0	SALADO EVAPORITES
2008.0	CASTILE ANHYDRITE
3681.0	DELAWARE MT. GROUP
7529.0	LEONARD SERIES
10373.0	WOLFCAMP SERIES
12129.0	STRAWN SERIES
12380.0	ATOKA SERIES
12966.0	MORROW SERIES
14053.0	BARNETT SHALE
14221.0	MISSISSIPPIAN LIMESTONE
14722.0	WOODFORD SHALE
14806.0	DEVONIAN LIMESTONE

*** W37	***
TOTAL DEPTH: 14696.0	CASING ELEVATION: 3639.0
START DEPTH	STRATA
-----	-----
0.0	TRIASSIC RED BEDS
920.0	DEWEY LAKE
1004.0	RUSTLER DOLOMITE AND ANHYDRITE
1422.0	SALADO EVAPORITES
3011.0	CASTILE ANHYDRITE
4350.0	DELAWARE MT. GROUP
8449.0	LEONARD SERIES
11962.0	WOLFCAMP SERIES
12882.0	STRAWN SERIES
13049.0	ATOKA SERIES
13719.0	MORROW SERIES

TOTAL WELLS WITH DRILLERS LOGS = 69
 DEEPEST WELL = W33 AT 22926.0 FEET

WIPP Site Output Listing
of Strata Computer Codes Contained
in the Binary File Generated by WLGSMRY
and Used as Input to LOGSU.
(STRATBIN.LST

B-1 DEPTH= 15225.0 CASING= 3290.0 X= 83959. Y= 85126.

0.00	303
150.00	401
718.00	402
1064.00	403
2960.00	404
4246.00	410
11691.00	412
12977.00	501
13246.00	502
13658.00	503
15070.00	602

C8-1 DEPTH= 13950.0 CASING= 3320.0 X= 95729. Y= 84933.

0.00	401
359.00	402
598.00	403
2392.00	404
3857.00	410
10644.00	412
12319.00	501
12618.00	502
13276.00	503

COTTON BABY DEPTH= 6700.0 CASING= 3450.0 X= 0. Y= 0.

0.00	303
59.00	401
658.00	402
957.00	403
2930.00	404
4336.00	410

C-1 DEPTH= 13950.0 CASING= 3357.0 X= 83975. Y= 114764.

0.00	401
263.00	402
568.00	403
2177.00	404
3648.00	410
10585.00	412
12020.00	501
12259.00	502
12917.00	503

D-19 DEPTH= 1369.0 CASING= 3149.0 X= 74587. Y= 76300.

0.00	402
419.00	403

D-96 DEPTH= 1210.0 CASING= 3189.0 X= 75262. Y= 118239.

0.00	401
269.00	402
586.00	403

D-123 DEPTH= 1880.0 CASING= 3432.0 X= 107958. Y= 89623.

0.00	303
59.00	401
658.00	402
957.00	403

ERDA-6 DEPTH= 2775.0 CASING= 3536.0 X= 112551. Y= 121144.

0.00	303
120.00	401
706.00	402
957.00	403
2631.00	404

ERDA-9 DEPTH= 2890.0 CASING= 3415.0 X= 97443. Y= 97853.

0.00	102
27.00	302
54.00	303
63.00	401
550.00	402
860.00	403
2836.00	404

HUDSON FED DEPTH= 14325.0 CASING= 3259.0 X= 0. Y= 0.

0.00	401
120.00	402
443.00	403
2452.00	404
3827.00	410
11033.00	412
12678.00	501
12917.00	502
13503.00	503

I-123 DEPTH= 1800.0 CASING= 3170.0 X= 73589. Y= 122962.

0.00	401
120.00	402
478.00	403

I-376 DEPTH= 1702.0 CASING= 3410.0 X= 92640. Y= 102761.

0.00	303
60.00	401
538.00	402
837.00	403

I-377 DEPTH= 1876.0 CASING= 3490.0 X= 102946. Y= 102833.

0.00	303
179.00	401
718.00	402
1053.00	403

I-383 DEPTH= 1307.0 CASING= 3272.0 X= 82060. Y= 84225.

0.00	401
120.00	402
478.00	403

I-443 DEPTH= 1270.0 CASING= 3185.0 X= 78094. Y= 79036.

0.00	402
419.00	403

I-444 DEPTH= 1240.0 CASING= 3130.0 X= 76791. Y= 76155.

0.00	402
407.00	403

I-457 DEPTH= 1885.0 CASING= 3460.0 X= 104088. Y= 92495.

0.00	303
60.00	401
658.00	402
957.00	403

J-A DEPTH= 14923.0 CASING= 3191.0 X= 79064. Y= 113412.

0.00	401
239.00	402
478.00	403
2260.00	404
3708.00	410
10525.00	412
12080.00	501
12415.00	502
13066.00	503
14232.00	602

J-E DEPTH= 13950.0 CASING= 3220.0 X= 79969. Y= 111771.

0.00	401
359.00	402
598.00	403
2369.00	404
3887.00	410
10585.00	412
12199.00	501
12558.00	502
13216.00	503

JR-3 DEPTH= 15592.0 CASING= 3288.0 X= 85608. Y= 83919.

0.00	401
120.00	402
455.00	403
2452.00	404
3827.00	410
11039.00	412
12678.00	501
12917.00	502
13485.00	503
14771.00	602
15488.00	801

MONTGOMERY-1 DEPTH= 3718.0 CASING= 3200.0 X= 0. Y= 0.

0.00	402
419.00	403
2153.00	404
3648.00	410

P-1 DEPTH= 1591.0 CASING= 3445.0 X= 92881. Y= 92575.

0.00	401
359.00	402
694.00	403

P-4 DEPTH= 1857.0 CASING= 3441.0 X= 101457. Y= 92398.

0.00	303
60.00	401
598.00	402
957.00	403

P-13 DEPTH= 1576.0 CASING= 3345.0 X= 87024. Y= 108022.

0.00	401
419.00	402
718.00	403

P-15 DEPTH= 1465.0 CASING= 3310.0 X= 87274. Y= 87330.

0.00	401
240.00	402
538.00	403

P-21 DEPTH= 1915.0 CASING= 3510.0 X= 107982. Y= 107386.

0.00	303
299.00	401
748.00	402
1076.00	403

W1 DEPTH= 12457.0 CASING= 3190.0 X= -1590. Y= 127132.

0.00	402
331.00	403
827.00	407
3171.00	410
5569.00	411
9090.00	412
10477.00	501
10752.00	501
10890.00	502
11304.00	503
12269.00	601

W2 DEPTH= 14059.0 CASING= 3220.0 X= 21493. Y= 121008.

0.00	402
303.00	403
1323.00	404
2840.00	410
6206.00	411
9181.00	412
11003.00	501
11331.00	502
11828.00	503
12544.00	601
12958.00	602
13454.00	701
13647.00	702

W3 DEPTH= 15605.0 CASING= 3433.0 X= 40631. Y= 121833.

0.00	304
248.00	401
358.00	402
579.00	403
1820.00	404
3281.00	410
6837.00	411
9677.00	412
12048.00	501
12324.00	502
12710.00	503
13454.00	601
13950.00	602
14474.00	701
14642.00	702
14860.00	801
15219.00	901
15467.00	902

W4 DEPTH= 16459.0 CASING= 3515.0 X= 83322. Y= 160873.

0.00	102
110.00	304
551.00	401
689.00	402
1048.00	403
2288.00	405
2481.00	407
3253.00	408
3860.00	410
7444.00	411
10201.00	412
12269.00	501
12544.00	502
12710.00	503
13289.00	601
13675.00	602
14199.00	701
14392.00	702
14888.00	801
15329.00	901
15715.00	902
15991.00	903
16404.00	950

W5 DEPTH= 16600.0 CASING= 3603.0 X= 123776. Y= 155691.

0.00	102
221.00	304
965.00	401
1130.00	402
1600.00	403
2757.00	405
2895.00	407
3584.00	408
5045.00	410
7995.00	411
11028.00	412
11745.00	501
12021.00	502
12296.00	503
13206.00	601
13400.00	602
13923.00	701
14061.00	702
15164.00	801
15715.00	901
15991.00	902
16239.00	903
16542.00	950

W6 DEPTH= 15658.0 CASING= 3603.0 X= 144327. Y= 139910.

0.00	304
167.00	304
1338.00	401
1422.00	402
1924.00	403
3011.00	404
3095.00	407
4350.00	408
5688.00	410
7278.00	411
11293.00	412
12802.00	501
13217.00	502
13551.00	503
14555.00	601
14722.00	602
15306.00	701
15559.00	702

W7 DEPTH= 15080.0 CASING= 3752.0 X= 173533. Y= 154631.

0.00	101
276.00	304
1434.00	401
1709.00	402
2068.00	403
3364.00	405
3584.00	407
4466.00	408
5679.00	410
6617.00	411
10228.00	412
12241.00	501
12572.00	502
13234.00	503
13785.00	601
14033.00	602
14474.00	701
14750.00	702

W8 DEPTH= 12725.0 CASING= 3653.0 X= 222643. Y= 149626.

0.00	101
331.00	201
689.00	304
1544.00	401
1902.00	402
2206.00	403
3391.00	405
3584.00	407
1825.00	408
5928.00	410
6893.00	411
9787.00	412
10063.00	500
10339.00	501
10752.00	502
11166.00	503
11717.00	601
11855.00	602
12544.00	701
12682.00	702

W9 DEPTH= 9250.0 CASING= 3523.0 X= 281057, Y= 126426,

0.00	101
248.00	304
1186.00	401
1378.00	402
1682.00	403
2702.00	405
2922.00	407
4108.00	408
5238.00	409
5514.00	411
7389.00	500
7499.00	702
7720.00	801
7995.00	901
8326.00	902
8960.00	903

W10 DEPTH= 13200.0 CASING= 2928.0 X= 22258, Y= 73547,

0.00	102
85.00	403
569.00	403
1279.00	404
2758.00	410
6283.00	411
9240.00	412
11372.00	501
11543.00	502
12310.00	503
12936.00	601

W11 DEPTH= 15095.0 CASING= 3020.0 X= 53880, Y= 66540,

0.00	102
200.00	403
1194.00	404
3387.00	410
6965.00	411
9808.00	412
11997.00	501
12253.00	502
13021.00	503
13646.00	601
14471.00	602
14727.00	701
14926.00	702

W12(JR-1) DEPTH= 17554.0 CASING= 3308.0 X= 85222. Y= 87805.

0.00	102
335.00	401
502.00	402
753.00	403
2510.00	404
3848.00	410
7612.00	411
10456.00	412
12715.00	501
12882.00	502
13551.00	503
14304.00	601
14973.00	602
15392.00	701
15475.00	702
16061.00	801
16730.00	901
16981.00	902
17148.00	903

W13 DEPTH= 16650.0 CASING= 3517.0 X= 110762. Y= 70956.

0.00	102
284.00	304
853.00	401
995.00	402
1279.00	403
2701.00	404
4577.00	410
9098.00	411
10292.00	412
13276.00	501
13646.00	502
14215.00	503
15096.00	601
15722.00	602
16205.00	701
16347.00	702

W14 DEPTH= 16300.0 CASING= 3773.0 X= 147565. Y= 89387.

0.00	101
313.00	304
495.00	401
1279.00	402
1706.00	403
2985.00	404
4975.00	410
9126.00	411
10377.00	412
13504.00	501
13789.00	502
14357.00	503
15068.00	601
15637.00	602
16148.00	701
16205.00	702

W15 DEPTH= 16506.0 CASING= 3405.0 X= 186253. Y= 80142.

0.00	101
398.00	304
995.00	401
1279.00	402
1564.00	403
2043.00	404
4975.00	410
8529.00	411
10604.00	412
11798.00	501
12083.00	502
12651.00	503
13362.00	601
14073.00	602
14556.00	701
14755.00	702
15210.00	801
15494.00	901
15722.00	801
16205.00	901

W16 DEPTH= 16000.0 CASING= 3405.0 X= 226353. Y= 63654.

0.00	101
227.00	304
1279.00	401
1706.00	402
1819.00	403
3696.00	404
3866.00	405
4065.00	407
5174.00	408
5686.00	410
9098.00	411
10860.00	412
12367.00	501
12680.00	501
12936.00	502
13618.00	503
14187.00	601
15153.00	602
15608.00	701
15864.00	702

W17 DEPTH= 12088.0 CASING= 3509.0 X= 257974. Y= 80024.

0.00	101
370.00	304
1194.00	401
1478.00	402
1848.00	403
2900.00	404
3070.00	405
3213.00	407
4265.00	408
5629.00	411
8671.00	412
10775.00	501
11514.00	502
11941.00	503

W18 DEPTH= 10589.0 CASING= 3333.0 X= 286828. Y= 73547.

0.00	304
1109.00	401
1365.00	402
1621.00	403
2530.00	404
2701.00	405
2900.00	407
4122.00	408
5686.00	411
7676.00	412
7904.00	501
8529.00	502
8955.00	503
9211.00	801
9524.00	901
9808.00	902
10000.00	903

W19 DEPTH= 14410.0 CASING= 2978.0 X= 4593. Y= 707.

0.00	403
732.00	403
1024.00	404
2487.00	410
6145.00	411
8837.00	412
11704.00	501
11938.00	502
12674.00	503
13313.00	601
13899.00	602
14074.00	701
14191.00	702
0.00	403

W20 DEPTH= 15585.0 CASING= 3118.0 X= 41632. Y= 4063.

644.00	403
1990.00	404
3277.00	410
7022.00	411
9802.00	412
12523.00	501
12728.00	502
13167.00	503
14337.00	601
14923.00	602
15215.00	701
15362.00	702

W21 DEPTH= 16705.0 CASING= 3378.0 X= 83086. Y= 17548.

0.00	102
146.00	304
439.00	402
761.00	403
1317.00	403
2282.00	404
4038.00	410
7900.00	411
10680.00	412
13606.00	501
13899.00	502
14337.00	503
15069.00	601
16093.00	602
16386.00	701
16532.00	702

W22 DEPTH= 19546.0 CASING= 3475.0 X= 111999. Y= 20610.

0.00	102
146.00	304
849.00	402
1053.00	403
2341.00	404
4389.00	410
8632.00	411
10534.00	412
13518.00	501
13811.00	502
14279.00	503
14776.00	601
15713.00	602
16005.00	701
16152.00	702
17000.00	801
17497.00	901
17907.00	902
18492.00	903
19078.00	950

W23 DEPTH= 16357.0 CASING= 3475.0 X= 121420. Y= 12013.

0.00	102
146.00	304
585.00	402
879.00	403
2780.00	404
4389.00	410
8632.00	411
10680.00	412
13606.00	501
13899.00	502
14411.00	503
14923.00	601
15947.00	602
16166.00	701
16350.00	702

W24 DEPTH= 17609.0 CASING= 3383.0 X= 165584, Y= 3415.

0.00	102
59.00	304
1024.00	402
1317.00	403
2780.00	404
4974.00	410
9510.00	411
11119.00	412
14191.00	501
14484.00	502
14776.00	503
15508.00	601
16825.00	602
17117.00	701
17263.00	702

W25 DEPTH= 20515.0 CASING= 3357.0 X= 206568, Y= 7832.

0.00	304
879.00	402
1317.00	403
3219.00	404
5267.00	410
9948.00	411
11704.00	412
14045.00	501
14191.00	502
14484.00	503
15362.00	601
16532.00	602
16971.00	701
17117.00	702
17995.00	801
18726.00	901
19019.00	902
19239.00	903
19751.00	950

W26 DEPTH= 20006.0 CASING= 3342.0 X= 219758, Y= 6654.

0.00	304
848.00	402
1464.00	403
3219.00	404
5413.00	410
9948.00	411
11704.00	412
14484.00	501
14630.00	502
15142.00	503
16093.00	601
17629.00	602
17995.00	701
18288.00	702
19019.00	801

W27 DEPTH= 18945.0 CASING= 3140.0 X= 255287. Y= 10364.

0.00	304
1317.00	402
1756.00	403
2926.00	404
3365.00	407
5267.00	408
5998.00	410
8705.00	411
10534.00	412
11265.00	501
11558.00	412
11850.00	502
12289.00	503
13167.00	601
14411.00	602
15142.00	701
15215.00	702
16386.00	801
16825.00	901
17263.00	902
18141.00	903
18726.00	950

W28 DEPTH= 9437.0 CASING= 3179.0 X= 301961. Y= 23848.

0.00	304
878.00	402
1317.00	403
2341.00	404
2633.00	407
3950.00	408
5194.00	410
5267.00	411
6584.00	500
6876.00	702
7169.00	801
7608.00	901
7754.00	902
7900.00	901
8193.00	902
8779.00	903
9290.00	950

W29 DEPTH= 14572.0 CASING= 3042.0 X= 6183. Y= -20433.

0.00	403
963.00	404
2408.00	410
7385.00	411
9151.00	412
11881.00	501
12202.00	502
12523.00	503
13165.00	601
14128.00	602
14289.00	701
14450.00	702

W30 DEPTH= 16326.0 CASING= 2971.0 X= 73488, Y= -32446,

0.00	102
642.00	402
963.00	403
2087.00	404
3372.00	410
8188.00	411
11239.00	412
13326.00	501
13486.00	502
13807.00	503
14450.00	601
16055.00	602
16216.00	701

W31 DEPTH= 16976.0 CASING= 3224.0 X= 93980, Y= -28088,

0.00	102
1124.00	402
1284.00	403
2248.00	404
3853.00	410
8830.00	411
11720.00	412
13807.00	501
14128.00	502
14450.00	503
15092.00	601
16376.00	602
16697.00	701
16858.00	702

W32 DEPTH= 21290.0 CASING= 3382.0 X= 159224, Y= -7478,

0.00	102
642.00	304
803.00	401
963.00	402
1284.00	403
2569.00	404
4817.00	410
9312.00	411
11560.00	412
14289.00	501
14610.00	502
14931.00	503
16216.00	601
17018.00	602
17339.00	701
17500.00	702
18303.00	801
18945.00	901
19266.00	902
20229.00	903
21193.00	950

W33 DEPTH= 22926.0 CASING= 3178.0 X= 226059. Y= -25909.

0.00	102
963.00	401
1124.00	402
1606.00	403
3211.00	404
5459.00	410
9312.00	411
12202.00	412
14610.00	501
15252.00	502
15734.00	503
16697.00	601
18463.00	602
18945.00	701
19016.00	702
20069.00	801
20872.00	901
21193.00	902
22317.00	903
22798.00	950

W34 DEPTH= 21240.0 CASING= 2981.0 X= 252380. Y= -21846.

0.00	102
1124.00	304
1284.00	401
1766.00	402
2248.00	403
3211.00	404
3532.00	407
5298.00	410
8509.00	411
11560.00	412
12684.00	501
13326.00	502
14128.00	503
15092.00	601
16697.00	602
17339.00	701
17661.00	702
18463.00	801
19266.00	901
19587.00	902
20550.00	903
21193.00	950

W35 DEPTH= 12535.0 CASING= 3051.0 X= 305789. Y= -17960.

0.00	102
642.00	401
963.00	402
1284.00	403
2569.00	404
2729.00	407
5459.00	411
8188.00	500
8509.00	500
8991.00	701
9633.00	702
10596.00	801
10917.00	901
11239.00	902
12523.00	903

W36 DEPTH= 14919.0 CASING= 3193.0 X= 81084. Y= 111528.

0.00	401
586.00	403
2000.00	404
3681.00	410
7529.00	411
10373.00	412
12129.00	501
12380.00	502
12966.00	503
14053.00	601
14221.00	602
14722.00	701
14806.00	702

W37 DEPTH= 14696.0 CASING= 3639.0 X= 130960. Y= 130548.

0.00	304
920.00	401
1004.00	402
1422.00	403
3011.00	404
4350.00	410
8449.00	411
11962.00	412
12882.00	501
13049.00	502
13719.00	503

LOGSU

```

00001 C ***** [351,102]LOGSU,FLX *****
00002 C
00003 C UTILITY PROGRAM TO SETUP DISPLAY OF WELLS WITH DRILLERS
00004 C LOGS AND ALSO BUILD A FILE=Q FILE CONTAINING ALL OF
00005 C PARAMETERS FOR EACH WELL.
00006 C USED WITH CROSEC,FLX
00007 C (USES LOGSU,INP FOR INPUT OF FILE NAMES)
00008 C
00009 C DATA FILES:
00010 C NAME LUN TYPE ACCESS
00011 C
00012 C VS60--DISPLAY 1
00013 C DK1:(FILEQ)--WELLOGS 2 RAN W
00014 C DI:[351,102]LOGSU,INP 3 FOR R
00015 C DI:[I,J]STRATA,BIN 4 BIN R
00016 C DI:[K,L]PROJECT,MAP 6 DSP R
00017 C DI:[M,N]LOGS,DSP 7 DSP W
00018 C
00019 C
00020 C
00021 C BYTE WLDES, BINNAM(25), MAPNAM(25), DSPNAM(25)
00022 C INTEGER WELLS
00023 C
00024 C DIMENSION NBUF(106), LABEL(100)
00025 C
00026 C COMMON/DSP/ MAIN(100),WELLS(4000),MAP(2000)
00027 C COMMON/DTA/ WLDES(12),TD,CS,XXC,YYC,KSTRAT,ODD(30),NCODE(30),IM
00028 C
00029 C EQUIVALENCE (NBUF(1),WLDES(1))
00030 C
00031 C LPID = 100
00032 C NWELL = 0
00033 C NSTORE = 3
00034 C NODESX = 68
00035 C NODESY = 87
00036 C XINC = 2000.
00037 C YINC = 2000.
00038 C XYMAX = FLOAT(NODESY-1)*YINC
00039 C DSCALE = 900./XYMAX
00040 C RSCALE = XYMAX/900.
00041 C
00042 C
00043 C
00044 C CALL OPFILE (2,'WELLOGS',2500.,IPNT3)
00045 C ADR = 0.
00046 C
00047 C OPEN (UNIT=3,NAME='DI:LOGSU,INP',TYPE='OLD',READONLY)
00048 C READ(3,310) BINNAM
00049 C 310 FORMAT(25A1)
00050 C NCH = ICHR(BINNAM)
00051 C OPEN (UNIT=4,NAME=BINNAM,TYPE='OLD',
00052 C 1 FORM='UNFORMATTED',READONLY)
00053 C

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FLECS VERSION 22.46)      21-MAR-79   09108131   PAGE 00002
00054      CALL MAINOF (MAIN,100,1,1)
00055      CALL CLKOFF
00056      C
00057      CALL SUBOF (LABEL,100,0)
00058      CALL AREA (0)
00059      CALL INTENS (4)
00060      CALL CHRSC (3)
00061      CALL APOS (300,1000)
00062      CALL TEXT (' LOGSU PROGRAM')
00063      CALL ENDSB
00064      C
00065      C
00066      READ(3,310) MAPNAM
00067      NCH = ICHR(MAPNAM)
00068      CALL RESSOF (6,MAPNAM,MAP)
00069      CALL CALLSB (MAP)
00070      READ(3,310) DSPNAM
00071      CLOSE (UNIT=2)
00072      C
00073      CALL SUBOF (WELLS,4000)
00074      CALL LPHIT (1)
00075      10  READ (4,END=20) WLDES,YD,CS,XXC,YYC,KSTRAT
00076      DO (J=1,KSTRAT) READ(4) DDD(J),NCODE(J)
00077      NWELL = NWELL+1
00078      IX = XXC*USCALE
00079      IY = YYC*USCALE
00080      IF (XXC.NE.0. AND .YYC.NE.0.)
00081      .   LPID = LPID+1
00082      .   CALL NAME (LPID)
00083      .   CALL APNT (IX,IY)
00084      .   CALL DPW (IPNT3,ADR,NBUF,106.)
00085      .   ADR = ADR+1.
00086      .   NSTORE = NSTORE+1
00087      .   .FIN
00088      GO TO 10
00089      C
00090      20  CALL LPHIT (0)
00091      CALL ENDSB(ISZ)
00092      DO (J=1,12) WLDES(J)='9'
00093      CALL DPW (IPNT3,ADR,NBUF,106.)
00094      C
00095      WRITE(5,520) NSTORE,ISZ
00096      520  FORMAT(////////,' NO. OF WELLS =',I4,'   DISPLAY SIZE =',IS)
00097      NCH = ICHR(DSPNAM)
00098      CALL SAVSOF (7,DSPNAM,WELLS)
00099      STOP
00100      END

```

(FLECS VERSION 22.46)

Sample Input Command File
Used by LOGSU and CROSEC.

DI:(220,101)STRATA.BIN
DI:(351,101)WIPPMAP.MAP
DI:(351,102)LOGS.DSP

2OUTPUT BINARY FILE CREATED BY WLGSMRY
3MAP DISPLAY FILE (12 BY 12 @ 15,840 FT)
4WELL LOCATION DISPLAY FILE

WRITEFQ

FORTRAN IV=PLUS V02=518 09132147 23-MAR-79
 WRITFQ.FTN /TR:BLOCKS/WR

```

C ***** (351,102)WRITFQ.FTN *****
C
C PROGRAM TO PRINT THE ENTRIES IN THE FILE-Q
C DATA FILE GENERATED BY LOGSU. ENTRY IS SPECIFIED
C BY USER. (USED TO CHECK ENTRIES IN DATA FILE)
C
0001      BYTE WLDES
0002      DIMENSION NBUF(106)
0003      COMMON/DTA/ WLDES(12),TD,CS,XXC,YYC,KSTRAT,DDO(30),NCODE(30)
0004      EQUIVALENCE (NBUF(1),WLDES(1))
C
0005      CALL OPFILE (1,'WELLOGS',2500,,IPNT1)
0006      10  WRITE(5,510)
0007      510  FORMAT(//,'%S ENTER FILE-Q DISC ADDRESS(F10.0) > ')
0008      READ(5,511,END=99) ADR
0009      511  FORMAT(F10.0)
0010      CALL OPR(IPNT1,ADR,NBUF,106.)
0011      WRITE(5,512) WLDES,TD,CS,XXC,YYC,KSTRAT
0012      512  FORMAT(/,' WELL NO. = ',I2A1,' DEPTH=',F8.1,' CASING=',F8.1,/,
1 26X,'X=',F9.0,' Y=',F9.0,' STRATA=',I4)
0013      DO 20 J=1,KSTRAT
0014      WRITE(5,513) DDO(J),NCODE(J)
0015      513  FORMAT(1X,F9.1,5X,I5)
0016      20  CONTINUE
0017      GO TO 10
0  3      99  STOP
0019      END

```

PROGRAM SECTIONS

NAME	SIZE	ATTRIBUTES
SCODE1	000354 118	RW,I,CON,LCL
\$PDATA	000024 10	RW,D,CON,LCL
\$IDATA	000250 84	RW,D,CON,LCL
\$VARS	000010 4	RW,D,CON,LCL
DTA	000324 106	RW,D,QVR,GBL

TOTAL SPACE ALLOCATED = 001204 322

NO FPP INSTRUCTIONS GENERATED

DI:WRITFQ,DI:TEST,LST=DI:WRITFQ

Teletype Trailer Showing WRITFQ Program Operation
and Selected Data Retrieved
from the Random Access Disc.

^Z

>SET /UIC=[351,102]
>ASN DK2:=DI;
>RUN DI:LOGSU

NO. OF WELLS = 63 DISPLAY SIZE = 256
TTO -- STOP

HIT <CR> TO EXIT>

>RUN DI:WRITFQ

ENTER FILE-Q DISC ADDRESS(F10.0) > 0.

WELL NO. = AA-2	DEPTH= 5190.0	CASING= 3453.0	
	X= 112793.	Y= 86252.	STRATA= 6
0.0	303		
59.0	401		
628.0	402		
1047.0	403		
3050.0	404		
4425.0	410		

ENTER FILE-Q DISC ADDRESS(F10.0) > 5.

WELL NO. = C-1	DEPTH= 13950.0	CASING= 3357.0	
	X= 83975.	Y= 114764.	STRATA= 9
0.0	401		
263.0	402		
568.0	403		
2177.0	404		
3648.0	410		
10585.0	412		
12020.0	501		
12259.0	502		
12917.0	503		

ENTER FILE-Q DISC ADDRESS(F10.0) > 20.

WELL NO. = JR-3	DEPTH= 15592.0	CASING= 3288.0	
	X= 85608.	Y= 83919.	STRATA= 11
0.0	401		
120.0	402		
455.0	403		
2452.0	404		
3827.0	410		
11039.0	412		
12678.0	501		
12917.0	502		
13485.0	503		
14771.0	602		
15488.0	801		

ENTER FILE-Q DISC ADDRESS(F10.0) > ^Z

CROSEC


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-----
00001 C ***** [351,102]CROSEC,FLX *****
00002 C
00003 C PROGRAM TO DEFINE A REFERENCE LINE AND BOX AND
00004 C DISPLAY A CROSS SECTION OF THE CONTAINED WELLS,
00005 C ***** WIPP SITE --- 11/55 *****
00006 C
00007 C
00008 C DATA FILES:
00009 C NAME LUN TYPE ACCESS
00010 C
00011 C VS60--DISPLAY 1
00012 C SD=JOY STICK 2
00013 C OK1:(FILEQ)--WELLOGS 3 RAN R
00014 C OK1:(FILEQ)--TNOOE 3 RAN R/W
00015 C OI:[351,102]LOGSU,INP 4 FOR R
00016 C OI:[K,L]PROJECT,MAP 6 DSP R
00017 C OI:[M,N]LOGS,OSP 6 DSP R
00018 C
00019 C
00020 C NOTE: "LOGSU" MUST BE RUN FIRST THEN
00021 C INSTALL "CROSEC" AND "CROSC2".
00022 C (USES LOGSU,INP FOR INPUT OF DISPLAY FILE NAMES)
00023 C
00024 C
00025 C
00026 C BYTE WLOES, WLNAM(9), MAPNAM(25), OSPNAM(25)
00027 C INTEGER WELLS
00028 C REAL LISQ,L2SQ
00029 C LOGICAL LINMOD, NEWDSP
00030 C
00031 C DIMENSION MAP(2000), X(5), Y(5)
00032 C DIMENSION NBUF(100), NTRAN(382)
00033 C COMMON/DSP/ MAIN(100),LBUF(300),LINE(20),KBOX(100),NAMOSP(40),
00034 C 1 WELLS(2400),MESS1(30),MESS2(30),ISTAR(30)
00035 C COMMON/OTA/ WLOES(12),TD,CS,XXC,YYC,KSTRAT,ODO(30),NCODE(30),IM
00036 C COMMON/TNO/ IPROG,NWELL,CASHAX,NEWDSP,IOWELL(60),DALONG(60),
00037 C 1 OFROM(60),O,KDUM1(75)
00038 C
00039 C EQUIVALENCE (NBUF(1),WLOES(1)),(NTRAN(1),IPROG)
00040 C
00041 C
00042 C CALL OPFILE (3,'WELLOGS',2500.,IPNT3)
00043 C
00044 C CALL OPINQ (3,'TNOOE',ISTAT,SIZE)
00045 C CONDTIONAL
00046 C . (ISTAT.EQ.-1)
00047 C FILE DOESNT EXIST, SET UP NEW ONE
00048 C . . IPROG = 0
00049 C . . NWELL = 0
00050 C . . CALL OPFILE (3,'TNOOE',2.,IPNT4)
00051 C . . CALL OPW (IPNT4,0.,NTRAN,382.)
00052 C . ...FIN
00053 C FILE EXISTS AND IS NOT OPEN

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(FLECS VERSION 22,46)      21-MAR-79   09100112   PAGE   00002
00054      . (ISTAT,EQ,0)
00055      . . CALL DPFILE (3,'TNODE',2.,IPNT4)
00056      . . CALL DPR (IPNT4,0.,NTRAN,382.)
00057      . ...FIN
00058      ...FIN
00059      C
00060      I10 = 0
00061      I20 = 0
00062      INA = 0
00063      NODESX = 60
00064      NODESY = 87
00065      XINC = 2000.
00066      YINC = 2000.
00067      XYMAX = FLQAT(NODESY-1)*YINC
00068      DSCALE = 900./XYMAX
00069      RSCALE = XYMAX/900.
00070      ILN = 0
00071      IM2 = 0
00072      IBX = 0
00073      LINMOD = .FALSE.
00074      CALL MAINDF (MAIN,100,0,1)
00075      CALL CLKOFF
00076      C
00077      SETUP=INITIAL=DISPLAYS
00078      C
00079      OPEN (UNIT=4,NAME='DI:LOGSU.INP',TYPE='OLD',READONLY)
00080      READ (4,410)
00081      410  FORMAT(25A1)
00082      READ(4,410) MAPNAM
00083      NCM = ICHR(MAPNAM)
00084      CALL RESSDF (6,MAPNAM,MAP)
00085      CALL CALLSB (MAP)
00086      C
00087      READ (4,410) DSPNAM
00088      NCM = ICHR(DSPNAM)
00089      CLOSE (UNIT=4)
00090      CALL RESSDF (6,DSPNAM,WELLS)
00091      CALL CALLSB (WELLS)
00092      WHEN (IPROG,EQ,1)
00093      . CALL RESSDF (6,'OI:(200,200)DSP1,TMP',LINE)
00094      . CALL CALLSB (LINE)
00095      . CALL RESSDF (6,'OI:(200,200)DSP2,TMP',KBOX)
00096      . CALL CALLSB (KBOX)
00097      ...FIN
00098      ELSE
00099      . H = 0
00100      . NEWDSP = .TRUE.
00101      ...FIN
00102      C
00103      JOYXL = 10
00104      JOYYL = 100
00105      ITCX = JOYXL*4
00106      ITCY = JOYYL*4
00107      CALL TRAK (ITCX,ITCY)
00108      CALL SOINIT (2)
00109      CALL SOJOYF

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00110 C
00111 C
00112 C*****
00113 C
00114 C          START GRAPHIC CONTROL
00115 C
00116 C*****
00117 C
00118 C
00119 C
00120 10      CALL GRATN (0,ITYP,'LP')
00121          SELECT (ITYP)
00122 C *** LIGHT PEN INTERRUPT ***
00123          ('LP')
00124          . . . CALL LTPEN (ID,ITIP,LPX,LPY)
00125          . . . IF (ITIP.EQ.1)
00126          . . . . IF (ID.GE.1. AND .ID.LE.6)
00127          . . . . . CALL SUBOF (ISTAR,30,I10)
00128          . . . . . I10 = 2
00129          . . . . . IY = 590-(ID-1)*30
00130          . . . . . CALL AREA (1)
00131          . . . . . CALL CHRSC (0)
00132          . . . . . CALL INTENS (5)
00133          . . . . . CALL APOS (0,IY)
00134          . . . . . CALL TEXT('**')
00135          . . . . . CALL AREA (0)
00136          . . . . . CALL ENDSB
00137          . . . . . CALL WAIT (1,2,MMM)
00138          . . . . . ...FIN
00139 7 39          . . . . . CONDITIONAL
00140          . . . . . (ID.EQ.1)
00141          . . . . . . NWELL = 0
00142          . . . . . . LINMOD = .TRUE.
00143          . . . . . . NEWDSP = .TRUE.
00144          . . . . . . CALL STOPSB (KBOX,LINE)
00145          . . . . . . H = 0.0
00146          . . . . . . CALL TRKLOC (ITCX,ITCY)
00147          . . . . . . NX1 = ITCX
00148          . . . . . . NY1 = ITCY
00149          . . . . . . ...FIN
00150          . . . . . (ID.EQ.2)
00151          . . . . . . LINMOD = .FALSE.
00152          . . . . . . CALL TRKLOC (ITCX,ITCY)
00153          . . . . . . X1 = FLOAT(NX1)*RSCALE
00154          . . . . . . Y1 = FLOAT(NY1)*RSCALE
00155          . . . . . . X2 = FLOAT(ITCX)*RSCALE
00156          . . . . . . Y2 = FLOAT(ITCY)*RSCALE
00157          . . . . . . XX = X2-X1
00158          . . . . . . YY = Y2-Y1
00159          . . . . . . D = SQRT (XX*XX + YY*YY)
00160          . . . . . . WRITE(5,514) D,X1,Y1,X2,Y2
00161          . . . . . . 514      FORMAT(' LINE LENGTH = ',5F10.1)
00162          . . . . . . ...FIN
00163 C ** DELETE LINE
00164          . . . . . (ID.EQ.3)
00165          . . . . . . CALL STOPSB (LINE,KBOX)

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00166      ...FIN
00167 C ** DISPLAY CROSS SECTION
00168      (ID,EQ,4)
00169      IF (NEWDSP)
00170 C FIND HIGHEST CASING ELEVATION OF WELLS IN BOX
00171      NWELL = 0
00172      CASHMAX = 0.
00173      ADR = 0.
00174      CALL STRTSB (MESS1)
00175 15      CALL DPR (IPNT3,ADR,NBUF,106,)
00176      IF (WLOES(1),EQ,'9') GO TO 17
00177      CALL WITHIN (5,X,Y,XXC,YYC,IC)
00178      IF (IC,NE,0)
00179      IF (CS.GT,CASHMAX) CASHMAX = CS
00180      NWELL = NWELL+1
00181      IDWELL(NWELL) = IFIX(ADR)
00182 C ** CALCULATE DISTANCE FROM LINE & ALONG LINE.
00183      FX1 = X1-X2
00184      FY1 = Y1-Y2
00185      FX2 = X1-XXC
00186      FY2 = Y1-YYC
00187      FX3 = X2-XXC
00188      FY3 = Y2-YYC
00189      SMALLD = SQRT(FX1*FX1 + FY1*FY1)
00190      L1SQ = FX2*FX2 + FY2*FY2
00191      L2SQ = FX3*FX3 + FY3*FY3
00192      SD1 = SMALLD/2. + (L1SQ-L2SQ)/(2.*SMALLD)
00193      DALONG(NWELL) = SD1
00194      DFROM(NWELL) = SQRT(L1SQ-SD1**2.)
00195 95      C
00196 516      WRITE(5,516) WLOES,DALONG(NWELL)
00197      FORMAT(1X,12A1,' DISTANCE=',F9,0)
00198      ...FIN
00199      ADR = ADR+1.
00200      GO TO 15
00201 17      CONTINUE
00202      ICMAX = IFIX(CASHMAX)
00203      ICMAX = (ICMAX/10)*10 + 10
00204      CASHMAX = FLOAT(ICMAX)
00205 C ** SORT ACCORDING TO DISTANCE ALONG LINE.
00206      CONDITIONAL
00207      (NWELL,EQ,0)
00208      CALL SUBOF (MESS2,30,IM2)
00209      IM2 = 2
00210      CALL BLINK (1)
00211      CALL INTENS (3)
00212      CALL APOS (300,500)
00213      CALL TEXT ('NO WELLS WITHIN REGION')
00214      CALL BLINK (0)
00215      CALL ENDSB
00216      CALL WAIT (5,2,MMM)
00217      CALL STOPSB (MESS2)
00218      ...FIN
00219      (NWELL,EQ,1) CONTINUE
00220      (NWELL,GT,1)
00221      DO (J=1,NWELL+1)
00222      JJ = JJ+1

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00222      . . . . . DO (K=JJ,NWELL)
00223      . . . . . IF (DALONG(J).GT,DALONG(K))
00224      . . . . . DATMP = DALONG(J)
00225      . . . . . DFTMP = DFROM(J)
00226      . . . . . IDTMP = IDWELL(J)
00227      . . . . . DALONG(J) = DALONG(K)
00228      . . . . . DFROM(J) = DFROM(K)
00229      . . . . . IDWELL(J) = IDWELL(K)
00230      . . . . . DALONG(K) = DATMP
00231      . . . . . DFROM(K) = DFTMP
00232      . . . . . IDWELL(K) = IDTMP
00233      . . . . . FIN
00234      . . . . . FIN
00235      . . . . . FIN
00236      . . . . . FIN
00237      . . . . . FIN
00238      . . . . . IF (NWELL.NE.0)
00239      . . . . . K0UM1(1) = 0
00240      . . . . . CALL SAVSOF (6,'DI:(200,200)OSP1.TMP',LINE)
00241      . . . . . CALL SAVSOF (6,'DI:(200,200)OSP2.TMP',KBOX)
00242      . . . . . CALL DPW (IPNT4,0.,NTRAN,382.)
00243      . . . . . FIN
00244      . . . . . FIN
00245      C      . . . . .
00246      . . . . . IF (NWELL.NE.0)
00247      . . . . . TASK = RAD50 ('CROSC2')
00248      . . . . . CALL REQUES (TASK,,IDS)
00249      . . . . . IF (IDS.GT.0) CALL EXIT
00250      . . . . . WRITE(5,517)
00251      517      . . . . . FORMAT(////, ' *** CROSC2 MUST BE AN INSTALLED TA
00252      . . . . . FIN
00253      . . . . . CALL STOPSB (MESS1)
00254      . . . . . FIN
00255      C ** WRITE PLOT FILE
00256      . . . . . (ID.EQ.5)
00257      . . . . . CALL VOFIL (2,'DI:(200,200)CROSEC.DSP',MAIN,ICC,.7,
00258      C      . . . . . WRITE(5,518) ICC
00259      518      . . . . . FORMAT(' VOFIL, ICC=',I5)
00260      . . . . . FIN
00261      C ** RETURN TO CONTROL
00262      . . . . . (ID.EQ.6)
00263      . . . . . IF (ID.EQ.6) STOP
00264      . . . . . FIN
00265      C ** LP HIT ON INDIVIDUAL WELL
00266      . . . . . (ID.GE.101 .AND. ID.LE.2600)
00267      . . . . . ADR = ID-101
00268      . . . . . CALL UPR (IPNT3,ADR,WLOES,6.)
00269      . . . . . CALL SUBOF (NAMOSP,40,INA)
00270      . . . . . INA = 2
00271      . . . . . CALL INTENS (5)
00272      . . . . . CALL CHRSC (1)
00273      . . . . . CALL APOS (LPX,LPY)
00274      . . . . . CALL VEC (512,910)
00275      . . . . . CALL APOS (420,950)
00276      . . . . . CALL TEXT ('SELECTED WELL')
00277      . . . . . CALL APOS (405,910)

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(FLECS VERSION 22,46)      21-MAR-79      09100112 PAGE 00006
00278      . . . . . CALL BOX (210,60)
00279      . . . . . CALL APOS (434,925)
00280      . . . . . CALL TEXT (WLDES,0,12)
00281      . . . . . CALL ENDSB
00282      . . . . . ...FIN
00283 C ** CHECK FOR CHANGE IN BOX SIZE
00284      . . . . . (ID,GE,40, AND ,ID,LE,60)
00285      . . . . . FAC = ID*50
00286      . . . . . H = H+50.*FAC
00287      . . . . . IF (H,LT,0) H = 0.0
00288      . . . . . DX = (YY*H)/D
00289      . . . . . DY = (XX*H)/D
00290 C
00291      . . . . . X(1) = X1+DX
00292      . . . . . Y(1) = Y1+DY
00293      . . . . . X(2) = X1-DX
00294      . . . . . Y(2) = Y1-DY
00295      . . . . . X(3) = X2-DX
00296      . . . . . Y(3) = Y2-DY
00297      . . . . . X(4) = X2+DX
00298      . . . . . Y(4) = Y2+DY
00299      . . . . . X(5) = X(1)
00300      . . . . . Y(5) = Y(1)
00301      . . . . . CALL SUBOF (KBOX,100,IBX)
00302      . . . . . IBX = 2
00303      . . . . . CALL INTENS (3)
00304      . . . . . DO (J=1,5)
00305      . . . . . . IX = X(J)*OSCALE
00306      . . . . . . IY = Y(J)*OSCALE
00307      . . . . . . WHEN (J,EQ,1)
00308      . . . . . . . CALL APOS (IX,IY)
00309      . . . . . . ...FIN
00310      . . . . . . ELSE
00311      . . . . . . . CALL VEC (IX,IY)
00312      . . . . . . . ...FIN
00313      . . . . . . ...FIN
00314      . . . . . CALL AREA (1)
00315      . . . . . CALL INTENS (5)
00316      . . . . . CALL CHRSC (0)
00317      . . . . . CALL APOS (05,0)
00318      . . . . . HM = H*2,
00319      . . . . . CALL FNMBR (HM,'(F0,0)')
00320      . . . . . CALL AREA (0)
00321      . . . . . CALL ENDSB
00322      . . . . . CALL WAIT (200,1,MM)
00323      . . . . . ...FIN
00324      . . . . . ...FIN
00325      . . . . . IF (ID,GE,1, AND ,ID,LE,6) CALL STOPSB(ISTAR)
00326      . . . . . ...FIN
00327      . . . . . ...FIN
00328      . . . . . ...FIN
00329 C ** CHECK TRACKING CROSS FOR MOVEMENT
00330      . . . . . CALL SOJOYR (JOYX,JOYY)
00331      . . . . . IF (JOYX,NE,JOYXL, OR ,JOYY,NE,JOYYL)
00332      . . . . . . JOYXL = JOYX
00333      . . . . . . JOYYL = JOYY

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00334      . ITCX = JOYX*4
00335      . ITCY = (256-JOYX)*4
00336      . CALL TRKPOS (ITCX,ITCY,1)
00337      . IF (LINMOD)
00338 C   DRAW LINE
00339      . . CALL SUBOF (LINE,20,ILN)
00340      . . ILN = 2
00341      . . CALL APOS (NX1,NY1)
00342      . . CALL VEC (ITCX,ITCY)
00343      . . CALL ENOSS
00344      . ...FIN
00345      ..FIN
00346      GO TO 10

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```

00347      TO SETUP=INITIAL=DISPLAYS
00348 C
00349      . CALL SUBOF (LBUT,300,0)
00350      . CALL AREA (1)
00351      . CALL CHRSC (0)
00352      . CALL INTENS (4)
00353      . CALL APOS (0,700)
00354      . CALL TEXT (' LIGHT PEN OPTIONS')
00355      . CALL INTENS (7)
00356      . CALL APOS (0,605)
00357      . CALL BOX (150,40)
00358      . CALL APOS (5,690)
00359      . CALL BOX (140,30)
00360      . CALL MENU (590,30,1,' ANCHOR START OF LINE',
00361 1. ' ANCHOR END OF LINE', ' DELETE LINE', ' DISPLAY CROSS SECTION',
00362 2. ' WRITE PLOT FILE', ' STOP')
00363      . CALL AREA (1)
00364      . CALL LPHIT (1)
00365      . IX = 90
00366      . IY = 50
00367      . DO (J=1,10)
00368      . . ID = 50+J
00369      . . IX = IX+10
00370      . . CALL NAME (ID)
00371      . . CALL APOS (IX,IY)
00372      . . CALL TEXT ('>>>')
00373      . ...FIN
00374      . IX = 100
00375      . DO (J=1,10)
00376      . . ID = 50-J
00377      . . IX = IX-10
00378      . . CALL NAME (ID)
00379      . . CALL APOS (IX,IY)
00380      . . CALL TEXT ('<<<')
00381      . ...FIN
00382      . CALL LPHIT (0)
00383      . CALL APOS (20,30)
00384      . CALL TEXT ('SMALLER')
00385      . CALL APOS (120,30)
00386      . CALL TEXT ('LARGER')

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```
00387      . CALL APOS (20,0)
00388      . CALL TEXT ('BOX WIDTH =')
00389      . CALL APOS (160,0)
00390      . CALL TEXT ('FEET')
00391      . CALL AREA (0)
00392      . CALL ENDUS8(132)
00393      C      . WRITE(5,590) 132
00394      590    . FORMAT(' 132 = ',15)
00395      C      .
00396      . CALL SUBOF (MESS1,30,1)
00397      . CALL CHRSEL (1)
00398      . CALL BLINK (1)
00399      . CALL APOS (290,1000)
00400      . CALL TEXT (' CALCULATING CROSS-SECTIONAL AREA')
00401      . CALL BLINK (0)
00402      . CALL ENDUS8
00403      . . .FIN
00404      END
```

PROCEDURE CROSS-REFERENCE TABLE

00347 SETUP=INITIAL-DISPLAYS
00077

(FLECS VERSION 22,46)

CROSC2

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00001 C ***** [351,102]CROSC2.FLX *****
00002 C
00003 C PROGRAM CALLED BY CROSEC.FLX. THIS PROGRAM DISPLAYS
00004 C THE WELL STRATA CROSS-SECTION DEFINED BY CROSEC.
00005 C ***** WIPP SITE --- 11/55 *****
00006 C
00007 C
00008 C DATA FILES:
00009 C NAME LUN TYPE ACCESS
00010 C
00011 C VS60--DISPLAY 1
00012 C SO-JOY STICK 2
00013 C OK1:(FILEQ)--WELLOGS 3 RAN R
00014 C OK1:(FILEQ)--TNODE 3 RAN R
00015 C OI:[200,200]DSP3.TMP 6 RAN R/W
00016 C OI:[200,200]DSP4.TMP 6 RAN R/W
00017 C OI:[200,200]DSP5.TMP 6 RAN R/W
00018 C OI:[200,200]CROSC2.DSP 6 RAN R/W
00019 C
00020 C
00021 C BYTE WLDES,WLNAM(12),OLTNAM
00022 C INTEGER OLTOSP(200)
00023 C LOGICAL NEWOSP, NEWLIN, BUSY
00024 C
00025 C DIMENSION NBUF(106), NTRAN(382), LAYERS(30), LWELL(30)
00026 C DIMENSION IDWELL(60), OALONG(60), OFROM(60)
00027 C
00028 C COMMON/OSP/ MAIN(100),LBUT(250),LINDSP(1500),ISTAR(30),
00029 C LPNMBR(1300),LABELS(400),LAB2(120),LINADD(200)
00030 C COMMON/DTA/ WLDES(12),TD,CS,XXC,YYC,KSTRAT,ODD(30),NCODE(30),IM
00031 C COMMON/TNO/ IPROG,JWELL,CASMAX,NEWOSP,JOWELL(60), DA(60),
00032 C OF(60),D,NOLT,IDOLT(10),OLTNAM(12,10)
00033 C
00034 C EQUIVALENCE (NBUF(1),WLDES(1)),(NTRAN(1),IPROG)
00035 C
00036 C
00037 C CALL OFFILE (3,'WELLOGS',2500,,IPNT3)
00038 C CALL OFFILE (3,'TNODE',2,,IPNT4)
00039 C CALL UPR (IPNT4,0,,NTRAN,382,)
00040 C
00041 C CALL MAINOF (MAIN,100,0,1)
00042 C CALL CLKOFF
00043 C SETUP=INITIAL=DISPLAYS
00044 C IIO = 0
00045 C ILB = 0
00046 C ILP = 0
00047 C ILI = 0
00048 C IOL = 0
00049 C ILO = 0
00050 C IXOVR = 65
00051 C IYOVR = 85
00052 C
00053 C

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(FLECS VERSION 22.46)      21-MAR-79  08159121  PAGE 00002
00054      SETUP=ARRAYS=REMOVING=ANY=DELETED=WELLS
00055      WHEN (NEWDSP)
00056      .   SETUP=NEW=CROSS=SECTION=DISPLAY
00057      ...FIN
00058      ELSE
00059      .   CALL RESSDF (6,'DI1(200,200)DSP3,TMP',LINDSP)
00060      .   CALL RESSDF (6,'DI1(200,200)DSP4,TMP',LPNM8R)
00061      .   CALL RESSDF (6,'DI1(200,200)DSP5,TMP',LABELS)
00062      .   CALL CALLS8 (LINDSP)
00063      .   CALL CALLS8 (LPNM8R)
00064      .   CALL CALLS8 (LABELS)
00065      ...FIN
00066      C
00067      C
00068      JOYXL = 10
00069      JOYYL = 100
00070      CALL TRAK (950,1000)
00071      CALL SOINIT (2)
00072      CALL SOJOYF
00073      BUSY = .FALSE.
00074      C
00075      C
00076      10   CALL GRATN (0,ITYP,'LP')
00077      CALL SOJOYR (JOYX,JOYY)
00078      IF (JOYX.NE.JOYXL. OR .JOYY.NE.JOYYL)
00079      .   JOYXL = JOYX
00080      .   JOYYL = JOYY
00081      .   ITCX = JOYX*4
00082      .   ITCY = (256-JOYY)*4
00083      .   CALL TRKPOS (ITCX,ITCY,1)
00084      ...FIN
00085      SELECT (ITYP)
00086      C *** LIGHT PEN INTERRUPT ***
00087      .   ('LP')
00088      .   .   CALL LTPEN (ID,ITIP)
00089      .   .   IF (ITIP.EQ.1)
00090      .   .   .   IF (.NOT.BUSY)
00091      .   .   .   .   BUSY = .TRUE.
00092      .   .   .   .   CALL WAIT (1,2,MMM)
00093      .   .   .   .   IF (ID.GE.1.AND.ID.LE.9)
00094      .   .   .   .   .   IY1 = 850
00095      .   .   .   .   .   IF (ID.GT.6) IY1 = 780
00096      .   .   .   .   .   DISPLAY=STAR
00097      .   .   .   .   .   ...FIN
00098      .   .   .   .   .   CONDITIONAL
00099      C   ** DISPLAY MAP
00100      .   .   .   .   .   (ID.EQ.1)
00101      .   .   .   .   .   .   CALL SAVSDF (6,'DI1(200,200)DSP4,TMP',LPNM8R)
00102      .   .   .   .   .   .   CALL SAVSDF (6,'DI1(200,200)DSP5,TMP',LABELS)
00103      .   .   .   .   .   .   TASK = RAD50 ('CROSEC')
00104      .   .   .   .   .   .   CALL REQUES (TASK,,IDS)
00105      .   .   .   .   .   .   IF (IDS.GT.0) CALL EXIT
00106      .   .   .   .   .   .   ...FIN
00107      C   ** REMOVE STRATA CODES
00108      .   .   .   .   .   (ID.EQ.2)
00109      .   .   .   .   .   .   CALL STOPS8 (LPNM8R)

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00110      . . . . .FIN
00111 C    ** DISPLAY STRATA CODES
00112      . . . . . (ID,EQ,3)
00113      . . . . . CALL STRTSB (LPNMBR)
00114      . . . . .FIN
00115 C    ** REMOVE STRATA LABELS
00116      . . . . . (ID,EQ,4)
00117      . . . . . CALL SUBDF (LABELS,500,ILB)
00118      . . . . . ILB = 2
00119      . . . . . CALL CHRSC (0)
00120      . . . . . CALL INTENS (4)
00121      . . . . . CALL ENDSB
00122      . . . . .FIN
00123 C    ** WRITE PLOT FILE
00124      . . . . . (ID,EQ,5)
00125      . . . . . CALL VDFILE (6,'01:[200,200]CROSC2,DSP',MAIN,ICC,
00126      . . . . .FIN
00127      . . . . . (ID,EQ,6)
00128      . . . . . IF (ID,EQ,6) STOP
00129      . . . . .FIN
00130 C    ** SET START OF LINE
00131      . . . . . (ID,EQ,7)
00132      . . . . . CALL TRKLOC (NX1,NY1)
00133      . . . . . CALL OPENS (LINA00,200)
00134      . . . . . CALL LINTYP (3)
00135      . . . . . CALL APOS (NX1,NY1)
00136      . . . . . CALL ENDSB
00137      . . . . .FIN
00138 C    ** SET END OF LINE
00139      . . . . . (ID,EQ,8)
00140      . . . . . CALL TRKLOC (NX2,NY2)
00141      . . . . . CALL OPENS (LINA00,200)
00142      . . . . . CALL LINTYP (3)
00143      . . . . . CALL AVEC (NX2,NY2)
00144      . . . . . CALL ENDSB
00145      . . . . .FIN
00146 C    ** DELETE LINE
00147      . . . . . (ID,EQ,9)
00148      . . . . . CALL SUBDF (LINA00,200,ILI)
00149      . . . . . ILI = 2
00150      . . . . . CALL LINTYP (2)
00151      . . . . . CALL ENDSB
00152      . . . . .FIN
00153 C    ** DISPLAY STRATA LABEL
00154      . . . . . (ID,GE,100,AND,ID,LT,1000)
00155      . . . . . CALL TRKLOC (IX,IY)
00156      . . . . . CALL OPENS (LABELS,500)
00157      . . . . . CALL CHRSC (0)
00158      . . . . . CALL INTENS (4)
00159      . . . . . CALL APOS (IX,IY)
00160      . . . . . SELECT (ID)
00161      . . . . . (101) CALL TEXT ('OGALLA',0)
00162      . . . . . (102) CALL TEXT ('HOLOCENE',0)
00163      . . . . . (201) CALL TEXT ('CRETACEOUS',0)
00164      . . . . . (302) CALL TEXT ('GATUNA',0)
00165      . . . . . (303) CALL TEXT ('SANTA ROSA',0)

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(FLECS VERSION 22,46)      21-MAR-79      00159121      PAGE      000004
00166      . . . . . (304) CALL TEXT ('TRIASSIC',0)
00167      . . . . . (401) CALL TEXT ('DEWY LAKE',0)
00168      . . . . . (402) CALL TEXT ('RUSTLER',0)
00169      . . . . . (403) CALL TEXT ('SALADO',0)
00170      . . . . . (404) CALL TEXT ('CASTILE ANHYDRITE',0)
00171      . . . . . (405) CALL TEXT ('TANSILL LIMESTONE',0)
00172      . . . . . (406) CALL TEXT ('YATES SANDSTONE',0)
00173      . . . . . (407) CALL TEXT ('CAPITAN REEF',0)
00174      . . . . . (408) CALL TEXT ('SAN ANDRES DOLOMITE',0)
00175      . . . . . (409) CALL TEXT ('GLORIETA SANDSTONE',0)
00176      . . . . . (410) CALL TEXT ('DELAWARE MT. GROUP',0)
00177      . . . . . (411) CALL TEXT ('LEONARD SERIES',0)
00178      . . . . . (412) CALL TEXT ('WOLFCAMP SERIES',0)
00179      . . . . . (413) CALL TEXT ('PERMIAN',0)
00180      . . . . . (500) CALL TEXT ('DETRITAL',0)
00181      . . . . . (501) CALL TEXT ('STRAWN SERIES',0)
00182      . . . . . (502) CALL TEXT ('ATOKA SERIES',0)
00183      . . . . . (503) CALL TEXT ('MORROW SERIES',0)
00184      . . . . . (504) CALL TEXT ('PENNSYLVANIAN',0)
00185      . . . . . (601) CALL TEXT ('VARNETT SHALE',0)
00186      . . . . . (602) CALL TEXT ('MISSISSIPPIAN',0)
00187      . . . . . (701) CALL TEXT ('WOORFORD',0)
00188      . . . . . (702) CALL TEXT ('DEVONIAN',0)
00189      . . . . . (801) CALL TEXT ('SILURIAN',0)
00190      . . . . . (901) CALL TEXT ('MONTJOYA DOLOMITE',0)
00191      . . . . . (902) CALL TEXT ('SIMPSON SHALE',0)
00192      . . . . . (903) CALL TEXT ('ELLENBURGER DOLOMITE',0)
00193      . . . . . (904) CALL TEXT ('ORDOVICIAN',0)
00194      . . . . . (950) CALL TEXT ('PRECAMBRIAN',0)
00195      . . . . . ...FIN
00196      . . . . . CALL ENDSB
00197      . . . . . CALL WAIT(1,2,MMM)
00198      . . . . . ...FIN
00199      C  ** DELETE WELL & RECALCULATE STRATA
00200      . . . . . (ID.GT.1000. AND .ID.LT.1100)
00201      . . . . . ID = ID-1000
00202      . . . . . ADN = IDWELL(ID)
00203      . . . . . CALL DPR (IPNT3,ADR,NBUF,6,)
00204      . . . . . NDLT = NDLT+1
00205      . . . . . DO (K=1,12) DLTNAM(K,NDLT)=WLDES(K)
00206      . . . . . IDOLT(NDLT) = IDWELL(ID)
00207      . . . . . CALL STOPSB (LPNMBR)
00208      . . . . . DISPLAY=DELETED=WELL-NAMES
00209      . . . . . SETUP=ARRAYS-REMOVING=ANY-DELETED=WELLS
00210      . . . . . SETUP=NEW-CROSS-SECTION-DISPLAY
00211      . . . . . CALL WAIT(1,2,MMM)
00212      . . . . . ...FIN
00213      C  ** INSERT WELL & RECALCULATE STRATA
00214      . . . . . (ID.GT.1100. AND.ID.LT.1200)
00215      . . . . . ID = ID+1100
00216      . . . . . IF (ID.NE.NDLT)
00217      . . . . . JB = ID+1
00218      . . . . . DO (J=JB,NDLT)
00219      . . . . . IDOLT(ID) = IDOLT(J)
00220      . . . . . DO (K=1,12) DLTNAM(K,ID) = DLTNAM(K,J)
00221      . . . . . ID = ID+1

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00222      . . . . . FIN
00223      . . . . . FIN
00224      . . . . . NDLT = NDLT+1
00225      . . . . . CALL STOP98 (LPNM8R)
00226      . . . . . DISPLAY=DELETED=WELL=NAME
00227      . . . . . SETUP=ARRAYS=REMOVING=ANY=DELETED=WELLS
00228      . . . . . SETUP=NEW=CROSS=SECTION=DISPLAY
00229      . . . . . CALL WAIT (1,2,MM)
00230      . . . . . FIN
00231      . . . . . FIN
00232      . . . . . IF (ID.LE.9) CALL STOP98 (ISTAR)
00233      . . . . . BUSY = .FALSE.
00234      . . . . . FIN
00235      . . . . . FIN
00236      . . . . . FIN
00237      . . . . . FIN
00238      GO TO 10
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00239      TO SETUP=ARRAYS=REMOVING=ANY=DELETED=WELLS
00240      . NWELL = 0
00241      . DO (K=1,JWELL)
00242      . . IF (NDLT.NE.0)
00243      . . . DO (J=1,NDLT)
00244      . . . . IF (JWELL(K).EQ.IDDLT(J)) GO TO 15
00245      . . . . FIN
00246      . . . FIN
00247      . . NWELL = NWELL+1
00248      . . IDWELL(NWELL) = JWELL(K)
00249      . . DALONG(NWELL) = DA(K)
00250      . . OFROM(NWELL) = OF(K)
00251 15      . CONTINUE
00252      . . . FIN
00253      . . . FIN
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00254      TO DISPLAY=DELETED=WELL=NAME
00255      . CALL SUBOF (DLTOSP,200,IDL)
00256      . IDL = 2
00257      . CALL AREA (1)
00258      . CALL CHRSC (0)
00259      . CALL INTENS (5)
00260      . IF (NDLT.NE.0)
00261      . . CALL APOS (40,540)
00262      . . CALL TEXT ('DELETED WELLS',-3)
00263      . . CALL RVEC (90,0)
00264      . . CALL LPHIT(1)
00265      . . DO (J=1,NDLT)
00266      . . . IY = 470+(J-1)*20
00267      . . . IDO = 1100+J
00268      . . . CALL NAME(IDO)
00269      . . . CALL APOS (40,IY)
00270      . . . DO (K=1,12) NLNAM(K)=DLTNAM(K,J)
00271      . . . CALL TEXT (NLNAM,0,12)
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00272      . . . . .FIN
00273      . . . CALL LPHIT (0)
00274      . . . . .FIN
00275      . . . CALL ENDSB
00276      . . . . .FIN

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00277      TO SETUP=NEW=CROSS=SECTION=DISPLAY
00278      . RANGE = 0,
00279      . DO (J=1,NWELL)
00280      . . . ADR = IDWELL(J)
00281      . . . CALL DPR (IPNT3,ADR,NBUF,10,)
00282      . . . TEST = CSMAX-CS+TD
00283      . . . IF (TEST,GT,RANGE) RANGE=TEST
00284      . . . . .FIN
00285      . NRANGE = RANGE
00286      . YDIF = 700,
00287      . IF (RANGE,GT,YDIF) YDIF=((NRANGE+100)/100)*100
00288      . YBOT = CSMAX-YDIF
00289      . OSYFAC = 850,/(CSMAX-YBOT)
00290      . DSXFAC = 950,/D
00291      . CALL SUBOF (LINOSP,1500,ILD)
00292      . ILD = 2
00293      . CALL CHRSC (0)
00294      . CALL INTENS (5)
00295      . DISPLAY=SCALE
00296      . CALL CHRTYP (0,1,0)
00297      . DO (J=1,NWELL)
00298      . . . ADR = IDWELL(J)
00299      . . . CALL DPR (IPNT3,ADR,NBUF,100,)
00300      . . . IX = DALONG(J)*DSXFAC + IXOVR
00301      . . . IYT = (CS-YBOT)*OSYFAC + IYOVR
00302      . . . IYB = (CS-YBOT-TD)*OSYFAC + IYOVR
00303      . . . ID = 1000+J
00304      . . . WHEN (J,EQ,1) CALL APOS (IX,IYT)
00305      . . . ELSE
00306      . . . . . CALL VEC (IX,IYT)
00307      . . . . .FIN
00308      . . . CALL VEC (IX,IYB)
00309      . . . CALL INTENS(5)
00310      . . . IY = IYB+(IYT-IYB)/2-40
00311      . . . CALL LPHIT (1)
00312      . . . CALL NAME (ID)
00313      . . . CALL APOS (IX-2,IY)
00314      . . . CALL TEXT (WLDES,0,12)
00315      . . . CALL LPHIT (0)
00316      . . . CALL INTENS (5)
00317      . . . CALL APOS (IX,IYT)
00318      . . . . .FIN
00319      . CALL CHRTYP (0,0,0)
00320      . DISPLAY=STRATOGRAPHIC=LAYERS
00321      . CALL ENDSB
00322      . DISPLAY=LAYER=NUMBERS
00323      . NEWOSP = ,FALSE,
00324      . IPRG = 1

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00325      . CALL SAVSDF (6,'OI:[200,200]OSP3,TMP',LINDSP)
00326      . CALL OPW (IPNT4,0.,NTRAN,382.)
00327      . CALL SUBDF (LABELS,500,ILB)
00328      . ILB = 2
00329      . CALL CHRSCAL (0)
00330      . CALL INTENS (4)
00331      . CALL ENDSB
00332      . CALL SUBDF (LINADD,200,ILT)
00333      . ILI = 2
00334      . CALL LINTYP (2)
00335      . CALL ENDSB
00336      ...FIN

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00337      TO DISPLAY=STAR
00338      . CALL SUBDF (ISTAR,30,I10)
00339      . I10 = 2
00340      . IY = IY1+(ID-1)*30
00341      . CALL AREA (1)
00342      . CALL CHRSCAL (0)
00343      . CALL INTENS (5)
00344      . CALL APOS (0,IY)
00345      . CALL TEXT('**')
00346      . CALL AREA (0)
00347      . CALL ENDSB
00348      . CALL WAIT (1,2,MMM)
00349      ...FIN

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00350      TO DISPLAY=SCALE
00351      C
00352      C Y LABEL, ORIGINATE & Y VALUES
00353      . IYT = (CASMAY-YBOT)*DSYFAC
00354      . CALL APOS (IXOVR,IYOVR)
00355      . CALL VEC (IXOVR,IYT+IYOVR)
00356      . CALL CHRTYP (1,0,0)
00357      . YY = YBOT+10.
00358      . YINC = 50.
00359      . IF (RANGE. GT . 1000.) YINC = 100.
00360      . IF (RANGE. GT . 2000.) YINC = 200.
00361      . IF (RANGE. GT . 5000.) YINC = 500.
00362      . IF (RANGE. GT . 10000.) YINC = 1000.
00363      . DO (YZ=YY,CASMAY,YINC)
00364      . . YYY = (YZ-YBOT)*DSYFAC + IYOVR
00365      . . IF (YYY.GT.1023.) WRITE(5,530) YYY
00366      530      . . FORMAT(' IY =',F12.0)
00367      . . IY = YYY
00368      . . CALL APOS (IXOVR,IY)
00369      . . CALL RVEC (-7,0)
00370      . . IF (YZ.GT.25000.) WRITE(5,531) YZ
00371      531      . . FORMAT(' YZ =',F12.0)
00372      . . NY = IFIX(YZ)
00373      . . WHEN (NY.GT.-9999. AND .NY.LT.9999)
00374      . . . CALL APOS (15,IY)

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00375      . . . CALL INMBR (NY, '(I5)')
00376      . . . . .FIN
00377      . . . ELSE
00378      . . . . .CALL APOS (8,IY)
00379      . . . . .CALL INMBR (NY, '(I6)')
00380      . . . . .FIN
00381      . . . . .FIN
00382      . . . CALL CHRTYP (1,1,0)
00383      . . . IY = IYOVR + IYT/2 -63
00384      . . . CALL APOS (8,IY)
00385      . . . CALL TEXT ('ELEVATION (FT-MSL)')
00386  C
00387  C X LABEL, ABCISSA & X VALUES
00388      . . . XINC = 100.
00389      . . . IF (D.GT.2000.) XINC=200.
00390      . . . IF (D.GT.5000.) XINC=500.
00391      . . . IF (D.GT.10000.) XINC=1000.
00392      . . . IF (D.GT.20000.) XINC=2000.
00393      . . . IF (D.GT.50000.) XINC=5000.
00394      . . . IF (D.GT.100000.) XINC=10000.
00395      . . . IXL = D*DSXPAC
00396      . . . CALL APOS (IXOVR,IYOVR)
00397      . . . CALL VEC (IXL+IXOVR,IYOVR)
00398      . . . DO (XZ=XINC,0,XINC)
00399      . . . . .IX = XZ*DSXPAC + IXOVR
00400      . . . . .CALL APOS (IX,IYOVR)
00401      . . . . .CALL RVEC (0,-7)
00402      . . . . .CALL APOS (IX+3,20)
00403      . . . . .CALL FNMBR (XZ, '(F8.0)')
00404      . . . . .FIN
00405      . . . CALL CHRTYP (1,0,0)
00406      . . . IX = IXOVR + IXL/2 - 120
00407      . . . CALL APOS (IX,0)
00408      . . . CALL TEXT ('DISTANCE ALONG REFERENCE LINE (FT)')
00409      . . . . .FIN

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00410      TO DISPLAY=STRATOGRAPHIC=LAYERS
00411  C ** FIND ALL OF THE DIFFERENT STRATA LAYERS
00412      . . . NLAYER = 0
00413      . . . DO (K=1,NWELL)
00414      . . . . .ADR = IOWELL(K)
00415      . . . . .CALL OPR (IPNT3,ADR,NBUF,106.)
00416      . . . . .DO (J=1,KSTRAT)
00417      . . . . . . . IF (NCODE(J).EQ.700) NCODE(J)=100
00418      . . . . . . . IF (NLAYER.EQ.0)
00419      . . . . . . . . . NLAYER = NLAYER+1
00420      . . . . . . . . . LAYERS(NLAYER) = NCODE(J)
00421      . . . . . . . . . LWELL(NLAYER) = K
00422      . . . . . . . . .FIN
00423  C ** SEE IF LAYER IS ALREADY STORED
00424      . . . DO (I=1,NLAYER)
00425      . . . . . IF (NCODE(J).EQ.LAYERS(I)) GO TO 40
00426      . . . . .FIN
00427  C ** NO--STORE IN ARRAY

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00428      . . . NLayer = NLayer+1
00429      . . . Layers(NLayer) = NCode(J)
00430      . . . LWell(NLayer) = K
00431 40      . . . CONTINUE
00432      . . . FIN
00433 C ** SORT IN ASCENDING ORDER
00434      . . . DO (I=1,NLayer-1)
00435      . . .   NN = I+1
00436      . . .   DO (L=NN,NLayer)
00437      . . .     IF (Layers(L).LT.Layers(I))
00438      . . .       LayTMP = Layers(I)
00439      . . .       LWTMP = LWell(I)
00440      . . .       Layers(I) = Layers(L)
00441      . . .       LWell(I) = LWell(L)
00442      . . .       Layers(L) = LayTMP
00443      . . .       LWell(L) = LWTMP
00444      . . .   . . . FIN
00445      . . . . . FIN
00446      . . . . . FIN
00447      . . . . . FIN
00448 C      WRITE(5,535) (Layers(I),LWell(I),I=1,NLayer)
00449 535      FORMAT(2I5)
00450 C
00451 C ** FIND LOCATION IN WELL
00452      . . . DO (I=1,NLayer)
00453      . . .   KWell = LWell(I)
00454      . . .   ADR = IDWell(KWell)
00455 C      WRITE(5,536) ADR,KWell
00456 536      . . . FORMAT(' ADR,KWell=',F9.0,I5)
00457      . . . CALL OPR (IPNT3,ADR,NBUF,106.)
00458      . . . DO (J=1,KSTRAT)
00459 C      . . . IF (NCode(J).EQ.700) NCode(J)=100
00460      . . . IF (NCode(J).EQ.Layers(I))
00461      . . .   IX = DAlong(KWell)*DSXFAC + IXOVR
00462      . . .   IYTOP = (CS-DDD(J)-YBOT)*DSYFAC + IYOVR
00463      . . .   WHEN (J.EQ.KSTRAT) IYBOT = (CS-TD-YBOT)*DSYFAC + IYOVR
00464      . . .   ELSE
00465      . . .     IYBOT = (CS-DDD(J+1)-YBOT)*DSYFAC + IYOVR
00466      . . .   . . . FIN
00467      . . . . . FIN
00468      . . . . . FIN
00469 C ** NOW FOLLOW IT THRU WELLS
00470      . . . CALL APOS (IX,IYBOT)
00471      . . . IF (KWell.NE.1)
00472 C ** CONNECT TO NEXT HIGHEST STRATA IN LAST WELL(LEFT)
00473      . . .   ADR = IDWell (KWell-1)
00474 C      WRITE(5,537) ADR,IX,IYBOT
00475 537      . . . FORMAT(' ADR,IX,IYBOT=',F9.0,2I4)
00476      . . . CALL OPR (IPNT3,ADR,NBUF,106.)
00477      . . . DO (J=1,KSTRAT)
00478      . . .   IF (NCode(J).EQ.700) NCode(J)=100
00479      . . .   IF (NCode(J).GT.Layers(I))
00480      . . .     IX2 = (DAlong(KWell-1))*DSXFAC + IXOVR
00481      . . .     IY2 = (CS-DDD(J)-YBOT)*DSYFAC + IYOVR
00482      . . .     CALL VEC (IX2,IY2)
00483 C      WRITE(5,538) NCode(J),Layers(I),IX2,IY2

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00484 538      . . . . . FORMAT(' NCODE,LAYERS,IX2,IY2=',4I4)
00485 C      . . . . . WRITE(5,539) DALONG(KWELL-1),DDD(J),CS,YBOT,DSXFAC,
00486 C      1DYFAC,IXOVR,IYOVR
00487 539      . . . . . FORMAT(1X,4F10.1,2F12.3,2I5)
00488      . . . . . GO TO 50
00489      . . . . . ...FIN
00490      . . . . . ...FIN
00491 50      . . . . . CONTINUE
00492      . . . . . ...FIN
00493 C  ** NOW CONNECT TO WELLS TO THE RIGHT
00494      . . . . . CALL APOS (IX,IYBOT)
00495      . . . . . NEWLIN = .FALSE.
00496      . . . . . KWELL = KWELL+1
00497      . . . . . IF (KWELL.LE.NWELL)
00498      . . . . . DO (K=KWELL,NWELL)
00499      . . . . . ADR = IDWELL(K)
00500      . . . . . CALL DPR (IPNT3,ADR,NBUF,106,)
00501      . . . . . DO (J=1,KSTRAT)
00502 C      . . . . . IF (NCODE(J).EQ.700) NCODE(J)=100
00503      . . . . . IF (NCODE(J).GT.LAYERS(I))
00504      . . . . . IX2 = DALONG(K)*DSXFAC + IXOVR
00505      . . . . . IY2 = (CS=DDD(J)=YBOT)*DSYFAC + IYOVR
00506      . . . . . WHEN (NEWLIN) CALL APOS (IX2,IY2)
00507      . . . . . ELSE
00508      . . . . . CALL VEC (IX2,IY2)
00509      . . . . . ...FIN
00510      . . . . . NEWLIN = .FALSE.
00511      . . . . . GO TO 55
00512      . . . . . ...FIN
00513      . . . . . ...FIN
00514      . . . . . NEWLIN = .TRUE.
00515 55      . . . . . CONTINUE
00516      . . . . . ...FIN
00517      . . . . . ...FIN
00518      . . . . . ...FIN
00519      . . . . . ...FIN

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00520      TO DISPLAY=LAYER=NUMBERS
00521      . . . . . CALL SUBOF (LPNM8R,1300,ILP)
00522      . . . . . ILP = 2
00523      . . . . . CALL CHRSEL (0)
00524      . . . . . CALL INTENS (5)
00525      . . . . . CALL LPHIT (1)
00526      . . . . . DO (L=1,NLAYER)
00527      . . . . . ID = LAYERS(L)
00528      . . . . . DO (K=1,NWELL)
00529      . . . . . ADR = IDWELL(K)
00530      . . . . . CALL DPR (IPNT3,ADR,NBUF,106,)
00531      . . . . . DO (J=1,KSTRAT)
00532      . . . . . IF (NCODE(J).EQ.LAYERS(L))
00533      . . . . . IX = DALONG(K)*DSXFAC + IXOVR
00534      . . . . . IYT = (CS=DDD(J)=YBOT)*DSYFAC + IYOVR
00535      . . . . . WHEN (J.EQ.KSTRAT) IYB=(CS=TO=YBOT)*DSYFAC + IYOVR
00536      . . . . . ELSE

```

```

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00537      . . . . . IYB = (CS*000(J+1)-YBOT)*OSYFAC + IYOVR
00538      . . . . . CALL APOS (IX,IYB)
00539      . . . . . CALL RVEC (4,0)
00540      . . . . . ...FIN
00541      . . . . . IY = IYB*(IYT-IYB)/2 + 3
00542      . . . . . CALL NAME (ID)
00543      . . . . . CALL APOS (IX,IY)
00544      . . . . . CALL INMBR (ID,'(I3)')
00545      . . . . . ...FIN
00546      . . . . . ...FIN
00547      . . . . . ...FIN
00548      . . . . . ...FIN
00549      . . . . . CALL LPHIT (0)
00550      . . . . . CALL ENOSB
00551      . . . . . ...FIN

```

```

-----
00552      TO SETUP=INITIAL=DISPLAYS
00553      C      .
00554      .      CALL SUBOF (LA02,120)
00555      .      CALL CHRSC (1)
00556      .      CALL APOS (345,1000)
00557      .      CALL TEXT ('WELL STRATIFICATION CROSS SECTION')
00558      .      CALL AREA (1)
00559      .      CALL INTENS (3)
00560      .      CALL CHRSC (0)
00561      .      CALL APOS (0,200)
00562      .      CALL TEXT ('NOTE: MOVE TRACKING CROSS TO DESIRED',-15)
00563      .      CALL TEXT ('      POSITION WITH JOY STICK THEN',-15)
00564      .      CALL TEXT ('      SELECT CODE WITH LIGHT PEN TO',-15)
00565      .      CALL TEXT ('      DISPLAY STRATA LABEL,')
00566      .      CALL AREA (0)
00567      .      CALL ENOSB(1521)
00568      C      .
00569      .      CALL SUBOF (LBUT,250,0)
00570      .      CALL AREA (1)
00571      .      CALL CHRSC (0)
00572      .      CALL INTENS (4)
00573      .      CALL APOS (0,900)
00574      .      CALL TEXT ('      LIGHT PEN OPTIONS')
00575      .      CALL INTENS (7)
00576      .      CALL APOS (0,885)
00577      .      CALL BOX (150,40)
00578      .      CALL APOS (5,890)
00579      .      CALL BOX (140,30)
00580      .      CALL MENU (850,30,1,' DISPLAY MAP',' REMOVE STRATA CODES',
00581      1. ' DISPLAY STRATA CODES',' REMOVE STRATA LABELS',
00582      2. ' WRITE PLOT FILE',' STOP')
00583      .      CALL MENU (600,30,7,' SET START OF LINE',' SET END OF LINE',
00584      1. ' DELETE LINE')
00585      .      CALL LPHIT (1)
00586      .      CALL ENOSB(1522)
00587      C      .      WRITE(5,599) 1521,1522
00588      599      .      FORMAT(' 1521,1522=',2I5)
00589      .      ...FIN

```

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00590 END

PROCEDURE CROSS-REFERENCE TABLE

00254 DISPLAY=DELETED=WELL=NAME\$
00208 00226

00520 DISPLAY=LAYER=NUMBERS
00322

00350 DISPLAY=SCALE
00295

00337 DISPLAY=STAR
00096

00410 DISPLAY=STRATOGGRAPHIC=LAYERS
00320

00239 SETUP=ARRAYS=REMOVING=ANY=DELETED=WELLS
00054 00209 00227

00552 SETUP=INITIAL=DISPLAYS
00043

00277 SETUP=NEW=CROSS=SECTION=DISPLAY
00056 00210 00228

(FLECS VERSION 22,46)

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Projected to the NW-SE Reference Line

Reference Line Running Southwest to Northeast
Through the WIPP Site

WELL STRATIFICATION CROSS SECTION

A-101

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