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LABORATORY

LLNL-TR-655933

Basic data report for emplacement hole U2ez

J. L. Wagoner

June 16, 2014

Disclaimer

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

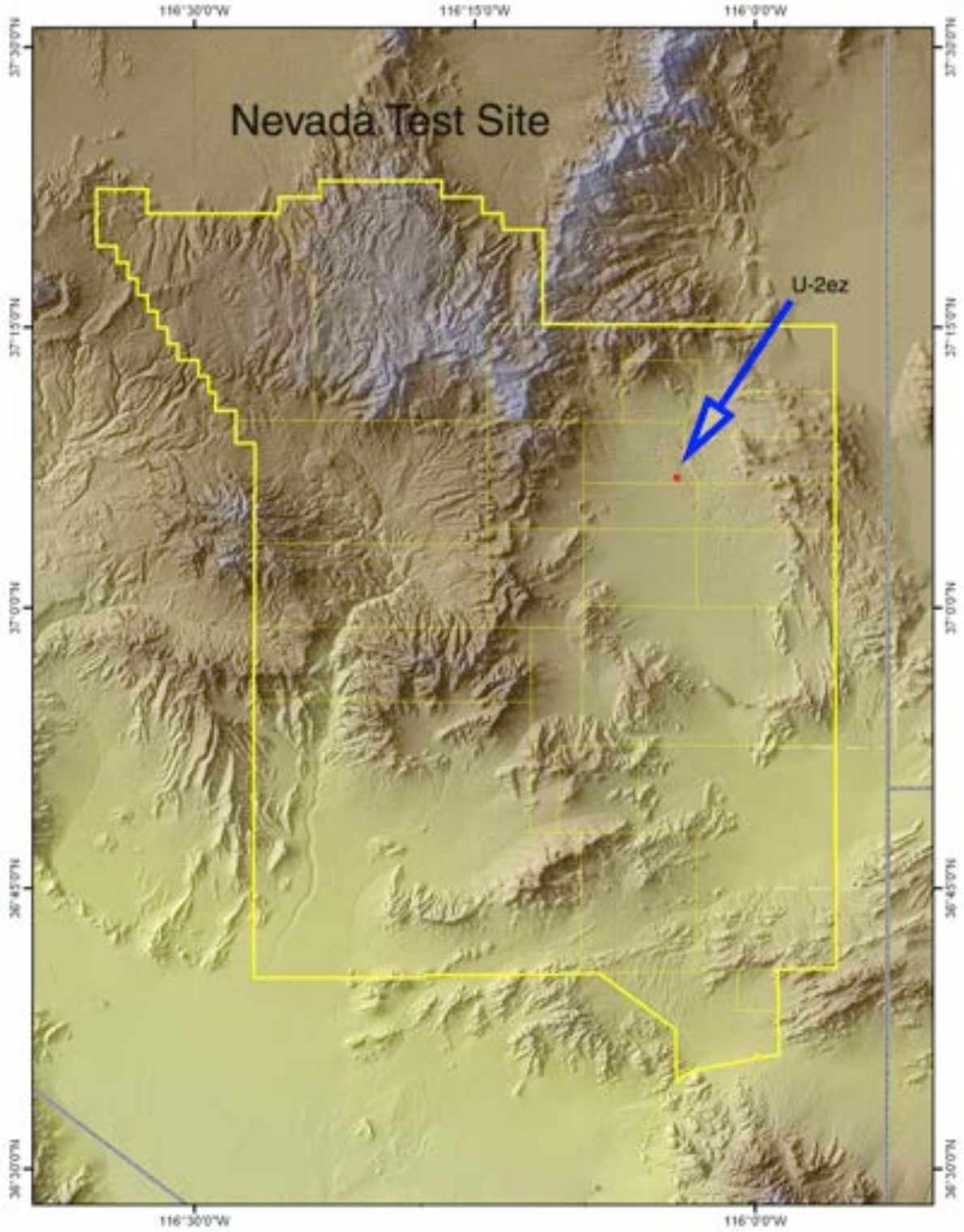

Figure 1. Emplacement hole U2ez is located at Nevada state plane coordinates N262516 E205570 at an elevation of 1285m in southeastern Area 2. The hole was completed on 11/17/83 to a total depth of 396m. The hole terminated in mixed alluvium and did not penetrate the Tertiary volcanic rocks.

Table 1

Emplacement Hole U2ez Site Data Summary

Site Coordinates	Nevada State Plane (central zone) (NAD 83): N 6205575 E 610113 Nevada State Plane (central zone) (NAD 27): N 262516 E 205570 Universal Transverse Mercator (Zone 11)(NAD 83): N 4051267 E 639897 Latitude: 36.5966444 Longitude: -115.4359787
Surface Elevation	1285 m
Drilled Depth (TD)	396 m
Current Depth	395.4 m (5/02)
Hole Diameter at TD	2.44 m
Hole completion date	11/20/83
Depth to Water Table	539 m +/- 30 m (est.)
Surface Geology	Recent alluvium
Geology at TD	Quaternary mixed alluvium

Figure 2. Aerial photo of the U2ez emplacement site (conventional pre-shot air photos do not exist for the site).

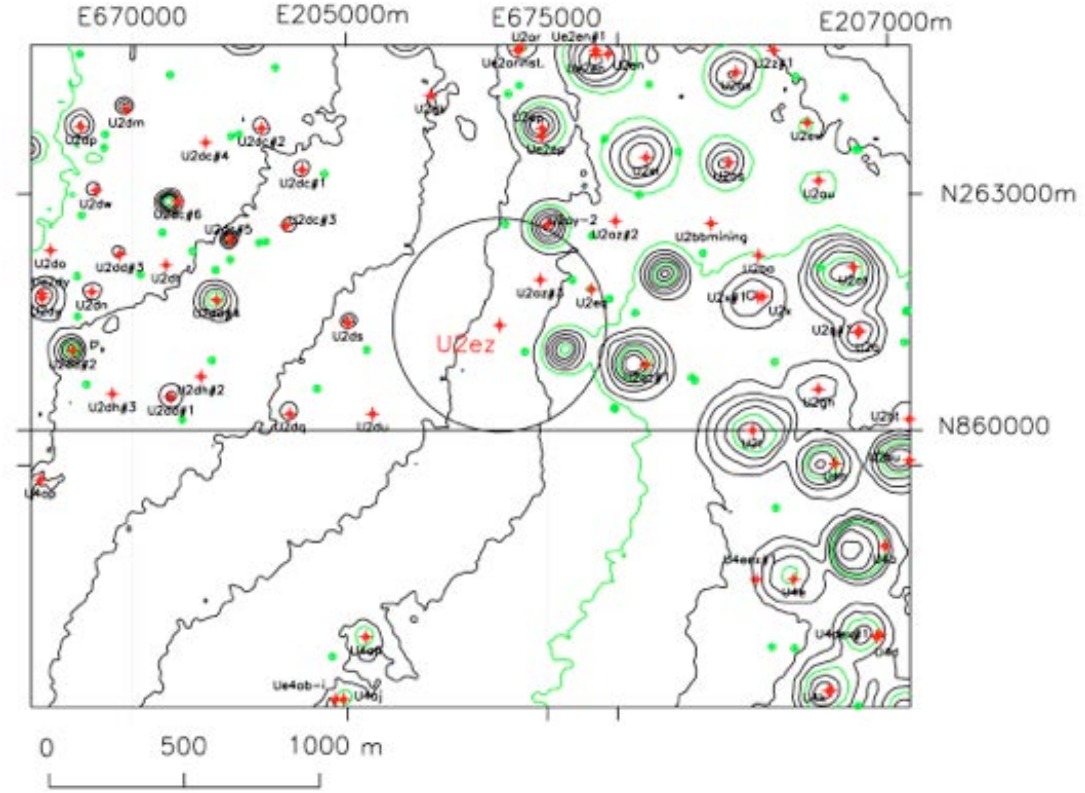

Figure 3. Topographic map of the U2ez emplacement site.

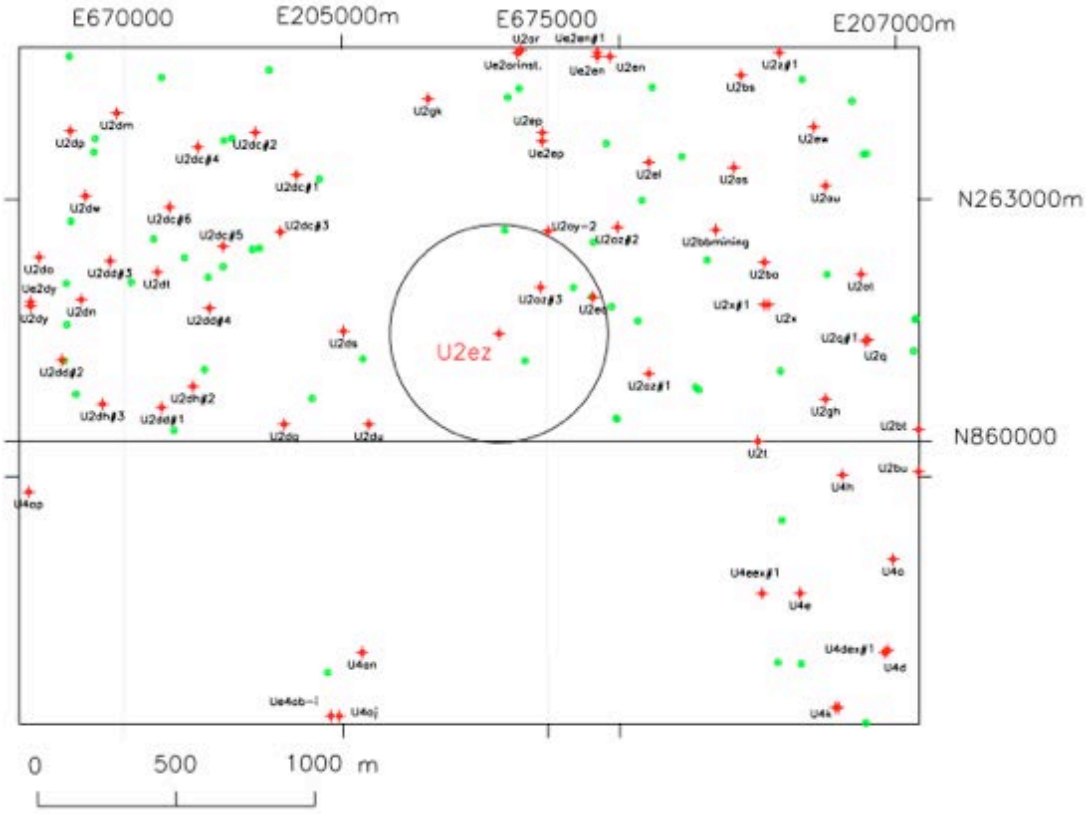

Figure 4. U2ez hole location map. Green symbols indicate post-shot borehole collars.

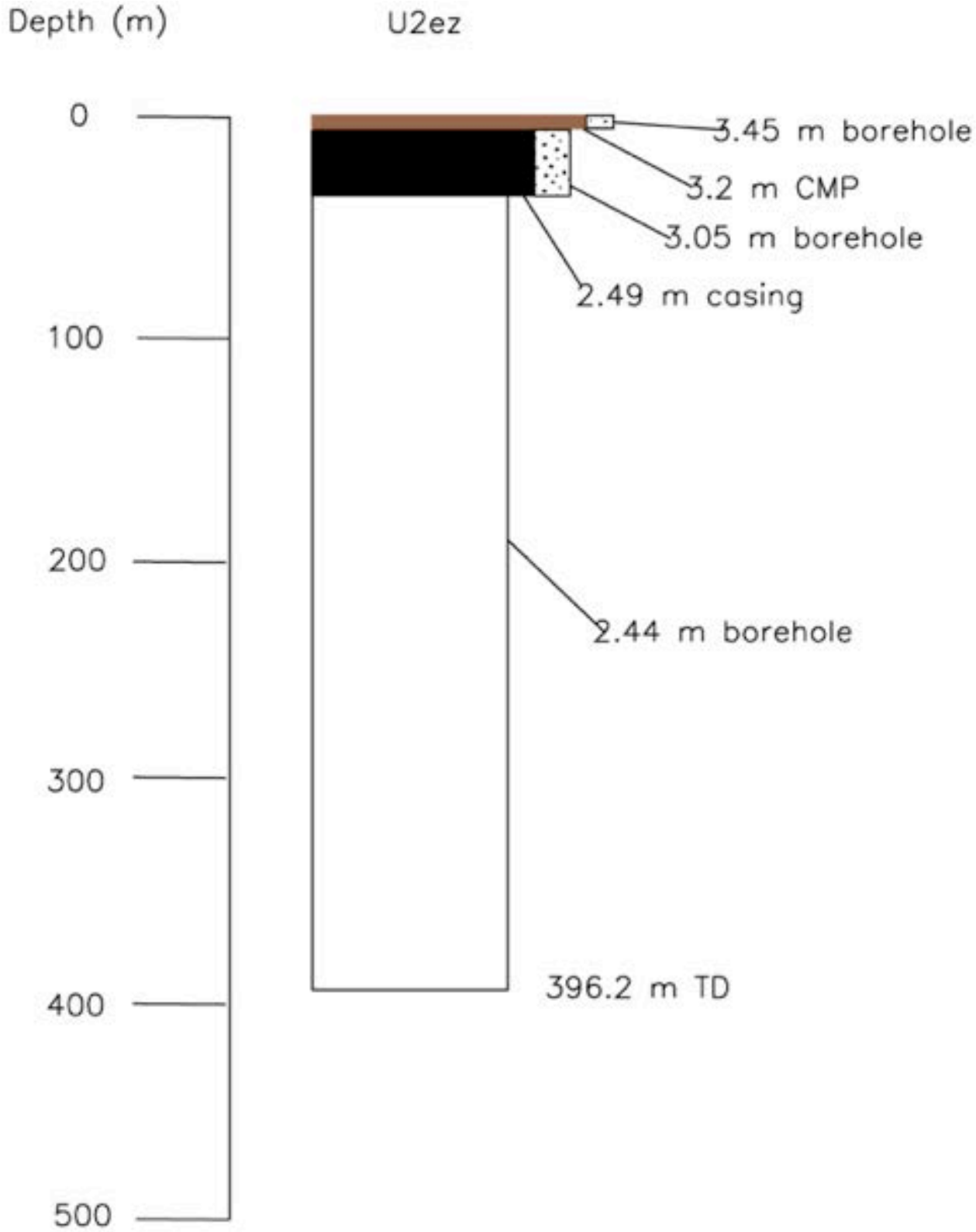

Figure 5. As-built hole construction for U2ez. The hole was completed 11-20-83.

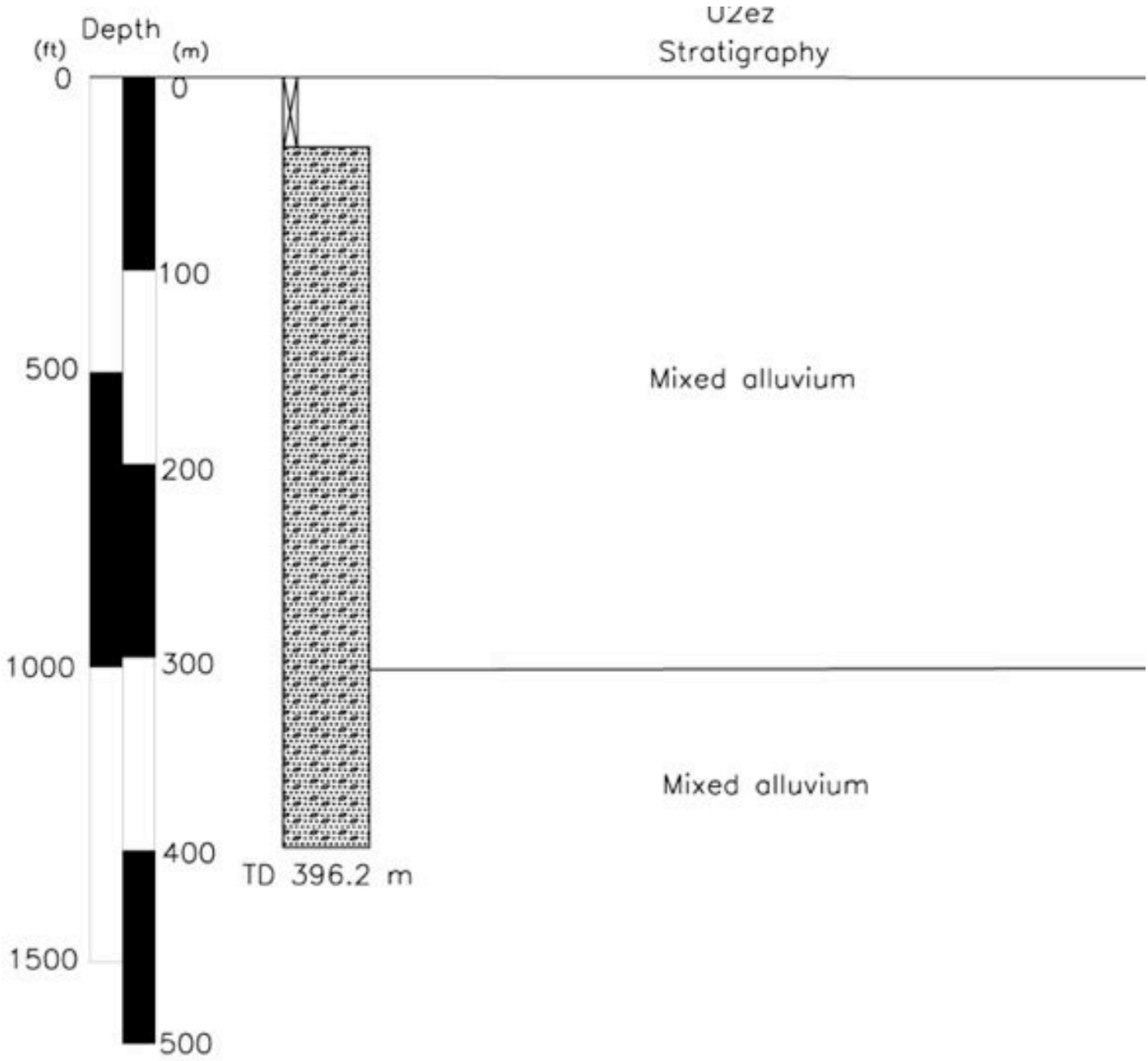

Figure 6. Generalized stratigraphic section for U2ez. The entire section is mixed alluvium, consisting of interbedded sand and gravel. From 0-305m depth, clasts of Paleozoic rocks (mainly Eleana) are much greater than clasts of volcanic rocks. From 305m to TD, clasts of volcanic rocks are generally more common than clasts of Paleozoic sedimentary rocks. Secondary carbonate is common throughout the section. There were no faults identified in the downhole photography. A more detailed lithologic section will be generated when the downhole fisheye video becomes available.

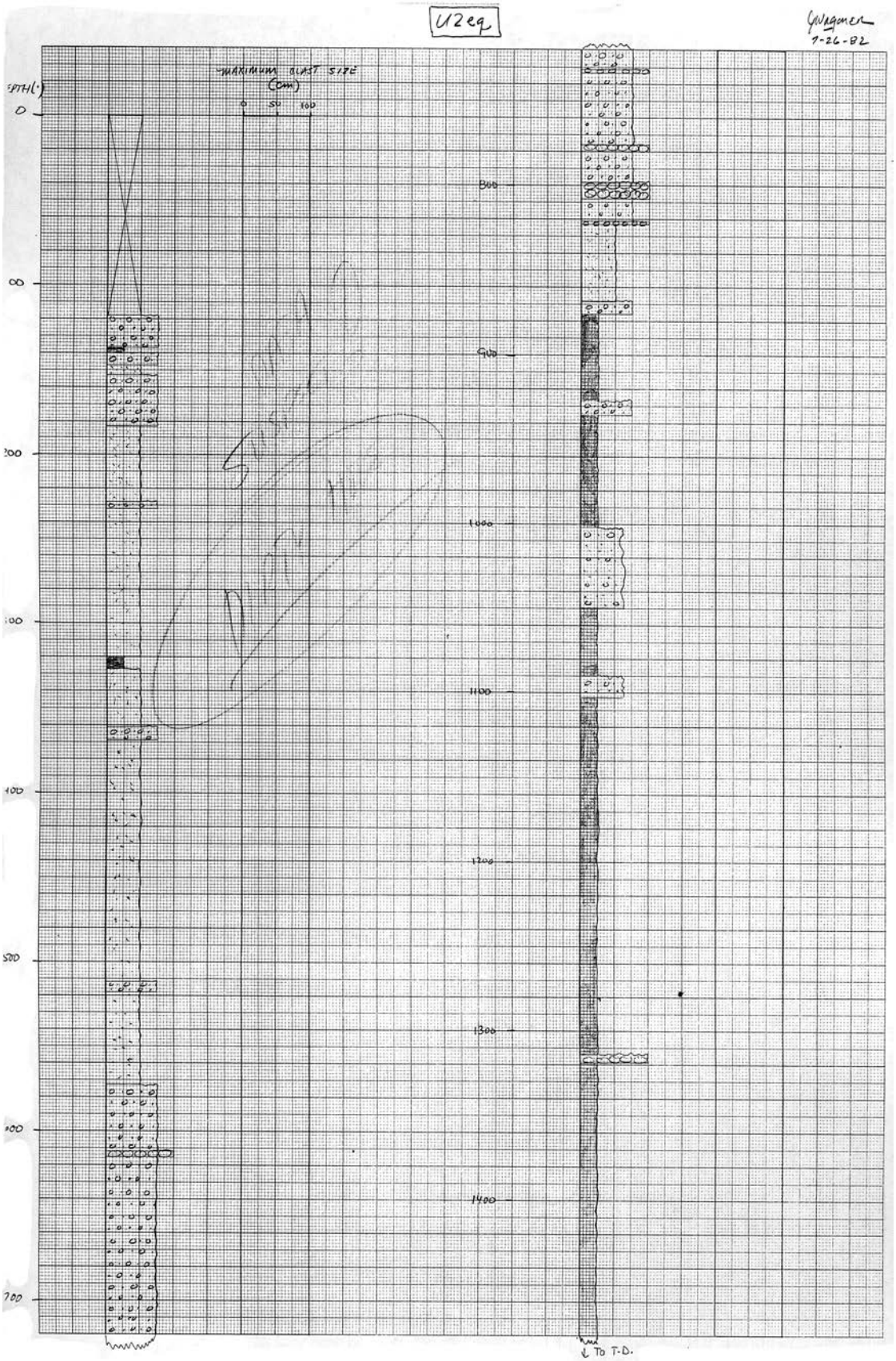

Figure 7. This is a detailed lithology log of the alluvial section at U2eq, and emplacement hole located 360m northeast of U2ez. This log shows the variation in grain size for the alluvial sediments (depth in feet). These data are generated from the downhole fisheye photography. A similar stratigraphic log will be generated for U2ez.

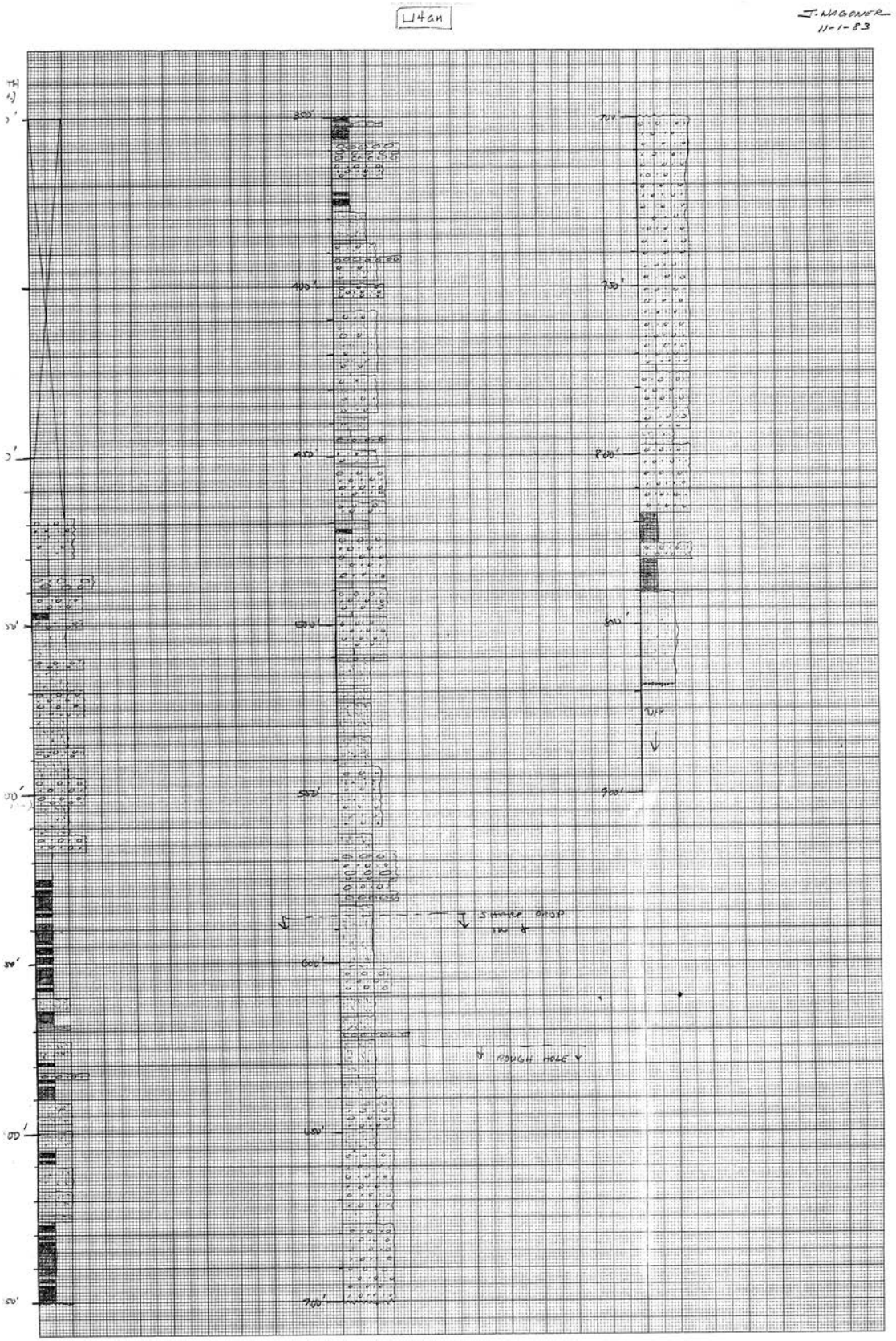

Figure 8. This is a detailed lithology log of the alluvial section at U4an, and emplacement hole located 1250m southwest of U2ez. This log shows the variation in grain size for the alluvial sediments (depth in feet). These data are generated from the downhole fisheye photography. A similar stratigraphic log will be generated for U2ez.

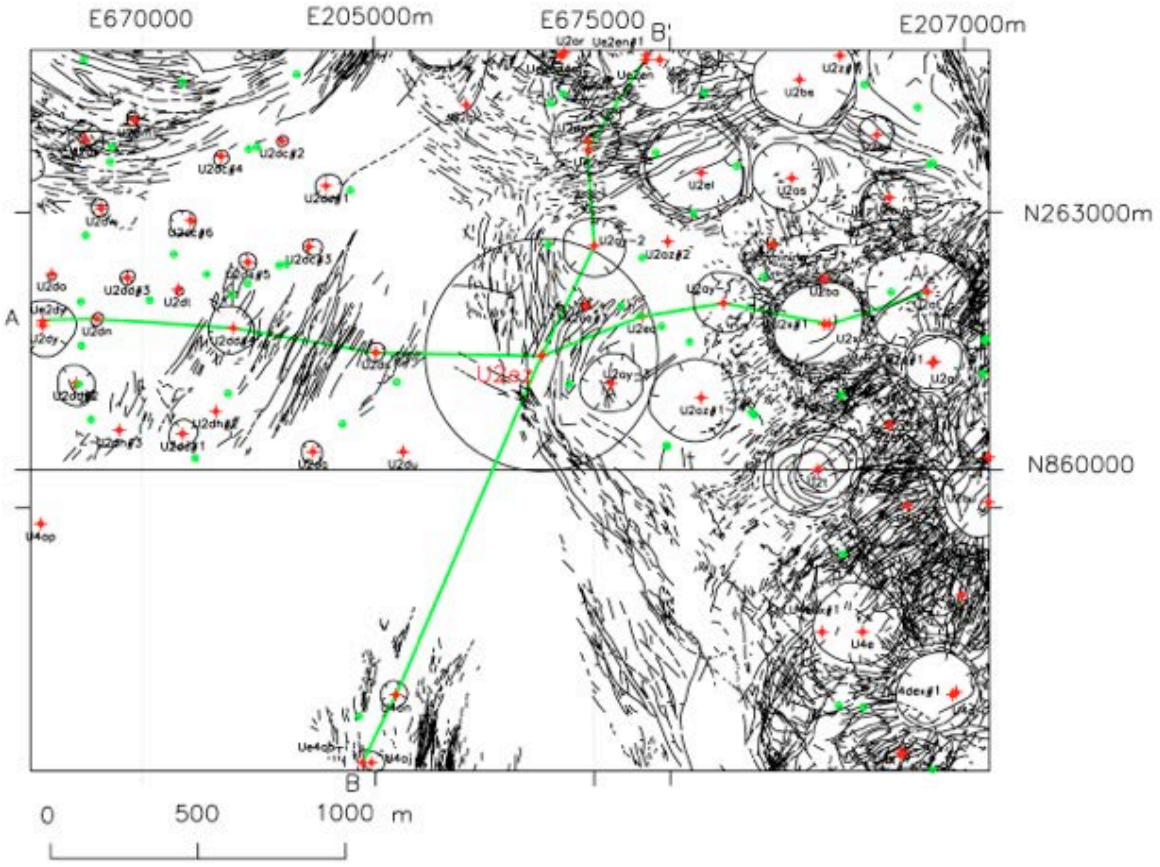

Figure 9. Surface effects map for the U2ez emplacement site (data are from Grasso, 2001). Lines of the cross sections are also shown in light green.

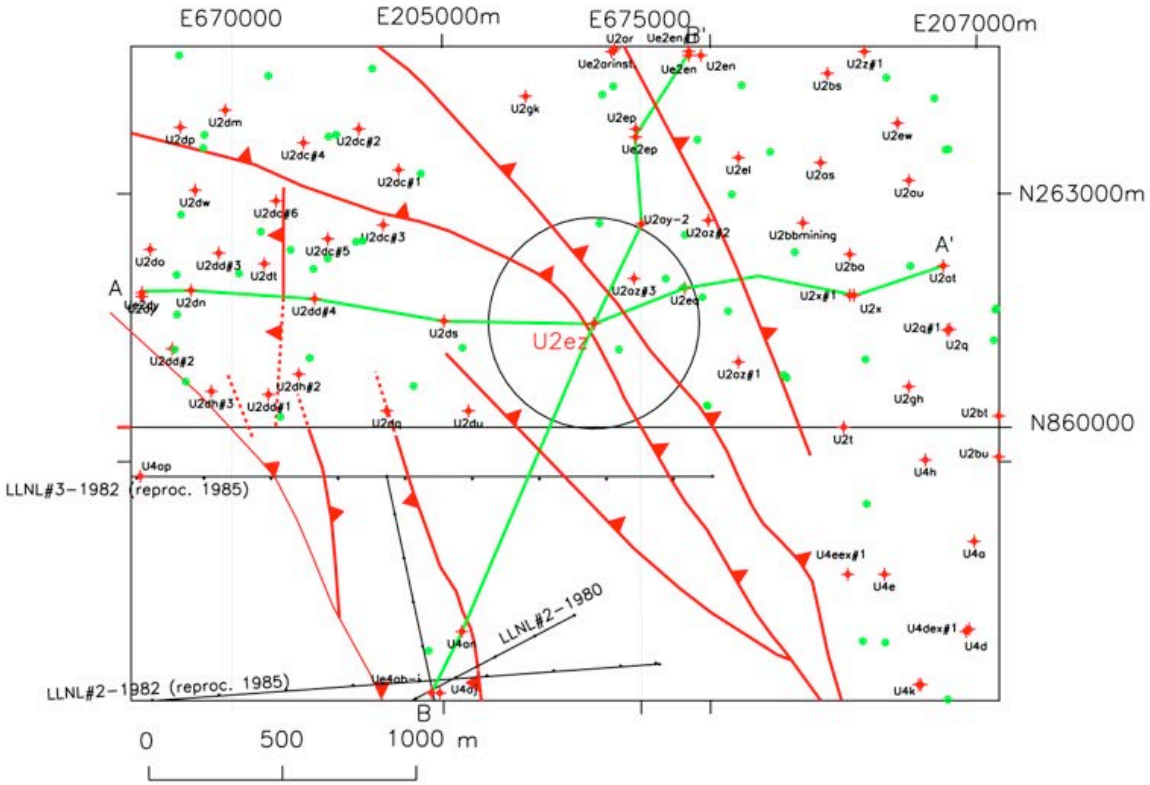

Figure 10. Structure map, showing the fault locations at the surface of the Paleozoic bedrock. Lines of the cross sections are also shown in light green.

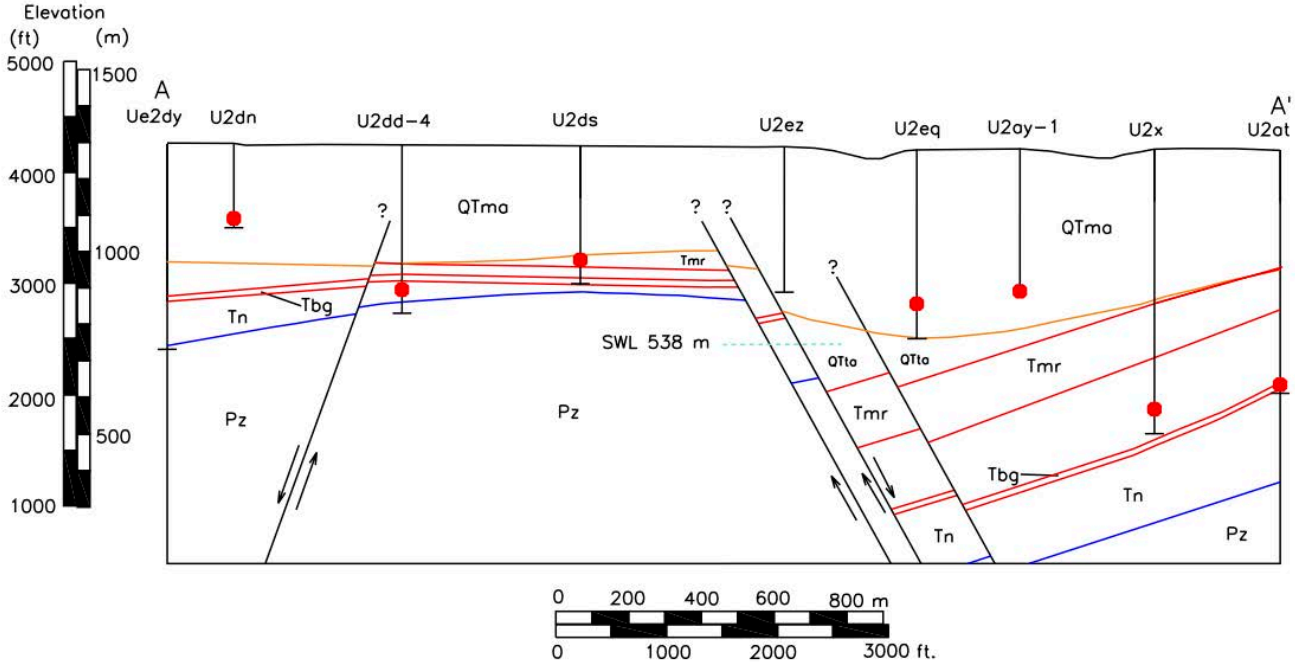

Figure 11. Geologic cross section A-A'. Work point locations (red symbols) are shown for nearby events. Symbol diameter does not reflect the actual cavity size.

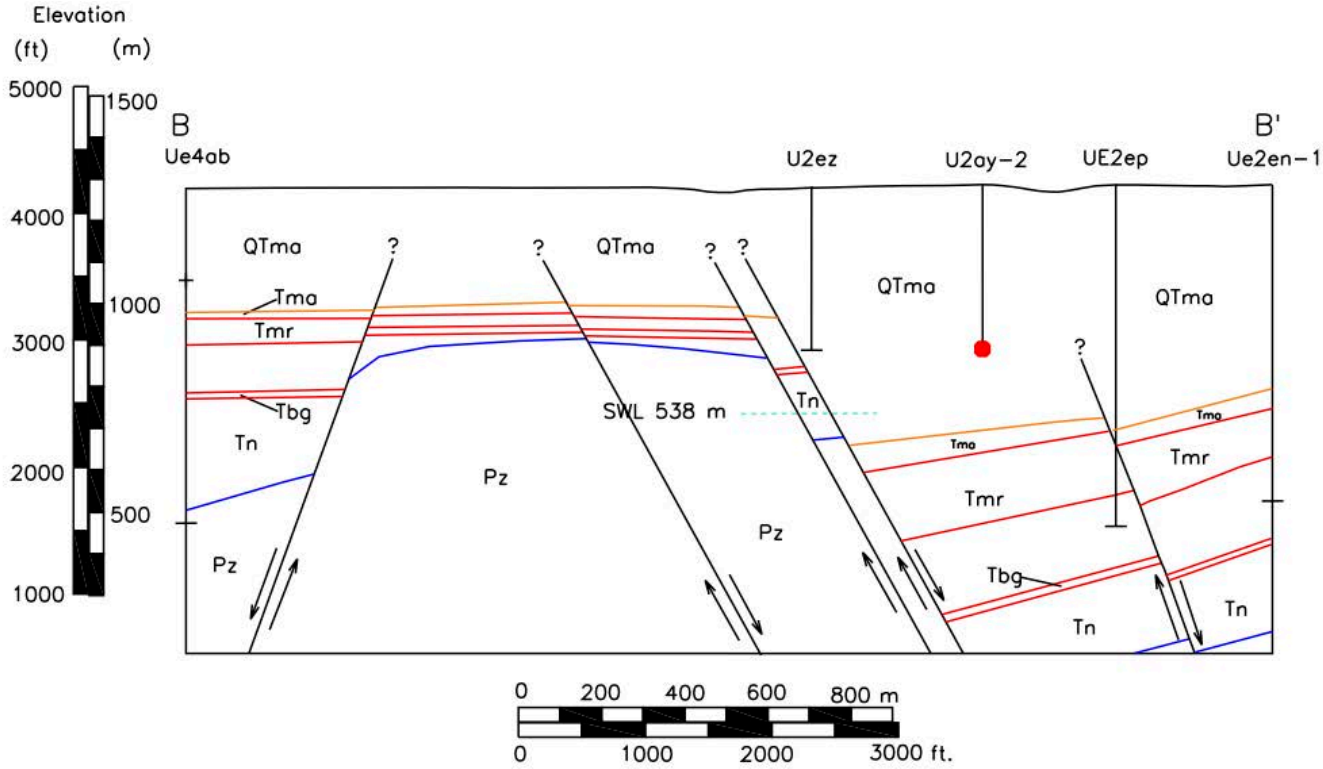

Figure 12. Geologic cross section B-B'. Work point locations (red symbols) are shown for nearby events. Symbol diameter does not reflect the actual cavity size.

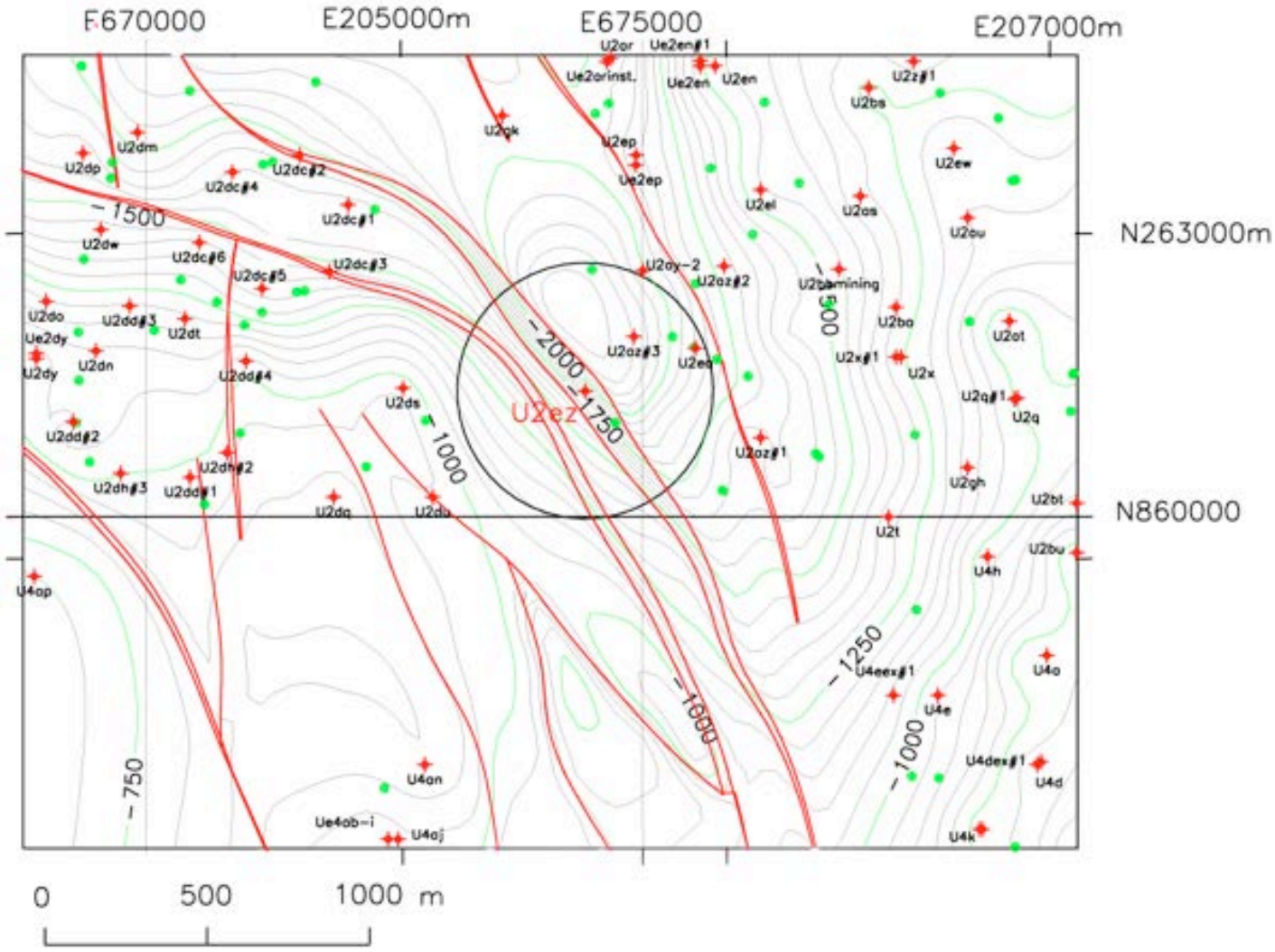

Figure 13. Depth (m) to the top of the pre-Tertiary basement rocks.

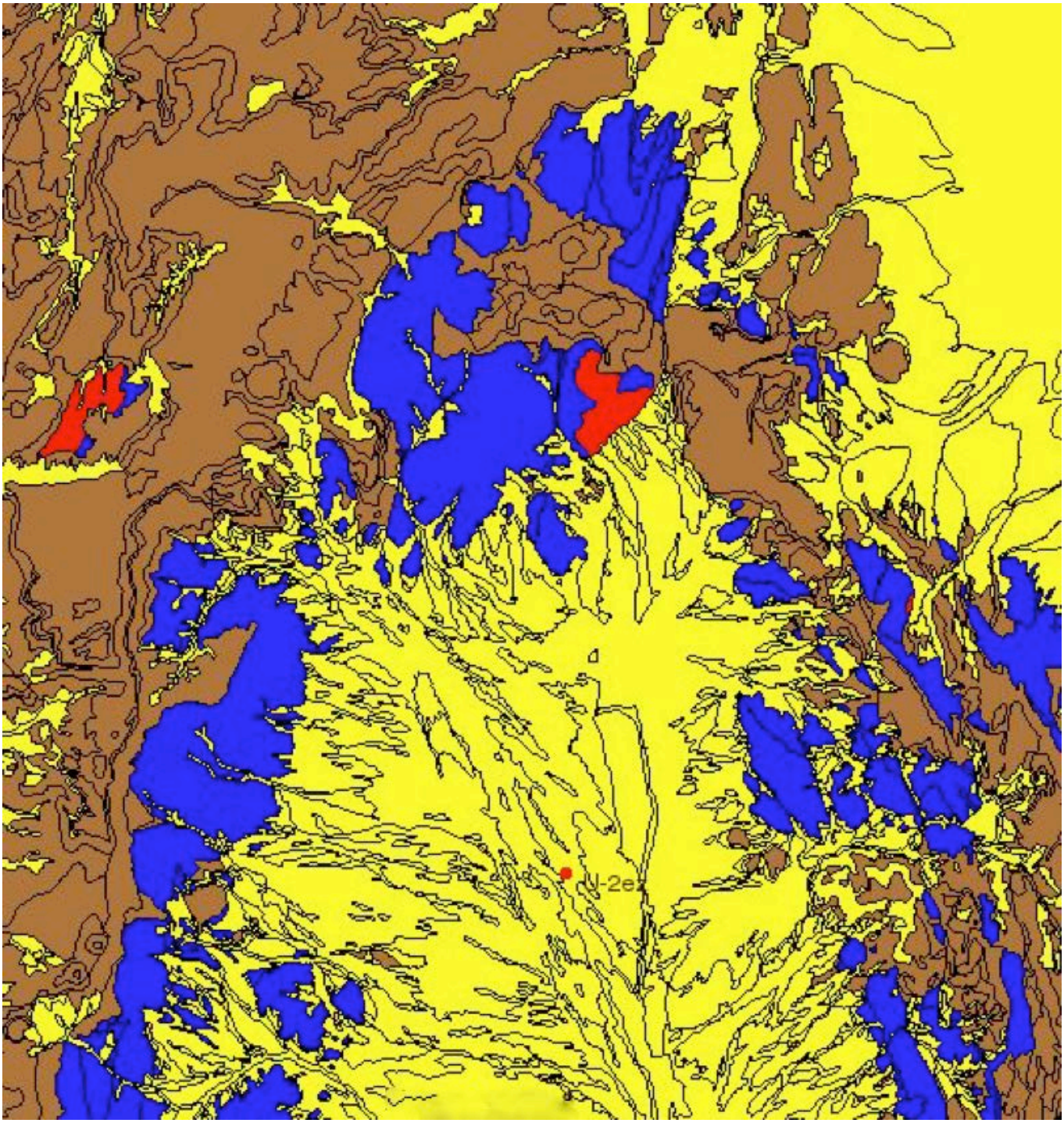

Figure 14. Generalized geologic map of the U2ez emplacement site. Color code: yellow=alluvium; brown= Tertiary volcanic rocks; blue= pre-Tertiary sedimentary rocks; red=Cretaceous granitic rocks.

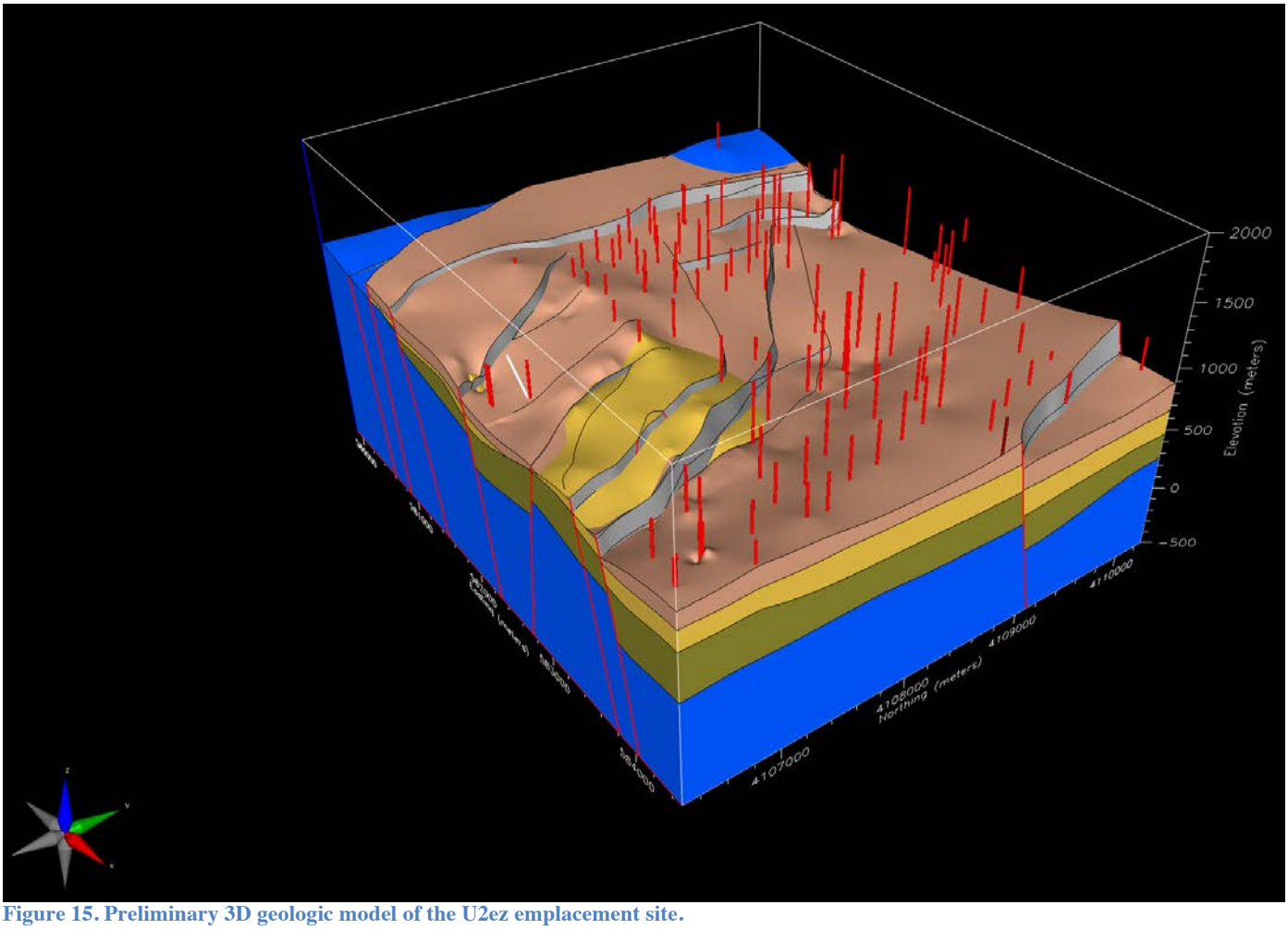

Figure 15. Preliminary 3D geologic model of the U2ez emplacement site.

Table 2
Inventory of Geophysical Logs for U2ez

Log	Run #	Date	Interval
Caliper	run 1	11/19/83	27-395m
Density	run 1	12/21/83	9-392m
Electric	run 1	12/21/83	27-391m
Gamma	run 1	12/21/83	27-396m
Magnetic	run 1	10/4/83	50-395m
Neutron	run 1	12/21/83	27-395m
Seismic	run 1	12/21/83	30-390m

Table 3
Inventory of Geologic Samples for U2ez

Sample Type	Depth Intervals	Storage Location
Drill Cuttings	39.6-396.2 m	USGS Core Library in Mercury, NV

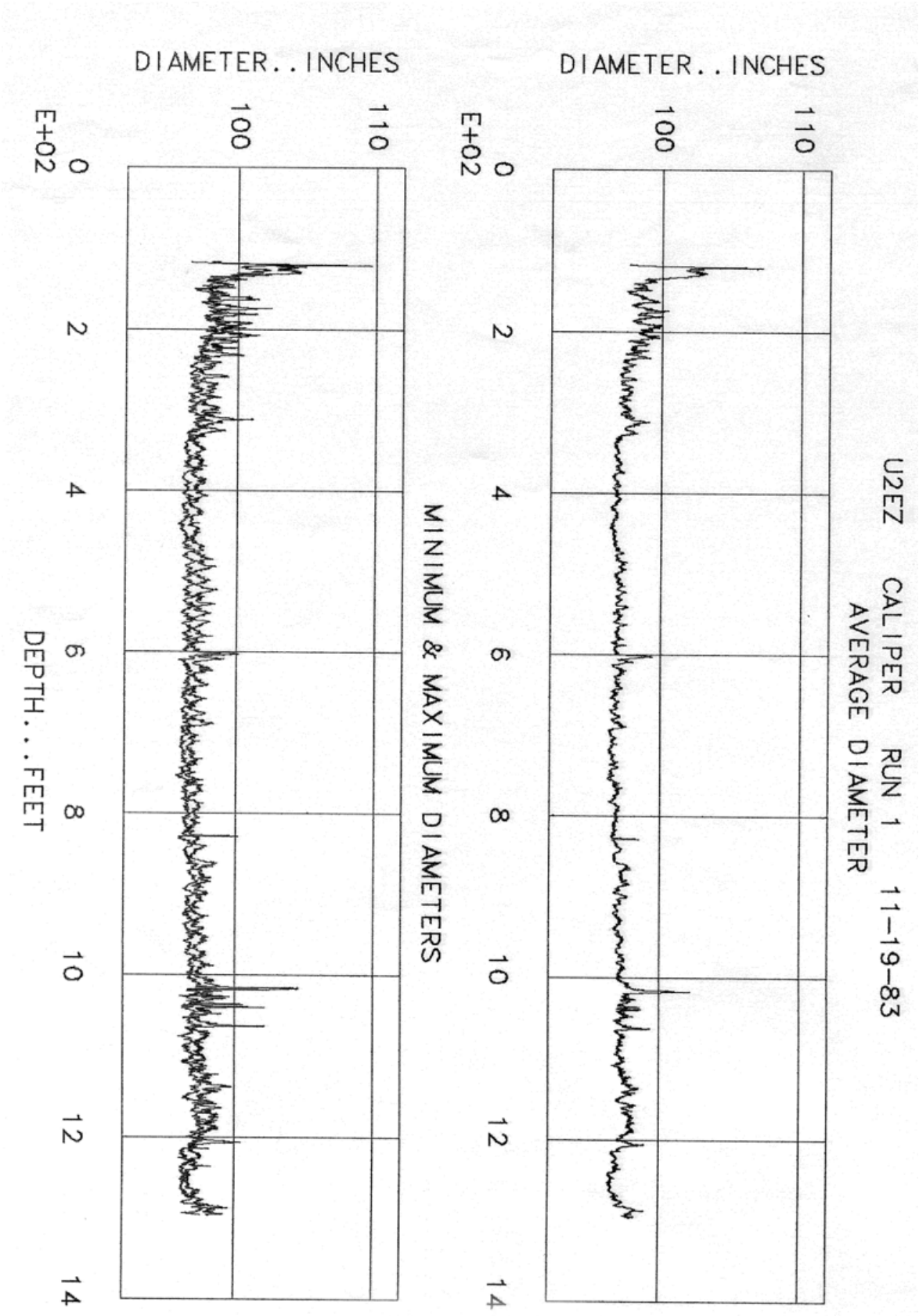

Figure 16. U2ez caliper log.

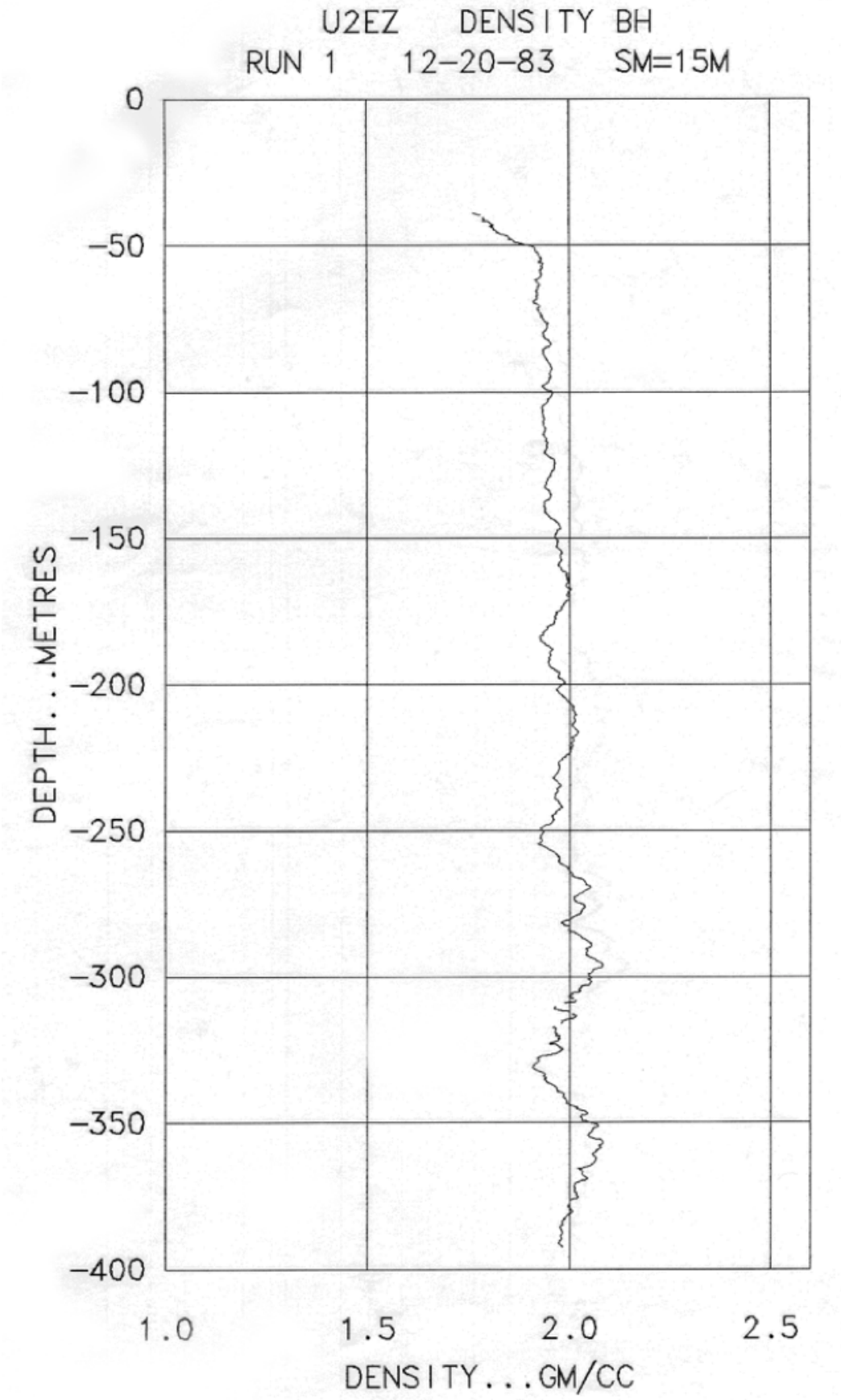

Figure 17. Density log for U2ez.

U2EZ ELOG BHDH RUN 1 12-21-83
FUMBLE VERSION 15 COMPILED 10-27-83
2EZ/ECOR1 RUN BY NORMAN AT 13:41:02 U 01/11/84
DEPTH..FT CORRECT-RES RAW-RESIST CURRENT CONDUCTIVITY

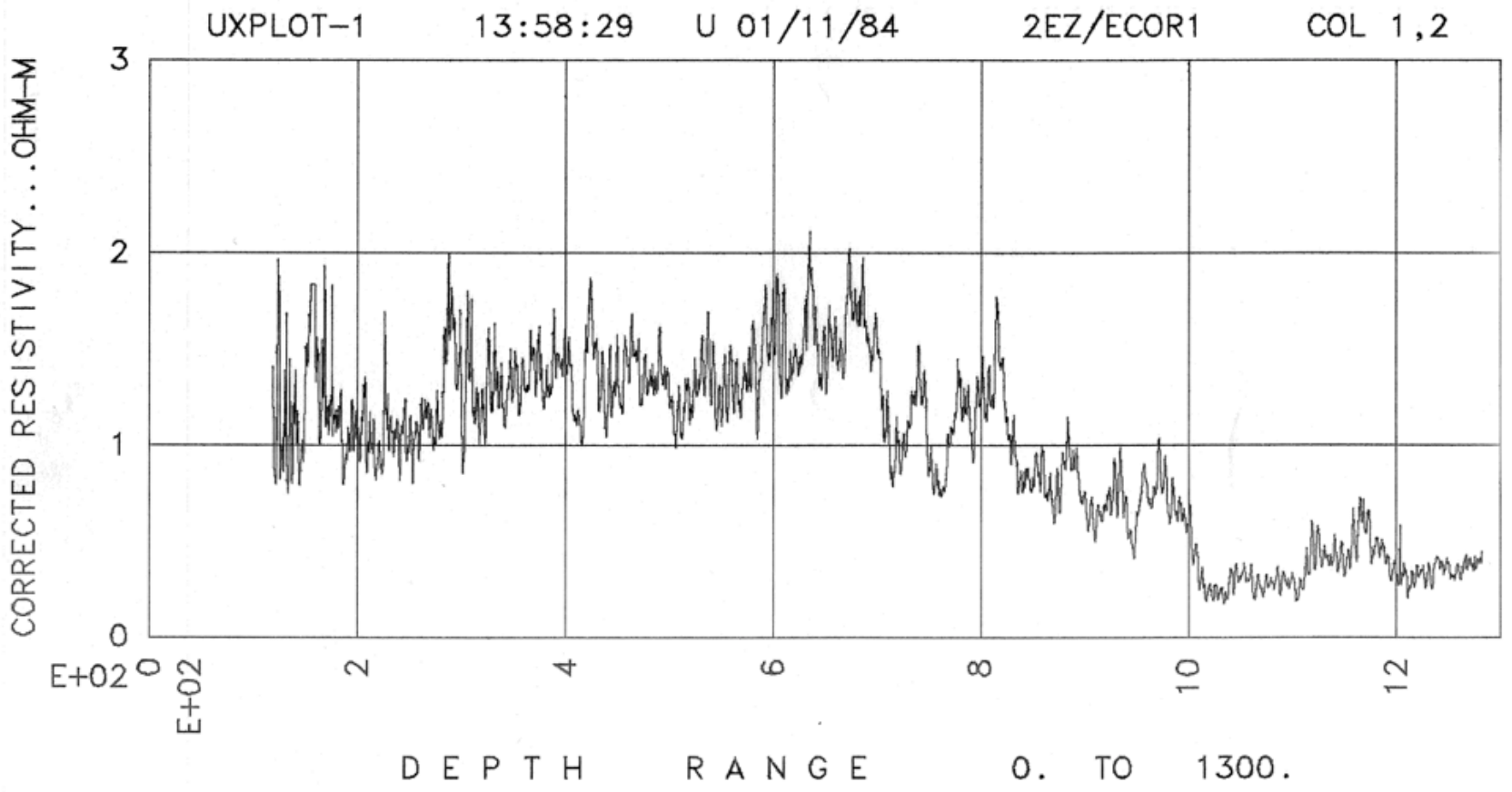

Figure 18. Resistivity log for U2ez.

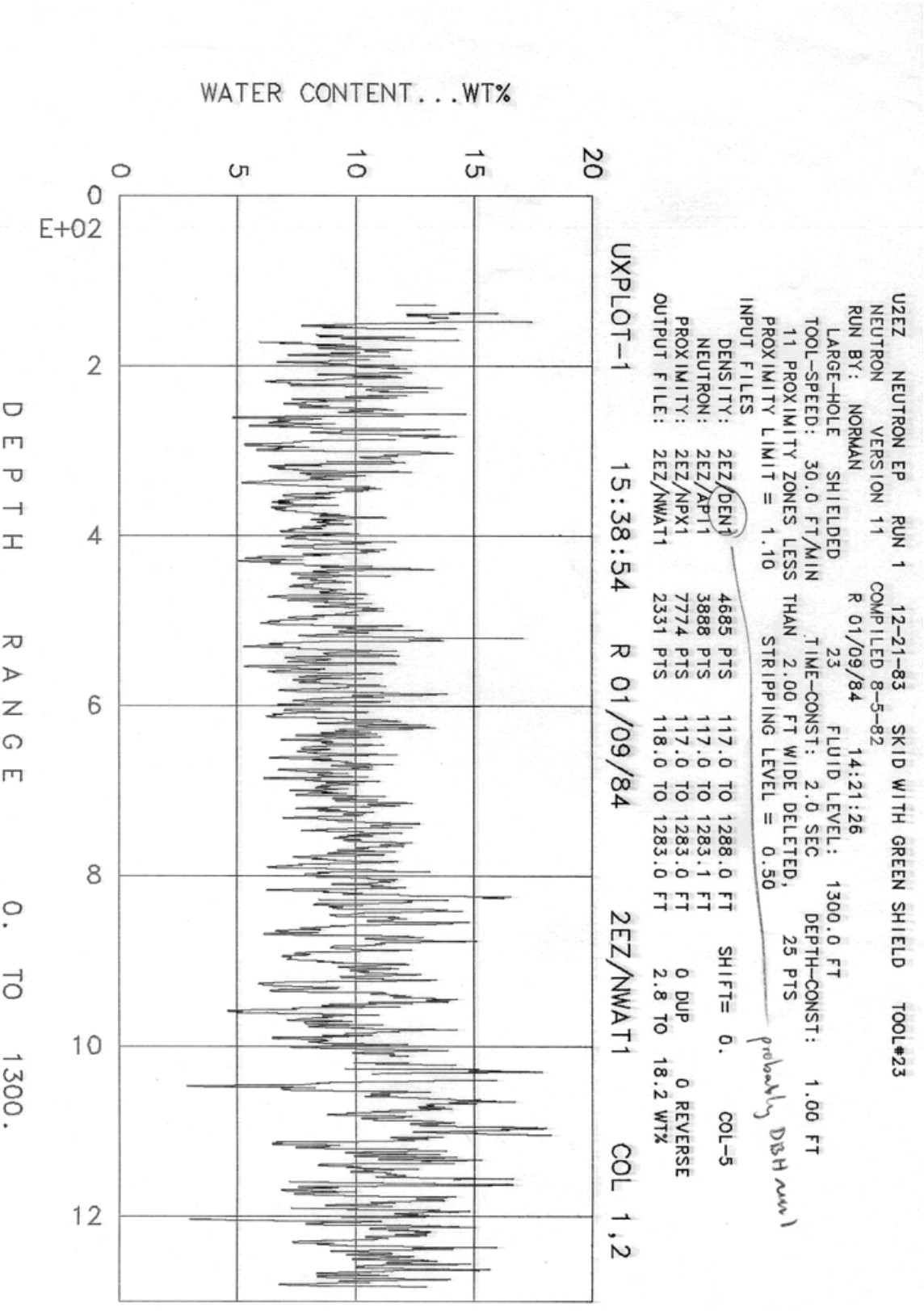

Figure 19. Neutron log for U2ez.

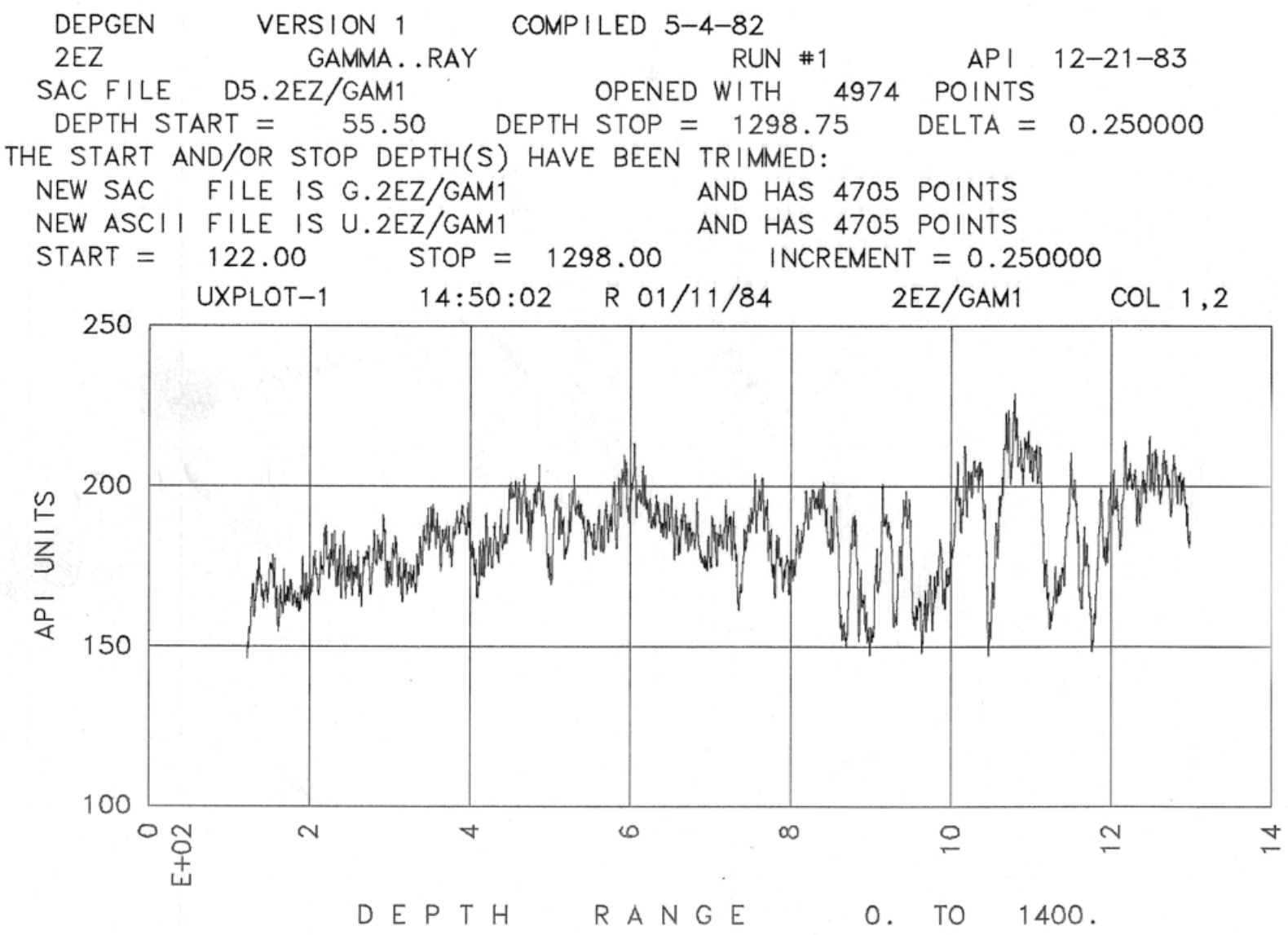

Figure 20. Natural gamma log for U2ez.

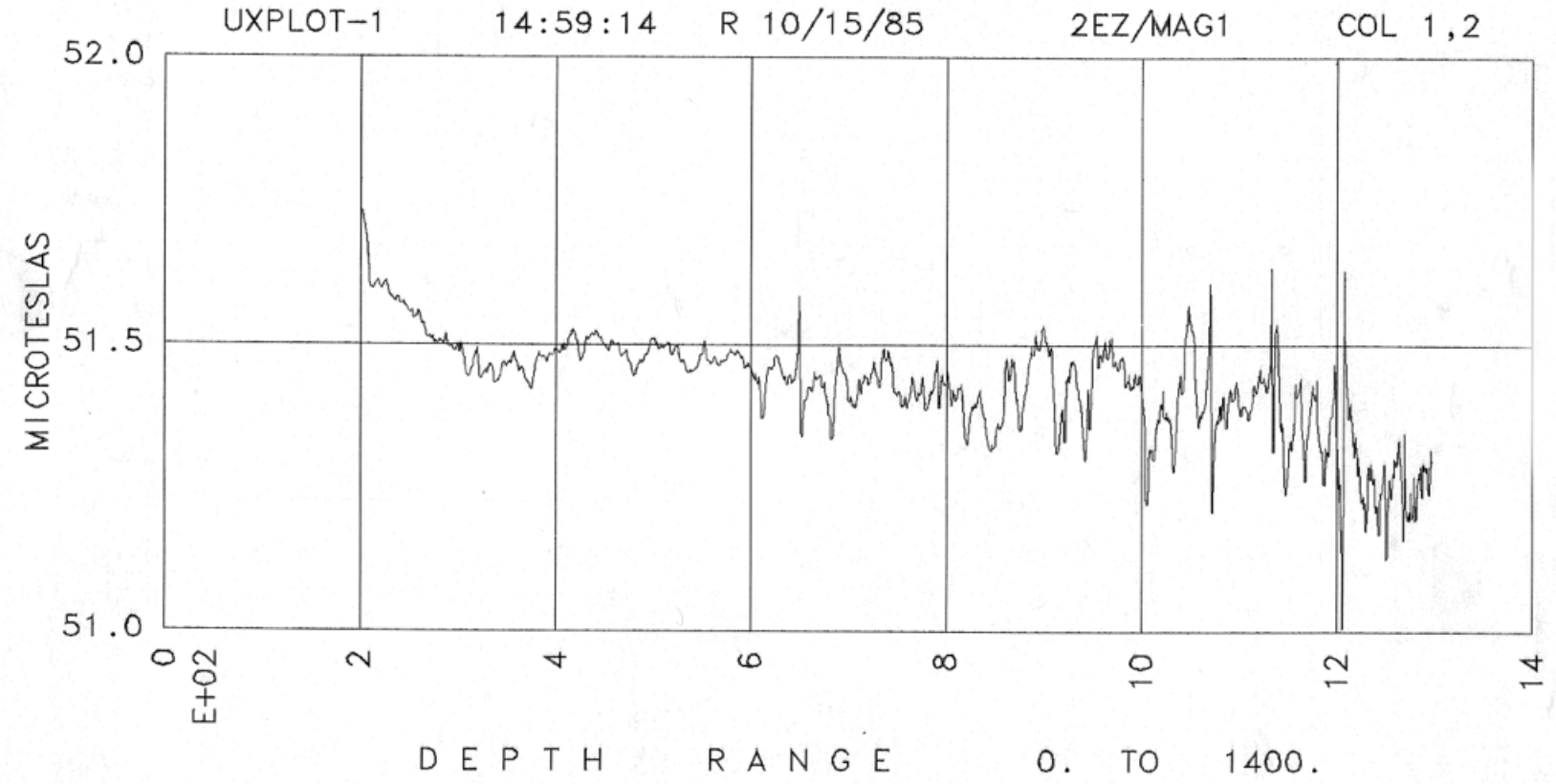

Figure 21. Magnetometer log for U2ez.

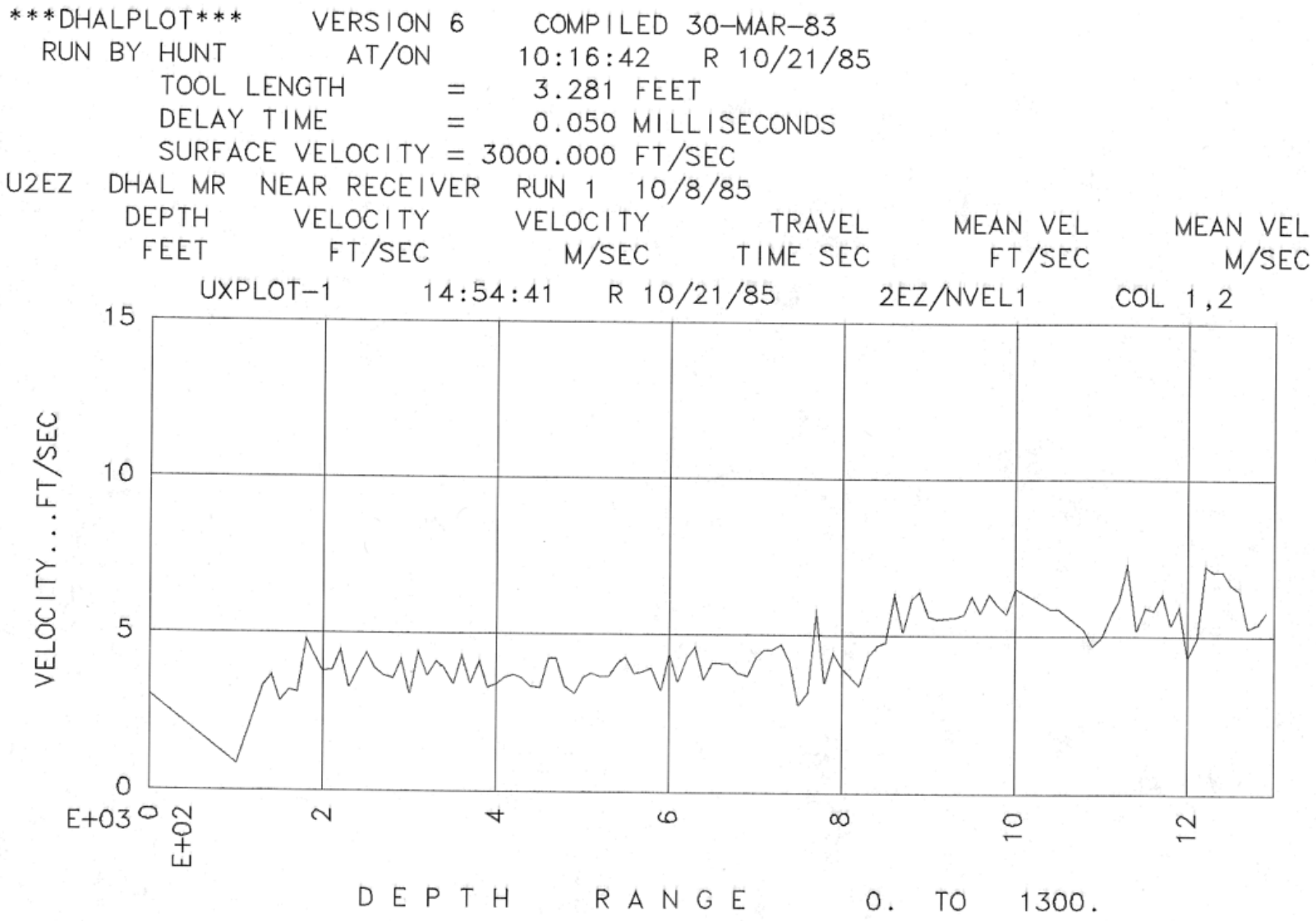

Figure 22.Velocity log for U2ez.

Interdepartmental letterhead

Mail Station L- 777

Ext: 0250

GN-84-11 January 30, 1984

MEMORANDUM:

TO: Nancy Howard/Jeff Wagoner

FROM: Casey Schmidt

SUBJECT: U2ez, CO_2 ANALYSES

The following unwashed cutting samples were analized at the REECo Environmental Lab on January 23 & 24, 1984. The completion date of the hole was November 17, 1983.

Depth	%CO_2		
	#1	#2	#3
900	0.8	1.0	
920	3.3	3.0	
940	0.1	0.4	0.2
960	0.2	0.1	
980	0.1	0.2	
1000	0.1	0.2	
1020	0.1	<0.1	
1040	0.4	0.3	
1060	0.8	0.4	0.9
1080	0.1	0.1	
1100	<0.1	<0.1	
1120	2.3	2.0	
1140	0.2	0.4	0.1
1160	2.3	2.2	
1180	1.9	2.0	
1200	11.3	9.8	9.8

Casey Schmidt.
Casey Schmidt

CSS:krm

cc:
W. McKinnis
R. Draper

University of California
LAWRENCE LIVERMORE LABORATORY

Figure 23. CO2 analysis #1 for cuttings samples in U2ez.

Nuclear Test Operations

Interdepartmental letterhead

Mail Station L- 777

Ext: 6339

GN-86-14 February 3, 1986

MEMORANDUM:

TO: Jeff Wagoner

FROM: W. B. McKinnis

SUBJECT: U2ez, ADDITIONAL CO_2 ANALYSES

Ref: GN-84-11, 1-30-84.

Following are CO_2 analyses in addition to those reported in the referenced memo.

Depth	%CO_2	Date
1220	0.1; 0.1	1-17-86
1240	2.2; 0.7; 2.2	1-17-86
1260	2.0; 3.4; 0.8; 2.0	1-17-86
1280	1.9; 1.6	1-17-86
1300	0.4; 1.4; 1.4	1-17-86
1110	0.7; 0.8; 0.7	1-31-86
1130	2.8; 2.5; 2.8	1-31-86
1150	0.5; 1.4; 0.9; 0.5	1-31-86
1170	9.9; 7.3; 9.8	1-31-86
1190	1.5; 2.3; 3.2; 1.5	1-31-86
1210	2.6; 1.6; 2.6	1-31-86
1230	4.8; 4.0; 4.8	1-31-86
1250	2.8; 2.3; 3.5	1-31-86
1270	2.4; 2.7; 2.6	1-31-86
1290	1.8; 1.0; 2.0	1-31-86

The analyses were done by Kim Lee at the REECo Environmental Laboratory. The hole was drilled to T.D. on 11-17-83.

WBM:krm

cc:
R. Draper
S. Clark

University of California
Lawrence Livermore National Laboratory

Figure 24. CO2 analysis #2 for cuttings samples in U2ez.

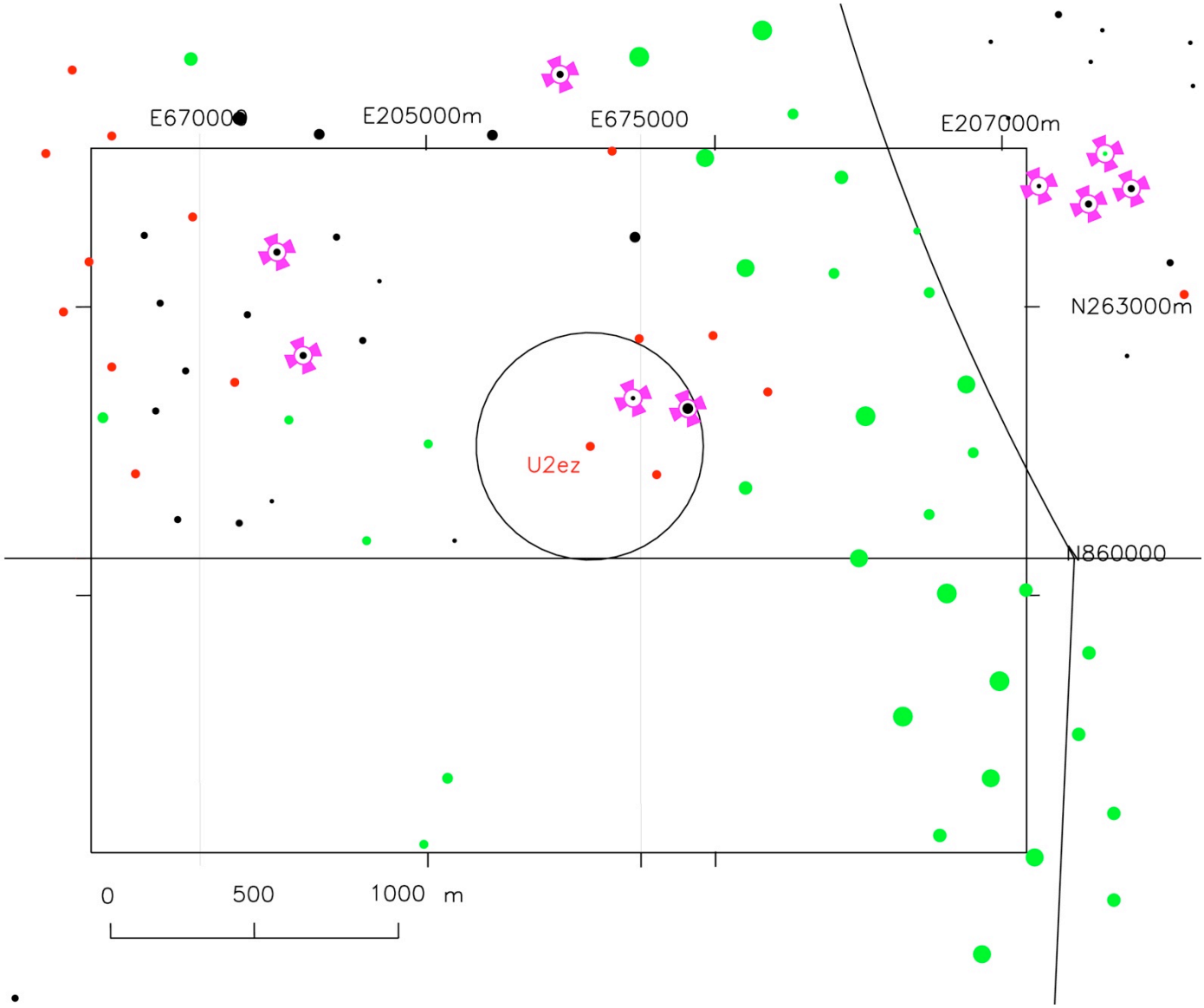

Figure 25. This map shows nearby holes, depth of burial, and release. Purple symbols represent events that released radioactivity to the atmosphere. Black symbols represent events conducted in alluvium. Green symbols represent events conducted in volcanic tuff. Red symbols identify events with similar work point depth and medium to U2ez. The symbol diameter reflects the depth of burial (i.e. the larger the diameter, the deeper the DOB). Four of the events had releases and 2 are located within 1 TD radius. FLASK-Red (U2az-3) and RIOLA (U2eq) are within 1 TD radius of U2ez. FLASK-Red (5/26/70) released radioactivity through cables, while RIOLA (9/25/80) had a surface seep at ground zero.

Table 4
What is this?

Event	Hole	Date	DOB	NAD1927 meters	NAD1927 meters	U2ez meters	unit	Release
Flask	U-2az-3	5/26/70	152	262683	205719	224	QTa	Yes-cable pull
Yannigan	U-2ay-3	2/26/70	364	262418	205801	251	QTa	No
Riola	U-2eq	9/25/80	424	262648	205909	364	QTa	Yes- sgz
Yannigan	U-2ay-2	2/26/70	395	262889	205740	410	QTa	No
Flask	U-2az-1	5/26/70	529	262372	206109	558	Tmr	No
Grove	U-2ds	5/22/74	314	262525	205009	561	Tmr	No
Alviso	U-2du	6/11/75	183	262189	205100	573	QTa	No
Flask	U-2az-2	5/26/70	335	262900	205996	574	QTa	No
Yannigan	U-2ay-1	2/26/70	392	262705	206186	644	QTa	No
Nessel	U-2ep	8/29/79	464	263241	205726	742	QTa	No
Marsilly	U-2el	4/5/77	690	263134	206106	818	Tu1	No
Satz	U-2dq	7/7/78	315	262189	204795	841	Tmr	No
Tyg	U-2dc-3	12/21/68	207	262883	204782	869	QTa	No
Tyg	U-2dc-1	12/21/68	198	263088	204840	927	QTa	No
Lanpher	U-2x	10/18/67	715	262261	206525	988	Tu1	No

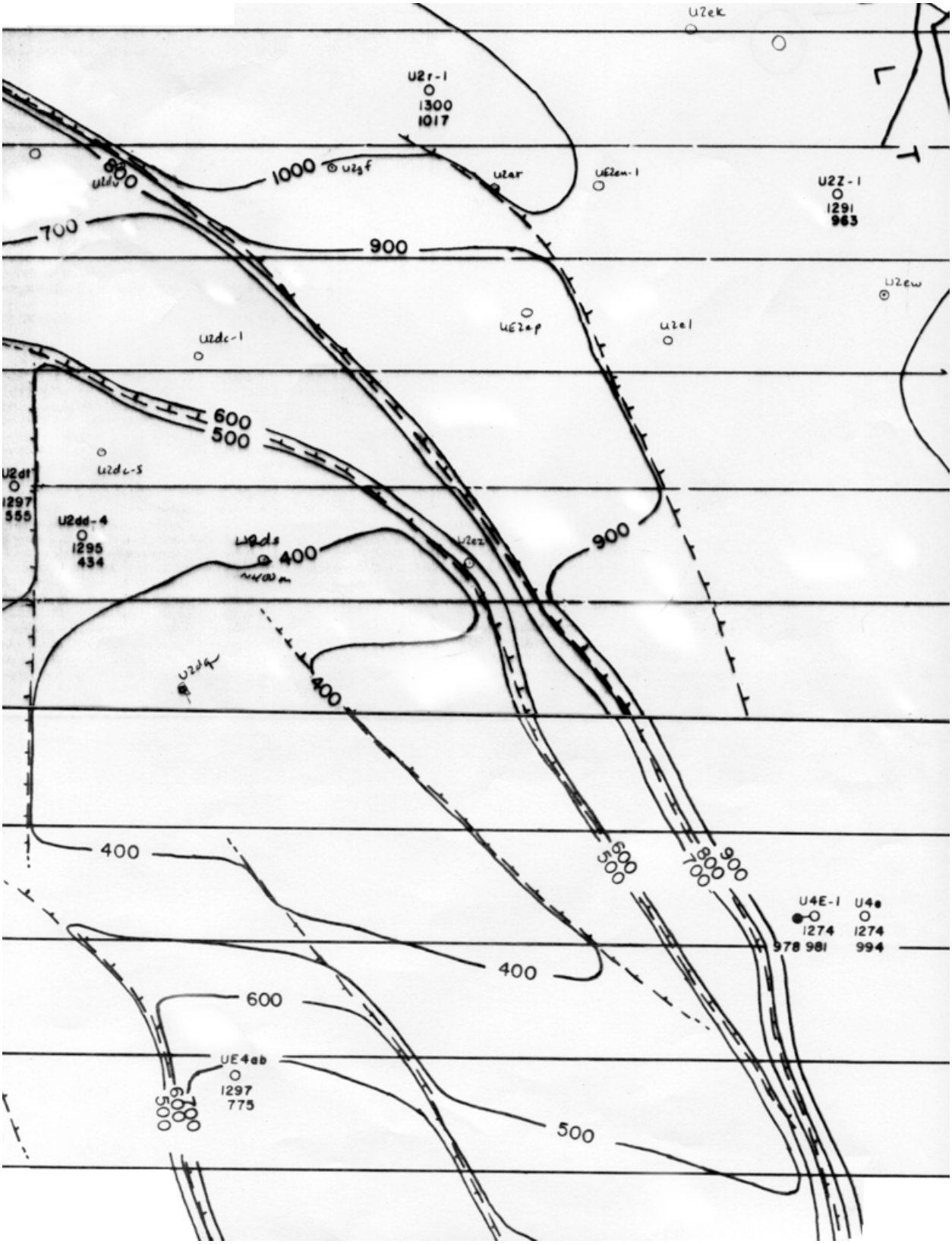

Figure 26. USGS isopach map of the Cenozoic deposits in the Yucca Flat near U2ez (interpreted from surface gravity surveys).

JAN 07 '02 04:52PM BECHTEL NV DRILLING & LOGGING P.2/20

FENIX & SCISSON, INC.

HOLE HISTORY DATA

FILE COPY

DATE: 02-09-84 APPROVED: Jerry Scott Morrison

HOLE NO.: U-2ez	W. O. NO.: 1065-127 * 1065-128		I. D. NO.:
USER: LLNL	TYPE HOLE: Emplacement		
LOCATION NTS	COUNTY: Nye	AREA: 2	
SURFACE COORDINATES: N 861,269.93' - E 674,440.13'			
GROUND ELEVATION: 4217.27'	PAD ELEVATION:	TOP CASING ELEVATION:	
Site Prep. [illegible]: 09-22-83	SPUDDED: 11-08-83	COMPLETED: 11-20-83	
CIRCULATING MEDIA: Dual string- reverse-air and water			
MAIN RIG & CONTRACTOR Calvert #27 - REECo	NO. OF COMPRESSORS & CAPACITY: 1-3/CP-44		

BORE HOLE RECORD			CASING RECORD							
FROM	TO	SIZE	I. D.	WT./FT.	WALL	GRADE	CPL'G.	FROM	TO	CU. FT. CMT.
0'	6.5'	136"	126"			CMP		0'	6.5'	Dirt
6.5'	118'	120"	98"		3/4"			0'	117'	5120
118'	119'	104"								
119'	1300'	96"								

TOTAL DEPTH: 1300' GL AVERAGE MANDREL DEPTH: FROM REFERENCE ELEVATION @

JUNK & PLUGS LEFT IN HOLE:

SURVEYS PAGE: CORING PAGE: CU. FT. CMT. TOTAL IN PLUGS, ETC:

LOGGING DATA: Fluid density, Caliper, Density (2), Epithermal neutron, Electric, **

BOTTOM HOLE COORDINATES: N861,269.52'-E674,440.56' @1250' REFERENCE: H&N Optical, 1-15-84

RIGS USED *(Site Prep Rigs *)*

RIG NO.	NAME	TYPE	CLASS	DAYS OPERATING	SECURED W CREW	SECURED W/O CREW	TOTAL DAYS ON LOC.
85127	Auger #1 *	Williams LL DH-110	VIII	1.40	.06	9.58	11.04
	Auger #2 *	Williams LL DH-120	VIII	1.29	0	2.00	3.29
	Calvert #27	Oilwell 96	1	12.09	0	22.08	34.17

REMARKS: * *Site Prep Items*, 30" x 30' mouse hole pipe in 48" hole w/216 ft3- south side.

** Gamma ray, Vibroseis

PREPARED BY: JEC:st TIME BREAKDOWN ON NEXT PAGE

1 of 6

Figure 27. U2ez hole history (page 1).

U-2ez

TIME BREAKDOWN

SITE PREPARATION

DRILLING OPERATION TIME (DOT)		OTHER SCHEDULED TIME (OST)		OPERATIONAL DELAY TIME (ODT)	
DRILL	1.56	MOVE	.35	RIG REPAIRS	.66
TRIPS		RUN CASING	.25	W. O. DRILLING SUPPLIES	.08
SURVEYS		CEMENT CASING	.44	CLEAN OUT FILL	
				SECURED WITH CREWS	.06
				Ream Dog Legs	.19
SITE DOT 1.56 DAYS		SITE OST 1.04 DAYS		SITE ODT .99	

TOTAL SITE PREP TIME 3.59 DAYS REMARKS:

MAIN HOLE CONSTRUCTION

DRILLING OPERATION TIME (DOT)		OTHER SCHEDULED TIME (OST)		OPERATIONAL DELAY TIME (ODT)	
DRILL	5.94	MOBILIZATION & DEMOBILIZATION	2.48	RIG REPAIRS	.67
TRIPS	.77	CORE		W. O. EQUIPMENT	.12
DRESS DRILLING ASSEMBLY		LOG	.17	FISH	
SINGLE SHOT DEV. SURVEYS		CASED HOLE DIR. SURVEYS		CLEAN OUT FILL	
OPEN HOLE DIRECTION SURVEYS		UNLOAD ~~CASED~~ HOLE	1.40	UNLOAD WATER INFLOW	
Fluid Probe	.06	RUN MANDREL		REAM CROOKED HOLE	
Connections	.48	HYDROLOGICAL TESTS		PLUG BACK	
				DRILL OUT PLUGS	
MAIN HOLE DOT 7.25 DAYS				SECURED WITH CREWS	

CASING OPERATION TIME (COT)			
RUN	CASING		
RUN	CASING		
CEMENT	CASING		
CEMENT	CASING		
DRILL OUT SHOE			
MAIN HOLE COT 0 DAYS		MAIN HOLE OST 4.05 DAYS	MAIN HOLE ODT .79 DAYS

TOTAL MAIN HOLE CONST. TIME 12.09 DAYS REMARKS:

TOTAL ELAPSED TIME

TOTAL SITE PREP TIME	3.59 DAYS	REMARKS:
TOTAL MAIN HOLE CONST. TIME	12.09 DAYS	
SEC. W/O CREW SITE PREP	11.58 DAYS	
[illegible]. W/O CREW MAIN HOLE CONST.	22.08 DAYS	
TOTAL SUSPENDED (NO RIG)	10.83 DAYS	
TOTAL ELAPSED TIME	60.17 DAYS	

2 of 6

Figure 28. U2ez hole history (page 2).

U-2ez
HOLE HISTORY

09-22-83 Moved in Auger #1, rig #85127 and rigged up. Drilled 104" hole from 0' to 14'. Opened 104" hole to 136" from 0' to 6.5'. Set 126" CMP at 6.5' and backfilled the annulus with dirt. Drilled 104" hole from 14' to 26'.

09-23-83 Drilled 104" hole from 26' to 59'.

09-28-83 Rig secured from 09-23-83 to 09-28-83. Worked on rotary drive chain 5 hours. Drilled 104" hole from 59' to 64'.

09-29-83 Rig secured to 1430 hours. Tightened outer kelly lines.

09-30-83 Drilled 104" hole from 64' to 68'. Worked on rotary drive assembly from 1000 hours to 1600 hours.

10-03-83 Rig secured from 09-30-83 to 10-03-83. Rigged down and moved out Auger #1. Moved in Auger #2, rig #85134 and rigged up. Drilled 104" hole from 68' to 80'.

10-04-83 Drilled 104" hole from 80' to 99'. Straightened hole between 78' and 85'.

10-05-83 Drilled 104" hole from 99' to 119'. Opened 104" hole to 120" from 6.5' to 59'.

10-06-83 Opened 104" hole to 120" from 59' to 118'. Rigged down and moved out. Hole suspended.

10-07-83 Hole suspended from 10-06-83 to 0800 hours. Aligned, welded, and set 2 joints of 98" I.D., 3/4" wall casing at 116.95' using a crane. Cemented the annulus using REECo trucks as follows:

Stage No.	Interval	Cement Used-Ft^3	Calc.-Ft^3	CIP
1	118' - 114'	432 Redi-Mix	314	1450 Hours

10-08-83 Filled the casing with water. Cemented the annulus using Halliburton as follows:

2	114' - 103'	400 W-60 Gypsum + 10% sand	270	1330 "
3	103' - 93'	400 W-60 Gypsum + 20% sand	245	1520 "

10-11-83 Cemented the annulus using REECo trucks as follows:

4	93' - 74.5'	864 Redi-Mix	454	0948 "
5	74.5' - 54'	864 "	503	1054 "
6	54' - 34'	864 "	491	1204 "
7	34' - 22'	432 "	294	1248 "
8	22' - 1'	864 "	544	1427 "
	TOTAL	5120 Ft^3	3115 Ft^3	

Hole suspended.

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Figure 29. U2ez hole history (page 3).

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Hole History
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10-12-83 Hole suspended from 10-11-83 to 1230 hours. Moved in Auger #2, rig #85134 and rigged up. Drilled 48" mouse hole on south side of emplacement hole from 0' to 30'. Set 30" mouse hole pipe with plate welded on bottom at 30' and filled pipe with water. Cemented the annulus using REECo truck with 216 ft^3 of Redi-Mix. CIP at 1500 hours. Calculated annular volume was 184 ft^3. Rigged down and moved out. Hole suspended.

10-17-83 Hole suspended from 10-12-83 to 0800 hours, 10-17-83. Construction moved in Calvert #27, rig #85114 and set over hole. Secured rig at 1600 hours.

10-18-83 Rig secured from 10-17-83 to 0800 hours. Moved in equipment. Secured rig at 1600 hours.

11-05-83 Rig secured from 10-18-83 to 1600 hours, 11-05-83. Moved in equipment and secured rig at 1800 hours.

11-07-83 Rig secured from 11-05-83 to 0400 hours, 11-07-83. Started rigging up. Secured rig from 0800 hours to 1600 hours. Continued rigging up.

11-08-83 Rigged up and secured rig from 0800 hours to 1600 hours. Made trip in, cleaned out cement and hole from 115' to 119'. Drilled 96" hole from 119' to 150'. (Drilled 31' in 5-1/2 rotating hours, 24 rpm, 40,000# wt. on bit, 50 psi, dual string drilling with reverse circulation using air and water.)

11-09-83 Drilled 96" hole from 150' to 377'. Repaired plugged blooie line, 4 hours. Checked 149' of fluid in the hole at 325'. (Drilled 227' in 17 rotating hours, 20/35 rpm, 35/40,000# wt. on bit, 100/130 psi, dual string drilling with reverse circulation using air and water.)

11-10-83 Drilled 96" hole from 377' to 602'. Made trip out and secured rig for holiday at 2400 hours. (Drilled 225' in 18 rotating hours, 24/30 rpm, 40/50,000# wt. on bit, 125/140 psi, dual string drilling with reverse circulation using air and water.)

11-12-83 Rig secured from 11-10-83 to 0800 hours, 11-12-83. Checked bit, slipped, and cut drilling line. Made trip in, checked 150' of fluid in the hole, and pumped in water. Drilled 96" hole from 602' to 674'. Checked 157' of fluid at 671'. (Drilled 72' in 9 rotating hours, 24/26 rpm, 45/55,000# wt. on bit, 160 psi, dual string drilling with reverse circulation using air and water.)

11-13-83 Drilled 96" hole from 674' to 815'. Checked 225' of fluid in the hole at 714'. Made trip for bit change at 714'. (Drilled 141' in 16 rotating hours, 20/25 rpm, 40/70,000# wt. on bit, 160/200 psi, dual string drilling with reverse circulation using air and water.)

Figure 30. U2ez hole history (page 4).

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Hole History
Page 3

11-14-83	Drilled 96" hole from 815' to 978'. Checked 256' of fluid in the hole at 844'. (Drilled 163' in 19-1/2 rotating hours, 23/26 rpm, 50/60,000# wt. on bit, 200 psi, dual string drilling with reverse circulation using air and water.)
11-15-83	Drilled 96" hole from 978' to 1124'. Checked 345' of fluid in the hole at 1064'. (Drilled 146' in 21 rotating hours, 20/26 rpm, 45/70,000# wt. on bit, 200 psi, dual string drilling with reverse circulation using air and water.)
11-16-83	Drilled 96" hole from 1124' to 1207'. Checked 350' of fluid in the hole at 1151'. Made trip for bit change at 1205'. (Drilled 83' in 15 rotating hours, 22/25 rpm, 45/60,000# wt. on bit, 200 psi, dual string drilling with reverse circulation using air and water.)
11-17-83	Drilled 96" hole from 1207' to 1300'. Checked 290' of fluid in the hole at 1238'. Started blowing out fluid at 2230 hours. (Drilled 93' in 21 rotating hours, 22/25 rpm, 45/70,000# wt. on bit, 200 psi, dual string drilling with reverse circulation using air and water.)
11-18-83	Continued blowing out fluid.
11-19-83	Blew out fluid to 0800 hours. Laid down drill pipe. Ran Birdwell fluid density log to 1300' T.D., checked fluid level at 1296'. Ran caliper log to 1300' T.D. Laid down drilling assembly and prepared rig to move out.
11-20-83	Moved out equipment and rig. Hole completed 11-20-83.
12-20-83	Ran Birdwell formation density log to 1300' T.D.
12-21-83	Ran epithermal neutron log to 1298' T.D., resistivity log to 1299' T.D., compensated density log to 1299' T.D., gamma ray log to 1300' T.D., and vibroseis survey from 1280' to 100' on 50' stations.

Figure 31. U2ez hole history (page 5).

U-2ez
REVIEW OF HOLE CONDITIONS

3.20 m (126") CMP was set at 2.0 m (6.5') in a 3.45 m (136") hole drilled to 2.0 m (6.5') and the annulus backfilled with dirt. 2.49 m (98") casing was set at 35.7 m (117') in a 3.05 m (120") hole drilled to 36.0 m (118'). The annulus was cemented to 34.7 m (114') with 12.23 m^3 (432 ft^3) of Redi-Mix, to 31.4 m (103') with 11.33 m^3 (400 ft^3) of W-60 gypsum + 10% sand, to 28.3 m (93') with 11.33 m^3 (400 ft^3) of W-60 gypsum + 20% sand, and to 0.3 m (1') in 5 stages with 110.10 m^3 (3888 ft^3) of Redi-Mix. Total volume used in 8 stages was 144.98 m^3 (5120 ft^3), 10-11-83. Calculated annular volume was 88.21 m^3 (3115 ft^3). 2.44 m (96") hole was drilled to a total depth of 396.2 m (1300') using the dual string reverse air and water circulating method. The hole was dewatered. Fluid density and caliper logs were run 11-19-83. Fluid density log run to 396.2 m (1300') T.D. indicated fluid level at 395.0 m (1296'). The average curve on caliper log #1 indicated a near gauge hole. Hole completed 11-20-83. Formation density, epithermal neutron, electric, compensated density, gamma ray logs, and vibroseis survey from 390.1 m (1280') to 30.5 m (100') on 15.2 m (50') stations were run 12-20-83 and 12-21-83.

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Figure 32. U2ez hole history (page 6).

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The following images were taken using the LLNL downhole color drone camera in U2ez on November 16, 1988.

Figure 33. U2ez 275.2' depth, 077° azimuth.

Figure 34. U2ez 303.6’ depth, 062º azimuth.

Figure 35. U2ez 303.6' depth, 129° azimuth.

Figure 36. U2ez 303.6' depth, 150° azimuth.

Figure 37. U2ez 403.6’ depth, 109° azimuth.

Figure 38. U2ez 463.7' depth, 078° azimuth.

Figure 39. U2ez 463.7' depth, 123° azimuth.

Figure 40. U2ez 463.7' depth, 164° azimuth.

Figure 41. U2ez 522.6’ depth, 130º azimuth.

Figure 42. U2ez 721.7' depth, 253° azimuth.

Figure 43. U2ez 882.8' depth, 187° azimuth.

Figure 44. U2ez 964.2’ depth, 007° azimuth.

Figure 45. U2ez 984.2’ depth, 000º azimuth.

Figure 46. U2ez 984.7' depth, 000° azimuth.

Figure 47. U2ez 1068.5' depth, 328° azimuth.

Figure 48. U2ez 1070.1' depth, 341° azimuth.

Figure 49. U2ez 1087.9' depth, 316° azimuth.

Figure 50. U2ez 1087.9' depth, 338º azimuth.

Figure 51. U2ez 1175.6' depth, 009° azimuth.

Figure 52. U2ez 1176.1' depth, 010° azimuth.

Figure 53. U2ez 1177.0’ depth, 009º azimuth.

Figure 54. U2ez 1177.7' depth, 010° azimuth.

Figure 55. U2ez 1178.7' depth, 008° azimuth.

Figure 56. U2ez 1179.2' depth, 009º azimuth.

Figure 57. U2ez 1179.6' depth, 013º azimuth.

Figure 58. U2ez 1179.9' depth, 014° azimuth.