



NNWSI HOLE HISTORIES

USW UZ-1
UE-25 UZ #4
UE-25 UZ #5
USW UZ-6
USW UZ-6s
USW UZ-7
USW UZ-8
USW UZ-13

APRIL, 1987

HYDROLOGY DOCUMENT NUMBER 274

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UE-25 UZ #4

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USW UZ-7

USW UZ-8

USW UZ-13

BY

FENIX & SCISSON, INC.

**PREPARED FOR
U. S. DEPARTMENT OF ENERGY
NEVADA OPERATIONS OFFICE
UNDER CONTRACT DE-AC08-84NV10322**

APRIL, 1987

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USW UZ-8
USW UZ-13**

by

Reports and CEP Section

Abstract

This report is a compilation of data from eight exploratory boreholes drilled to help characterize the geology and hydrology of the unsaturated zone. The eight holes were drilled between April, 1983 and April, 1986 under the guidance of the U.S. Geological Survey in Area 25 of the Nevada Test Site and in Bureau of Land Management land adjacent to the Nevada Test Site. Data presented in the hole histories include all locations, daily activities, review of hole conditions, geophysical log lists and microfiche copies of the geophysical logs run by the Fenix & Scisson, Inc. subcontractors.

FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI

Approved: Jerry Full Covington
 Date: May 1, 1987

Hole No.: USW UZ-1		Type Hole: Unsaturated Zone Test Hole	
User: USGS	Area: Off Site	Site Prep. W.O. #: None	
Location: NTS	County: Nye	W.O. #: 3404-154	
Surface Coordinates: N 771,275.82' E 560,220.80'			
Ground Elev.:		Pad Elev.:	Top Casing Elev.: 4426.24'
Bottom Hole Coord: Not Surveyed		@	Ref:
Rig On Location:		Spudded: 04-27-83	Completed: 07-31-83
Circulating Media: Dual string - reverse - vacuum		Instrumented: 10-24-83	
Main Rig & Contractor: Ideco 525 - REECO			
No. Of Compressors & Capacity: 1/IR 315, 1-2/Atlas 1200, 1/IR 600			
Bore Hole Record		Casing Record	
From	To	Size	I.D.
0'	41.5'	48"	41"
41.5'	97'	36"	
97'	101'	24"	
101'	1265'	17-1/2"	
1265'	1269'	15"	
1269'	1270'	9-1/4"	
			Wt/Ft.
			Wall
			From
			To
			Ft ³ Cement
			0'
			39.5'
			432
			*
Total Depth: 1270'		Plugs: Cemented from fish at 1243' to 1221' with 35 ft ³	
Junk: Globe basket and crossover sub, top at 1243'			
Logging Data: Fluid density (5), Caliper (2), Electric, Density (2), Gamma ray-epithermal neutron, Dielectric, Gamma ray-spectrum, Casing collar locator (4), Water locator (169)			

**Rigs
Used**

Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location
85134	Auger #2	VIII				1.44
85124	Ideco 525	II				95.23

Remarks: * 15" and 17-1/2" hole was cemented from fill at 1268' to 1221' with 75 ft³ of W-60 gypsum, then 17-1/2" hole was redrilled to 1239', and 15" hole to 1255', 07-26-83. Hole was then cemented from fish at 1243' to 1221' with 35 ft³ of neat + CaCl₂. Total Ft³ cement in plugs: 110 ft³

Prepared By: JRG:JEC:LLF:ps

Time Breakdown on Next Page

TIME BREAKDOWN

MAIN HOLE CONSTRUCTION

Hole No.: USW UZ-1

Drilling Operation Time (DOT)		Other Scheduled Time (OST)		Operational Delay Time (ODT)	
Drill	18.92	Mobe & Demobe	11.41	Rig Repairs	2.44
Trips	5.69	Core	1.90	W.O. Equipment	0.60
Dress Drilling		Log	1.21	Fish	1.16
Assembly		Unload Hole		Clean Out Fill	2.69
Fluid Probe		Run Mandrel		Ream Hole	
Connections		Hydrological		Plug Back	0.65
Open Hole Dir.		Tests		Drill Out Plugs	
Surveys	0.35	Core Trips	2.98	Secured W/Crews	0.13
Lay Down Drill Pipe	0.35	Sandia Seismic		Unload Water	
		Monitor	0.04	Inflow	5.96
Main Hole DOT	25.31 Days	Run TV Camera	0.21	Drill/Core Out	
				Plugs	4.79
				Bail/Unload Drlg.	
				Fluid	0.73
				Unplug Vacuum	
				System	1.84
				Fluid Depth Check	0.79
				Wait On Orders	0.10

Main Hole COT: 1.04 Days Main Hole OST: 17.75 Days Main Hole ODT: 21.88 Days

Total Main Hole Construction Time: 65.98 Days

Remarks:

TOTAL ELAPSED TIME

Total Site Prep. Time		Days	Remarks: Time breakdown from 0800 hours, 04-26-83 through 07-31-83.
Total Main Hole Construction	65.98	Days	
Secured W/O Crew Site Prep.		Days	
Secured W/O Crew Main Hole Const.	4.67	Days	
Total Suspended Time (No Rig)	26.02	Days	
TOTAL ELAPSED TIME	96.67	Days	

USW UZ-1
HOLE HISTORY

- 04-26-83 Moved in Auger #2, rig #85134 and rigged up.
- 04-27-83 Drilled 48" hole from 0' to 41.5'. Rigged down and moved out. Hole suspended.
- 05-12-83 Hole suspended from 04-27-83 to 05-12-83. Ran and set 41.07' of 42" O.D., 1/2" wall casing at 39.5' using a crane. Stemmed the hole to 36' with sand. Hole suspended at 1200 hours.
- 05-13-83 Hole suspended from 05-12-83 to 1100 hours. Cemented the annulus using REECO Redi-Mix truck as follows:

<u>Stage No.</u>	<u>Interval</u>	<u>Cement Used Ft³</u>	<u>Calc. Ft³</u>	<u>CIP</u>
1	41.5' - 18'	216 Redi-Mix (7 sk. mix)	55	1130 Hours
05-16-83	2 18' - 3'	216 Redi-Mix (7 sk. mix)	37	1100 Hours
TOTALS		432 Ft ³	92 Ft ³	

Hole suspended.

- 05-19-83 Hole suspended from 05-16-83 to 05-19-83. Moved in Auger #2, rig #85134 and rigged up. Drilled 26" mouse hole to 18' and set 16" mouse hole pipe at 18'. Rigged down and moved out. Hole suspended.
- 05-24-83 Hole suspended from 05-19-83 to 05-24-83. Moved in Ideco 525, rig #85124 and equipment. Started rigging up.
- 05-25-83 Continued rigging up.
- 05-26-83 Continued rigging up.
- 05-27-83 Continued rigging up. Started rigging up vacuum equipment for vacuum drilling.
- 05-28-83 Continued rigging up vacuum drilling equipment.
- 05-29-83 Continued rigging up vacuum drilling equipment. Secured rig at 2400 hours.
- 05-31-83 Rig secured from 05-29-83 to 0800 hours, 05-31-83. Continued rigging up. Made up 36" bit and bottom hole assembly.
- 06-01-83 Rigged up vacuum drilling equipment. Worked on circulating equipment. Made trip in with 36" bit on 8-5/8" and 5-1/2" dual

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Hole History
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- 06-01-83
(Cont.) string drill pipe. Cleaned out cement and fill from 39.5' to 41.5'. Drilled 36" hole from 41.5' to 44' with dual string reverse vacuum circulation using LiBr water. Tools stopped drilling. Started working on circulating equipment.
- 06-02-83 Worked on vacuum equipment to 0600 hours. Drilled 36" hole from 44' to 55'. Made trip for 14-3/8" O.D. Globe basket for coring. Cleaned out 2' fill and cut core #1 from 55' to 56'. Made trip out, no core recovery. Tagged fluid level at 35.8' and fill at 49.8'. Bailed out fluid to 44' using 13-3/8" x 21' suction bailer on a sand line.
- 06-03-83 Made trip in with 36" bit, unable to unload fluid. Opened 14-3/8" hole to 36" from 55' to 56'. Made trip to unplug inner vacuum string. Drilled 36" hole from 56' to 58' with no returns. Made trip out to unplug surface vacuum connections, dropped 1-1/2" O.D. x 6" pin in the hole. Made trip with diaphragm pump and pumped out 9 barrels of mud. Fished out pin using a magnet and checked fluid level at 48.5'. Secured rig at 2400 hours.
- 06-05-86 Rig secured from 06-03-83 to 0800 hours, 06-05-83. Made trip in and cleaned out fill from 49' to 52'. Inner string kept plugging up. Dried out hole using 2 Atlas 1200 compressors. Cleaned out fill from 47' to 49' using a Gardner Denver vacuum pump.
- 06-06-83 Cleaned out fill from 49' to 58'. Cleaned bit and mandrel several times, damp cuttings. Drilled 36" hole from 58' to 59' using the dual string reverse vacuum circulating method. Made trip for bit jets. Drilled 36" hole from 59' to 64'. Made trip to change mill tooth cutters to button cutters and worked on vacuum system.
- 06-07-83 Cleaned out fill from 63' to 64', 8 hours due to damp fill. Drilled 36" hole from 64' to 72'. Made trip for 13-3/8" O.D. Bowen Itco junk basket for coring. Started 13-3/8" core #2 from 72' to 74'.
- 06-08-83 Completed 13-3/8" core #2 from 74' to 79'. Made trip out, recovered 2' core. Made trip in with 36" bit, cleaned out 1' fill and opened 13-3/8" hole to 36" from 72' to 77', vacuum system kept plugging up. Blew hole dry using 2 Atlas 1200 compressors.
- 06-09-83 Opened 13-3/8" hole to 36" from 77' to 79'. Secured rig from 0830 hours to 1030 hours. Made trip to unplug discharge system. Drilled 36" hole from 79' to 80' and unplugged system. Drilled 36" hole to 83' and unplugged discharge system. Tagged fill at 81' and started cleaning out fill, unplugged discharge system.
- 06-10-83 Cleaned out fill to 83', vacuum system continued plugging up. Made trip to change bit cutters and added 1/4" jets in bit. Drilled 36" hole from 83' to 84'. Cleaned plugged bit at 83.5'.

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Hole History
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- 06-11-83 Drilled 36" hole from 84' to 89'. Bit and vacuum system continued plugging up. On last trip to unplug inner string, started cleaning out fill from 88'.
- 06-12-83 Unplugged 4" vacuum hose and cleaned out fill to 89'. Drilled 36" hole from 89' to 90', continued unplugging vacuum system. Cleaned and worked on vacuum equipment.
- 06-13-83 Cleaned out hole to 90', unplugged bit 3 times. Made trip out to clean and dress bit. Ran USGS depth and water check. Made trip in and drilled 36" hole from 90' to 97'. Took USGS sample at 92'. Made trip out for 22" Globe basket for core #3. Raised dry cyclone 2'.
- 06-14-83 Made trip in with 22" Globe basket with 24" core shoe on 8-5/8" x 5-1/2" drill pipe. Cut 24" core #3 from 97' to 101'. Made trip out, recovered 2' of core. Made trip in with 17-1/2" bit, reamer and drill collars on dual string drill pipe. Blew hole dry and cleaned out 3' fill. Drilled 17-1/2" hole from 101' to 108' using dual string reverse vacuum method with 7" of vacuum.
- 06-15-83 Drilled 17-1/2" hole from 108' to 170' with 9" vacuum. Unplugged dry cyclone system at 115'. Made trip for 9-1/8" x 7-1/2" Globe basket (basket holds 2' core). Cut 9-1/8" cores #4, #5 and #6 from 170' to 176', recovered 4.4' of core. Made trip in with 17-1/2" bit. Installed vibrator on dry cyclone.
- 06-16-83 Opened 9-1/8" hole to 17-1/2" from 170' to 176'. Drilled 17-1/2" hole from 176' to 220' with 11" vacuum. Unplugged vacuum system at 185'. Made trip out for Globe basket. Changed orders and made trip in. Drilled 17-1/2" hole from 220' to 249' with 10" to 12" vacuum. Made trip for fabricated 11" O.D. x 1/2" wall casing core sampler. Attempted to cut 11" core #7 from 249' to 249.5'. Made trip out, no recovery. Made trip in with 13" x 10-3/4" Globe basket with 14" core shoe.
- 06-17-83 Cut 14" core #8 from 249.5' to 251'. Made trip out, recovered 1.75' core. Made trip in and opened 14" hole to 17-1/2" from 249' to 251'. Drilled 17-1/2" hole to 336' with 11" to 12" vacuum.
- 06-18-83 Drilled 17-1/2" hole from 336' to 350'. Made trip for 14" O.D. Globe basket. Cut 14" core #9 from 350' to 352'. Made trip out, recovered 1.2' core. Cleaned wet cyclone. Made trip in with 17-1/2" bit and cleaned out 1' fill. Opened 14" hole to 17-1/2" from 350' to 352' and drilled 17-1/2" hole to 382'.
- 06-19-83 Drilled 17-1/2" hole from 382' to 491' with 28/35 rpm, 5/10,000# wt. on bit and 12" to 13" vacuum.

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- 06-20-83 Drilled 17-1/2" hole from 491' to 500'. Made trip for 14-3/4" x 11-3/4" Globe basket. Cut 14-3/4" core #10 from 500' to 502'. Made trip out, recovered 0.5' core. Made trip in, opened 14-3/4" hole to 17-1/2" from 500' to 502' and drilled 17-1/2" hole to 522' with 18/35 rpm, 3/10,000# wt. on bit and 12" vacuum.
- 06-21-83 Drilled 17-1/2" hole from 522' to 534' with 15/20 rpm, 3/10,000# wt. on bit and 12" vacuum. Made trip out for bit change. Cleaned wet cyclone and repaired dry cyclone. Made trip in and reamed hole from 531' to 534'.
- 06-22-83 Drilled 17-1/2" hole from 534' to 647' with 15/30 rpm, 5/15,000# wt. on bit and 12" to 13" vacuum.
- 06-23-83 Made trip to free bit cutters. Drilled 17-1/2" hole from 647' to 685' with 12/20 rpm, 5/25,000# wt. on bit and 12" vacuum.
- 06-24-83 Drilled 17-1/2" hole from 685' to 733' with 15 rpm, 15/20,000# wt. on bit and 12" vacuum. Made trip to service bit at 730' and took deviation survey.
- 06-25-83 Drilled 17-1/2" hole from 733' to 795' with 12/15 rpm, 20/25,000# wt. on bit, and 12" to 13" vacuum.
- 06-26-83 Made trip for bit check. Drilled 17-1/2" hole from 795' to 851' with 15 rpm, 15/20,000# wt. on bit and 12" vacuum. Cleaned out water tank for wet cyclone.
- 06-27-83 Drilled 17-1/2" hole from 851' to 923' with 15/20 rpm, 15/20,000# wt. on bit and 12" vacuum. Made trip for bit check at 875'.
- 06-28-83 Made trip for bit change. Drilled 17-1/2" hole from 923' to 950' with 15/20 rpm, 3/15,000# wt. on bit and 12" vacuum. Made trip for bit change at 935', and reamed and cleaned out hole from 860' to 935'.
- 06-29-83 Drilled 17-1/2" hole from 950' to 1000' with 5/20 rpm, 10/15,000# wt. on bit and 12" vacuum. Made trip for Kore-King core barrel and 8-1/2" x 4" core bit. Cut 8-1/2" core #11 from 1000' to 1010' with conventional circulation using air. Made trip out, 5' core recovery.
- 06-30-83 Opened 8-1/2" hole to 17-1/2" from 1000' to 1010' and drilled 17-1/2" hole to 1057' with 15 rpm, 15/20,000# wt. on bit and 12" vacuum.
- 07-01-83 Drilled 17-1/2" hole from 1057' to 1113' with 15/20 rpm, 15/20,000# wt. on bit and 12" to 13" vacuum. Made trip for bit check and dressed stabilizer at 1083'.

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- 07-02-83 Drilled 17-1/2" hole from 1113' to 1165' with 15/20 rpm, 15/20,000# wt. on bit and 12" vacuum. Made trip for bit change at 1160'.
- 07-03-83 Drilled 17-1/2" hole from 1165' to 1210' with 15/20 rpm, 15/20,000# wt. on bit and 12" vacuum. Made trip for bit change and dressed reamer at 1166'. Made trip out, dressed bit and reamer and secured rig for holiday at 2400 hours.
- 07-05-83 Rig secured from 07-03-83 to 0800 hours, 07-05-83. Made trip in. Drilled 17-1/2" hole from 1210' to 1241' with 15/20 rpm, 15/20,000# wt. on bit and 12" vacuum.
- 07-06-83 Drilled 17-1/2" hole from 1241' to 1258' with 15/20 rpm, 15/20,000# wt. on bit and 12" to 14" vacuum. Made trip for bit change, dressed reamer and cleaned out 8" fill at 1257'. Made trip out checking tool joints for leaking seals. Ran USGS fluid probe, checked fluid level at 1249'.
- 07-07-83 Ran Birdwell fluid density log to 1254' T.D., checked fluid level at 1253'. Reran fluid density log, no change. Ran caliper log to 1255' T.D. Ran hydrologic tests using Birdwell fluid density tool, 3- 1/2" O.D. and 6-5/8" O.D. bailers and USGS fluid probe from 1030 hours.
- 07-08-83 Ran hydrologic tests using suction bailer on a sand line to 1000 hours. Made trip in with 17-1/2" bit on 8-5/8" x 5-1/2" dual string drill pipe. Cleaned out 17-1/2" hole from fill at 1254.5' to 1258' with 15/20 rpm using 13" vacuum. Checked for fill and cleaned out 1' fill.
- 07-09-83 Checked for fill for 15 minutes and cleaned out 2' fill. Rechecked for fill, no fill. Made trip out and unplugged inner string and bit. Ran USGS water probe, checked 4' of fluid in the hole at 0800 hours and 5' of fluid at 0930 hours. Made trip in with 9-1/4" x 7-3/4" x 2.5' Globe basket, no fill. Cut 9-1/4" core #12 from 1258' to 1260'. Made trip out, recovered 2' core. Rigged up to run 9-5/8" casing and 1.9" tubing.
- 07-10-83 Slotted bottom 10' of first joints of 9-5/8" casing and 1.9" tubing. Orange peeled bottom of 1.9" monitor line and tack welded line on outside of the casing. Ran and landed casing at 1257' with monitor line at 1257'. Attempted to run USGS transducer down the monitor line, instrument stopped at 1125'. Checked fluid level inside the casing at 1249.5'. Ran 1-3/8" x 10' sinker bar down monitor line to tight spot at 942'.
- 07-11-83 Worked sinker bar in the tubing, unable to swedge tubing out enough for transducer. Made up and ran 1" O.D. x 2" long transducer down monitor line to 1257', checked fluid level at 1250'. Ran

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- 07-11-83 hydrologic tests using a 6-5/8" bailer from 0900 hours to 2100 (Cont.) hours. Laid down 9-5/8" casing and 1.9" monitor line.
- 07-12-83 Laid down 8-5/8" x 5-1/2" drill pipe and drilling assembly. Ran USGS fluid probe, checked fluid level at 1255'. Cleaned drill pipe, drilling assembly and made trip measuring in. Worked on dry cyclone. Dewatered hole from 1254' to 1257'. Started cleaning out fill from 1257' using dual string reverse vacuum system.
- 07-13-83 Cleaned out fill to 1258'. Opened 9-1/4" hole to 17-1/2" from 1258' to 1260' and drilled 17-1/2" hole to 1262' with 20 rpm, 2/15,000# wt. on bit and 15" vacuum. Had problems keeping vacuum system clear and kept cleaning out fill.
- 07-14-83 Made trip to unplug bit. Ran USGS transducer, checked fluid level at 1257'. Cleaned out fluid and hole to 1262'. Drilled 17-1/2" hole from 1262' to 1264' with vacuum shut off. Checked for fill, 2' fill. Made trip out. USGS checked fluid level at 1257.42'. Made trip in, cut 14-3/4" core #13 from 1264' to 1267'. Made trip out, no core recovery. USGS checked fluid level at 1254.6'. Started running 6-5/8" O.D. bailer.
- 07-15-83 Ran bailer tests and monitored fluid level to 1200 hours. Made trip in with 14-3/4" x 11-3/4" x 3.5' Globe basket and cleaned out fill from 1260' to 1267'. Worked basket free and made trip out. Changed to 12' Globe basket and made trip in. Cleaned out soft fill from 1264' to 1267'. Cut 14-3/4" core #14 from 1267' to 1268'.
- 07-16-83 Made trip out, no core recovery. USGS transducer indicated fluid level at 1254.7'. Made trip in with 9-1/4" Globe junk basket. Cleaned out fill from 1265' to 1268' for core #15 with 15 rpm, 3/5,000# wt. on tools and 15" vacuum. Made trip out, recovered 1.9' core and 50 gallons of water. Made trip in with Globe junk basket, cut 9-1/4" core #16 from fill at 1266.5' to 1268' and new hole to 1270' with 15/20 rpm, 3/5,000# wt. on tools and 15" vacuum. Made trip out, recovered 2' core and 30 gallons of water. USGS transducer indicated fluid level at 1254.9'. Made trip in with 17-1/2" bit, cleaned and dewatered hole from 1254' to 1260' with 17.5" vacuum.
- 07-17-83 Dewatered hole to 1264'. Opened 14-3/4" hole to 17-1/2" from 1264' to 1265' with 15 rpm, 2,000# wt. on bit and 15" vacuum. Vacuum went to 20" at 1265', pulled tools up to 1260' and vacuum went back to 15". Worked on equipment 6 hours. Made trip out. USGS checked fluid level at 1255' and fill at 1264.5'.
- 07-18-83 Made trip in with 15" Globe basket to fill at 1263'. Cleaned out fill and 14-3/4" hole to 15" from 1263' to 1268'. Made trip out, recovered 6" of fill. USGS monitored fluid level at 1256'. Made

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- 07-18-83
(Cont.) trip in with 15" Globe basket to fill at 1265'. Cleaned out fill to 1267', reamed tight hole to 1268', and opened 9-1/4" hole to 15" to 1269'. Made trip out, no fill recovery. Made trip in with 17-1/2" bit and started dewatering hole. Started repairing blower clutch at 2000 hours.
- 07-19-83 Repaired blower clutch to 0600 hours. Dewatered hole using 15.5" vacuum to 1100 hours and made trip out. Ran Birdwell fluid density log to 1262' T.D., checked fluid level at 1253'. Ran caliper log to 1262' T.D., electric log to 1263' T.D., compensated density log to 1263' T.D., and gamma ray-epithermal neutron log to 1263' T.D.
- 07-20-83 Ran density log to 1263' T.D. Ran Dresser Atlas dielectric and gamma-ray spectrum logs to 1263' T.D. Made 2 runs with 13-3/8" suction bailer, bailer sanded up. Made 2 runs with 7-5/8" bailer, bailer sanded up. Ran Westech TV camera, fluid indicated at 1257'. Made 7 runs with 7-5/8" bailer. Ran TV camera, fluid indicated at 1259'. Made 2 runs with 13-3/8" suction bailer, bailer sanded up.
- 07-21-83 Made 8 runs with 7-5/8" bailer. Ran Westech TV camera, fluid indicated at 1264'. Made 1 run with 6-5/8" bailer for water samples. Made trip in with 2-7/8" tubing and tagged fill at 1268'. Cemented the hole using Halliburton with 75 ft³ of W-60 gypsum cement. CIP at 0540 hours. Calculated hole volume was 77 ft³. Made trip out. Tagged top of cement at 1221'. Ran USGS fluid probe, checked fluid level at 1199'. Made 3 runs with 7-5/8" bailer, bailer sanded up. Made 14 runs with 10-3/4" bailer. After 10th run, checked fluid level at 1211' with USGS fluid probe. Attempted to run suction bailer.
- 07-22-83 Ran suction bailer, recovered contaminated cement. Made trip in with 15" x 12' Globe basket on 8-5/8" x 5-1/2" drill pipe and cleaned out 2' fill to cement at 1226'. Cut 15" cement core from 1226' to 1228'. Made trip out, recovered 2' of cement. Made trip in with 17-1/2" bit and cleaned out hole from 1221' to 1226'. Opened 15" hole to 17-1/2" to 1228' and drilled out cement to 1230' with 20 rpm, 2/3,000# wt. on bit using 17" vacuum. Made trip out and unplugged vacuum system. Made trip in with 15" x 12' Globe basket. Cut 15" cement core from 1230' to 1232'. Basket jammed and made trip out, recovered 2' of hard cement and 3' of wet cement.
- 07-23-83 Cleaned tools and made trip in with Globe basket. Cut 15" cement core from 1232' to 1233'. Made trip to unplug tools, recovered 1' of hard damp cement. Cut 15" cement core from 1233' to 1234'. Made trip, recovered 1' of hard and 1' of wet cement. Cut 15" cement core from 1234' to 1235.5'. Made trip, recovered 1' hard and 1' of wet cement. Cut 15" cement core from 1235.5' to 1237'. Made trip for 17-1/2" bit, recovered 1' of hard cement with water on top of core. Opened 15" hole to 17-1/2" from 1230' to 1237'.

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- 07-24-83 Cleaned out cement cuttings from 1230' to 1237' and drilled out cement to 1238' using vacuum. Made trip to unplug tools. Cleaned out 2' fill and started drilling out cement from 1238'.
- 07-25-83 Made trip to unplug 17-1/2" bit and inner string. Cleaned out 1.5' of fill and drilled out cement from 1238' to 1239' using 315 psi air and 15" vacuum. Made trip out to unplug tools. Made trip in with 15" Globe basket and cleaned out 1' fill. Cut 15" cement core from 1239' to 1243'.
- 07-26-83 Cut 15" cement core from 1243' to 1244'. Made trip for long tooth shoe, recovered 2' damp core. Cleaned out 2' fill and cut 15" cement core from 1244' to 1251'. Made trip out, recovered 6' hard core, 3' soft core and 1' mushy core. Removed 17-1/2" roller reamer above Globe basket and made trip in. Cut 15" cement core from 1251' to 1255', tools stuck on bottom. Worked stuck pipe, rotary clutch went out. Repaired clutch and started running 1.9" tubing down hole outside the drill pipe.
- 07-27-83 Landed tubing at 1224' and spot dumped 14 gallons of LiBr water and 1 gallon of polymer. Worked stuck tools 8-1/2 hours with no movement, burnt out rotary clutch. Laid down 1.9" tubing. Ran Birdwell casing collar log down inner string to 1250' T.D. Pumped 100 gallons of LiBr water down inner string. Ran fluid density log, checked fluid level at 1196'. After 10 minutes reran fluid density log, checked same fluid level. Pumped 50 gallons of LiBr water down inner string. Ran Birdwell 6', 6,000 grain string shot to 1243', center of string shot. On third attempt to back torque drill pipe, shot string shot and backed off pipe. Started out of the hole laying down drill pipe measuring out.
- 07-28-83 Laid down 8-5/8" x 5-1/2" drill pipe. Left 13.83' Globe basket and crossover sub in the hole, top of fish at 1241.17'. Made trip in with 1.9" tubing, bottom joint was orange peeled and slotted. Tagged fish at 1243'. Cemented the hole using Halliburton with 1 barrel of water ahead of 35 ft³ of neat cement + 2% CaCl₂. Displaced cement in tubing with wiper plug ahead of 1 barrel of water. CIP at 1145 hours. Calculated hole volume was 40 ft³. Laid down tubing and started rigging down. Tagged top of cement at 1221'. Made 2 runs with 10" I.D. bailer. Made 5 runs with suction bailer. Made 1 run each with suction and 10" bailers, no fluid recovery. Welded steel plate over 42" casing.
- 07-29-83 Started rigging down.
- 07-30-83 Continued rigging down.
- 07-31-83 Rigged down and moved out. Hole completed 07-31-83.
- 08-09-83 Moved out equipment and cleaned location.

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Hole History
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- 09-15-83 Attempted to dump 1 sack of Cal-Seal and 100# of #47 foundry sand using Birdwell dump bailer at bottom of hole, material packed off in bailer. Mixed 1 sack of chemical compound and 200# of 8-18 mesh sand in bailer and dumped material at 1210'.
- 09-16-83 Moved in stemming material and equipment. Prepared color coded 2-3/8" fiberglass instrument tubing.
- 9-19-83 Started in the hole with 3-1/2" O.D., 5.73# HCQ rods using a crane.
- 09-20-83 Lowered and landed first string of HCQ rods at 1206'. Ran and landed second string of HCQ rods at 1166'. Ran TV camera to 859', rods interfered with camera run.
- 09-21-83 Operation secured to 1100 hours. Tagged bottom at 1219' using Halliburton wire line, no fluid indicated. Laid out 2-3/8" O.D. fiberglass tubing for instrumentation. Fabricated a centralizing guide for bottom of tubing.
- 09-22-83 Waited for downhole instrument certification.
- 09-23-83 Waited for downhole instrument certification.
- 09-26-83 Waited on orders. Continued preparation for instrumentation.
- 09-27-83 Continued preparation for instrumentation.
- 09-28-83 Rigged up. Started in the hole with psychrometer, transducer, instruments, and cables attached on the outside (as directed) of 2-3/8" O.D., 1030#/1000' reinforced thermosetting resin pipe (RTRP/fiberglass).
- 09-29-83 Lowered 2-3/8" fiberglass pipe and attached instruments spaced as directed to 855.49'.
- 09-30-83 Lowered 2-3/8" fiberglass pipe and attached instruments to 1094.06'.
- 10-03-83 Operation secured from 09-30-83 to 10-03-83. Lowered 2-3/8" fiberglass pipe and attached instruments down hole. Ran Birdwell water locator log to fill at 1217.5', no fluid indicated. Landed fiberglass pipe at 1213.35'. Ran Birdwell collar locator and water locator logs to locate instruments. Rigged up to stem the annulus.
- 10-04-83 Rigged up stemming and grouting equipment.
- 10-05-83 Inspected instrumentation. Stemmed and grouted the annulus thru 1 dry string and 1 wet string of HCQ rods using mono pump and Birdwell monitor logs as follows:

USW UZ-1
Hole History
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10-05-83 (Cont.)	Stage No.	Interval Ft.	Material Used Ft ³	CIP Hrs.
	1	1217.5 - 1184	Stemming*	
	2	1184 - 1174	19.32 Grout**	1550
10-06-83	3	1174 - 1145	Stemming	
	4	1145 - 1135	19.32 Grout	1208
10-07-83	5	1135 - 1065	Stemming	
	6	1065 - 1056	17.00 Grout	1356
	7	1056 - 1040	Stemming	
10-10-83	"	1040 - 1037	Stemming	
	8	1037 - 1027	24.00 Grout	1100
	9	1027 - 971	Stemming	
	10	971 - 965	17.00 Grout	1440
10-11-83	"	965 - 959	10.00 Grout	0900
	11	959 - 940	Stemming	
	12	940 - 932	17.00 Grout	0940
	13	932 - 902	Stemming	
	14	902 - 895	17.00 Grout	1352
	15	895 - 880	Stemming	
10-12-83	"	880 - 844	Stemming	
	16	844 - 836	14.00 Grout	1030
	17	836 - 815	Stemming	
	18	815 - 805	10.84 Grout	1430
	19	805 - 783	Stemming	
	20	783 - 766	19.32 Grout	1522
10-13-83	21	766 - 721	Stemming	
	22	721 - 713	19.32 Grout	1045
	23	713 - 690	Stemming	
	24	690 - 680	22.00 Grout	1312
	25	680 - 658	Stemming	
	26	658 - 649	22.00 Grout	1452
10-14-83	27	649 - 594	Stemming	
	28	594 - 585	22.00 Grout	1052
	29	585 - 565	Stemming	
	30	565 - 553	33.00 Grout	1420
	31	553 - 535	Stemming	
	32	535 - 525	22.00 Grout	1519
10-17-83	33	525 - 465	Stemming	
	34	465 - 457	22.00 Grout	1126
	35	457 - 390	Stemming	
	36	390 - 381	22.00 Grout	1437

	<u>Stage No.</u>	<u>Interval Ft.</u>	<u>Material Used Ft³</u>	<u>CIP Hrs.</u>
10-18-83	37	381 - 316	Stemming	
	38	316 - 306	22.00 Grout	1021
	39	306 - 239	Stemming	
	40	239 - 233	24.84 Grout	1410
	41	233 - 205	Stemming	
10-19-83	"	205 - 171	Stemming	
	42	171 - 164	22.08 Grout	0937
	43	164 - 116	Stemming	
	44	116 - 109	27.60 Grout	1315
	45	109 - 87	Stemming	
10-20-83	"	87 - 82	Stemming	
	46	82 - 78.5	85.56 Grout	1451
10-21-83	"	78.5 - 76	35.88 Grout	0906
	47	76 - 54	Stemming	
	48	54 - 48	52.44 Grout	1505
10-24-83	49	48 - 28	Stemming	
	50	28 - 21	93.84 Grout	1318
	51	21 - 0	Stemming	

Rigged down stemming and grouting equipment. Hole instrumented 10-24-83.

* Stemming includes layers of bentonite, 12-16 mesh sand, and silica flour.

** Grout is special chemical cementing composition per H&N.

Attached is STEMMING PLAN, "AS BUILT"

USW UZ-1
CORE RECORD

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	55.0 - 56.0	1.0	0.0	0
2	72.0 - 79.0	7.0	2.0	29
3	97.0 - 101.0	4.0	2.0	50
4	170.0 - 172.0	2.0	1.4	70
5	172.0 - 174.0	2.0	2.0	100
6	174.0 - 176.0	2.0	1.0	50
7	249.0 - 249.5	0.5	0.0	0
8	249.5 - 251.0	1.5	1.75	117
9	350.0 - 352.0	2.0	1.2	60
10	500.0 - 502.0	2.0	0.5	25
11	1000.0 - 1010.0	10.0	5.0	50
12	1258.0 - 1260.0	2.0	2.0	100
13	1264.0 - 1267.0	3.0	0.0	0
14	1267.0 - 1268.0	1.0	0.0	0
15 *	1265.0 - 1268.0	3.0	1.9	63
16 **	1266.5 - 1270.0	3.5	2.0	57

* 1265.0 - 1268.0 cored fill

** 1266.5 - 1268.0 cored fill

USW UZ-1
REVIEW OF HOLE CONDITIONS

1.07 m (42") casing was set at 12.0 m (39.5') in a 1.22 m (48") hole drilled to 12.6 m (41.5'). The annulus was cemented to 0.9 m (3') in 2 stages with 12.23 m³ (432 ft³) of Redi-Mix, 05-16-83. Calculated annular volume was 2.61 m³ (92 ft³). 914 mm (36") hole was drilled to 29.6 m (97') using the dual string reverse vacuum circulating method. Two cores were cut during drilling to 30.8 m (101'). 445 mm (17-1/2") hole was drilled to 383.4 m (1258') using reverse vacuum. Seven cores were cut during drilling. Fluid density and caliper logs were run 07-07-83. Hydrologic tests were conducted. The average curve on caliper log run #1 indicated eroded zones from 73.8 m (242') to 75.9 m (249') with maximum hole enlargement to 660 mm (26") at 75.6 m (248'), from 150.0 m (492') to 157.6 m (517') with maximum hole enlargement to 610 mm (24") at 150.3 m (493'), and from 257.9 m (846') to 264.9 m (869') with maximum hole enlargement to 603 mm (23-3/4"). One core was cut to 384.0 m (1260') and 244 mm (9-5/8") casing was landed at 383.1 m (1257'). Hydrologic tests were conducted and 244 mm (9-5/8") casing laid down. 445 mm (17-1/2") hole was then drilled to 385.6 m (1265') using reverse vacuum. Two cores were cut from fill during drilling to 387.1 m (1270'). 381 mm (15") hole was drilled to 386.8 m (1269'). Fluid density, caliper, electric, density, gamma ray-epithermal neutron, dielectric, gamma ray-spectrum logs were run 07-19-83 and 07-20-83. The average curve on caliper log run #2 indicated little change in hole condition. TV camera was run 07-20-83 and 07-21-83. The hole was cemented from fill at 386.5 m (1268') to 372.2 m (1221') in 1 stage with 2.12 m³ (75 ft³) of W-60 gypsum cement, 07-21-83. Calculated hole volume was 2.18 m³ (77 ft³). 445 mm (17-1/2") hole was redrilled to 377.6 m (1239') with 381 mm (15") cement cores cut to 382.5 m (1255'). Tools stuck on bottom of hole 07-26-83. Casing collar and fluid density logs were run and tools backed off at 378.9 m (1243') 07-27-83. Hole was cemented from fish at 378.9 m (1243') to 372.2 m (1221') in 1 stage with 0.99 m³ (35 ft³) of neat cement + 2% CaCl₂. Calculated hole volume was 1.13 m³ (40 ft³). Hole was completed 07-31-83. Water locator log was run to fill at 371.1 m (1217.5') and indicated no fluid, 10-03-83. 60 mm (2-3/8") fiberglass pipe with instruments attached was landed at 369.7 m (1213'). Casing collar locator and monitor logs were run during instrumentation. Instruments were stemmed and grouted as directed by H&N. Hole instrumented 10-24-83.

**FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI**

Approved: Jerry Full Covington
Date: July 1, 1987

Hole No.: UE-25 UZ #4		Type Hole: Unsaturated Zone Test Hole						
User: USGS	Area: 25	Site Prep. W.O. #: None						
Location: NTS	County: Nye	W.O. #: 3404-197						
Surface Coordinates: N 768,715.6' E 566,139.3'								
Ground Elev.: 3938.5'	Pad Elev.:	Top of Pipe Cap: 3939.1'						
Bottom Hole Coord: Not Surveyed @		Ref:						
Rig On Location: 09-06-84	Spudded: 09-06-84	Completed: 10-10-84						
Circulating Media: ODEX 115								
Main Rig & Contractor: Joy #2/REECO								
No. Of Compressors & Capacity: 1/GD 900								
Bore Hole Record		Casing Record						
From	To	Size	I.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	244'	6"	5"	14#	1/4"	0'	60'	
244'	367.5'	4.25"						
Total Depth: 367.5'		Plugs: None						
Fish: One 5' joint of 5-1/2" casing and 2.3' casing shoe down hole *								
Logging Data: Gamma ray								

Rigs Used							
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location	
85173	Joy #2	XIII	8.13	0.23	25.97	34.33	

Remarks: * Color TV camera ran 01-15-85 indicated top of fish at 231'.

Prepared By: LLF:ps Time Breakdown on Next Page

UE-25 UZ #4
HOLE HISTORY

- 09-04-84 Moved in support equipment. Worked on hammer bit and made up 5' core barrel. (Crew working day tour only.)
- 09-05-84 Moved in and started rigging up equipment. Started moving rig to location.
- 09-06-84 Moved in Joy #2, rig #85173 and rigged up. Drilled 6" hole from 0' to 2' cased with 5-1/2", 1/4" wall, 14# casing using the ODEX 115 system. Took sample 2' to 4' using ODEX system. Reamed hole to 6" to 4' cased with 5-1/2" casing. Took sample to 6' and reamed hole to 6" to 6' cased with 5-1/2" casing. Took sample to 8' and reamed hole to 6" to 8' cased with 5-1/2" casing.
- 09-07-84 Took sample from 8' to 10', drive shoe broke off. Recovered drive sample shoe and pulled 5-1/2" casing. Reamed hole to 6" to 10' cased with 5-1/2" casing. Secured rig for weekend.
- 09-10-84 Rig secured from 09-07-84 to 09-10-84. Repaired drive sample tool. Took sample from 10' to 12' and reamed hole to 6" to 12' cased with 5-1/2" casing. Attempted to take sample, hit rock at 12.5'. Reamed and drilled 6" hole from 12' to 14' cased with 5-1/2" casing. Took sample from 14' to 16'. Reamed and drilled 6" hole from 14' to 18' cased with 5-1/2" casing. Took sample from 18' to 19'. Reamed and drilled 6" hole from 18' to 20' cased with 5-1/2" casing. Took sample from 20' to 22'. Reamed and drilled 6" hole from 20' to 24' cased with 5-1/2" casing.
- 09-11-84 Took sample from 24' to 26'. Reamed and drilled 6" hole from 24' to 28' cased with 5-1/2" casing. Took sample from 28' to 30'. Reamed and drilled 6" hole from 28' to 32' cased with 5-1/2" casing. Took sample from 32' to 34'. Reamed and drilled 6" hole from 32' to 36' cased with 5-1/2" casing. Took sample from 36' to 38'. Reamed hole to 6" from 36' to 38' cased with 5-1/2" casing. Took sample from 38' to 39' and from 39' to 40.5'.
- 09-12-84 Replaced wire line and air tigger to 1000 hours. Reamed and drilled 6" hole from 38' to 47' cased with 5-1/2" casing. Changed from ODEX drive-core sampler to HCQ-3 core barrel. HQ cored from 47' to 49' using air. Reamed and drilled 6" hole from 47' to 50' cased with 5-1/2" casing.
- 09-13-84 Drilled 6" hole from 50' to 57' cased with 5-1/2" casing. HQ cored from 57' to 58'. Reamed and drilled 6" hole from 57' to 67' cased with 5-1/2" casing. HQ cored from 67' to 68'. Reamed and drilled 6" hole from 67' to 75' cased with 5-1/2" casing, hammer drill kept mudding up with clay. HQ cored from 75' to 76'.
- 09-14-84 Reamed hole to 6" from 75' to 76', hammer drill plugged up with clay. Unplugged bit and attempted to drill 6" hole, drill continued plugging up. Made trip for HX split type core barrel

UE-25 UZ #4
Hole History
Page 2

- 09-14-84 (cont.) and 4.25" x 2-3/8" core bit. HX cored from 76' to 86'. Reamed and drilled 6" hole from 76' to 97' cased with 5-1/2" casing, encountered water at 86'.
- 09-17-84 Rig secured from 09-14-84 to 09-17-84. HX cored from 97' to 101.5'. Pulled 5-1/2" casing up to 86'. Ran 3-1/2" bailer, no fluid recovery. Lowered casing to 97'. Reamed and drilled 6" hole from 97' to 105' cased with 5-1/2" casing. HX cored from 105' to 107'. Reamed and drilled 6" hole from 105' to 110' cased with 5-1/2" casing. HX cored from 110' to 118.5'.
- 09-18-84 Reamed hole to 6" from 110' to 117' cased with 5-1/2" casing. HX cored from 118.5' to 129' using wireline core barrel.
- 09-19-84 HX cored from 129' to 147'. Reamed hole to 6" from 117' to 131' cased with 5-1/2" casing.
- 09-20-84 Reamed and drilled 6" hole from 131' to 147' cased with 5-1/2" casing. HX cored from 147' to 177'.
- 09-21-84 Reamed hole to 6" from 147' to 177' cased with 5-1/2" casing. HX cored from 177' to 189'.
- 09-24-84 Rig secured from 09-21-84 to 09-24-84. Attempted to take sample using drive sample tool, hole tight and sticky. HX cored from 189' to 207'.
- 09-25-84 Reamed hole to 6" from 177' to 207' cased with 5-1/2" casing. HX cored from 207' to 223'.
- 09-26-84 HX cored from 223' to 237'. Reamed hole to 6" from 207' to 226' cased with 5-1/2" casing, unable to drive casing deeper.
- 09-27-84 Changed insert core head to diamond core head. HX cored from 237' to 251'.
- 09-28-84 HX cored from 251' to 284'. Pulled tools up in 5-1/2" casing and secured rig for weekend.
- 10-01-84 Rig secured from 09-28-84 to 10-01-84. HX cored from 284' to 307'.
- 10-02-84 Rig secured to 1230 hours. HX cored from 307' to 315'.
- 10-03-84 HX cored from 315' to 343'.
- 10-04-84 HX cored from 343' to 349.75', bit stopped cutting. Laid down core tools. Hole deep enough as directed by USGS. Pulled 5-1/2" casing up 5' to 221'. Attempted to work 6" ODEX hammer bit below parted 5-1/2" drive casing shoe. Worked on broken hydraulic hose.

UE-25 UZ #4
Hole History
Page 3

- 10-05-84 Worked bit thru casing shoe and reamed hole to 6" from 226' to 244', parted casing shoe slipped over bit. Worked ODEX assembly cut of hole. Secured rig for weekend.
- 10-08-84 Rig secured from 10-05-84 to 10-08-84. Changed plans to core hole deeper. Made trip in with core bit and barrel and cleaned out fill from 348' to 349.75'. HX cored from 349.75' to 359.75'.
- 10-09-84 HX cored from 359.75' to 367.5', core bit stopped cutting. Laid down HCQ rods, core barrel, and bit. Pulled and laid down seventeen 5' joints of 5-1/2" casing. Ran USGS gamma ray log to 140', log indicated bottom of 5-1/2" casing at 129' with bottom 5' joint and 2.3' casing drive shoe down the hole.
- 10-10-84 Pulled 5-1/2" casing up to 60'. Rigged down and moved out. Hole completed 10-10-84.
- 12-18-84 Attempted to run Westech TV camera using Birdwell mast. Moisture on lens interfered with picture.
- 01-14-85 Attempted to run Westech TV camera using Birdwell mast, camera equipment not operating properly.
- 01-15-85 Ran Westech 3-1/2" O.D. color TV camera to 366.8' using Dresser Atlas mast. Camera indicated clean hole with top of 5-1/2" x 7.3' fish at 231'.
- 03-18-86 Ran Westech 3-1/2" O.D. color TV camera to 360' T.D.

**UE-25 UZ #4
CORE RECORD**

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	47.0 - 49.0	2.0	2.0	100
2	57.0 - 58.0	1.0	0.8	80
3	67.0 - 68.0	1.0	1.0	100
4	75.0 - 76.0	1.0	0.8	80
5	76.0 - 81.0	5.0	5.0	100
6	81.0 - 86.0	5.0	4.0	80
7	97.0 - 101.5	4.5	4.1	91
8	105.0 - 107.0	2.0	2.2	110
9	110.0 - 115.0	5.0	4.8	96
10	115.0 - 118.5	3.5	3.5	100
11	118.5 - 122.0	3.5	3.5	100
12	122.0 - 127.0	5.0	5.5	110
13	127.0 - 132.0	5.0	4.5	90
14	132.0 - 137.0	5.0	5.3	106
15	137.0 - 142.0	5.0	5.1	102
16	142.0 - 147.0	5.0	5.0	100
17	147.0 - 152.0	5.0	5.2	104
18	152.0 - 157.0	5.0	4.6	92
19	157.0 - 162.0	5.0	2.2	44
20	162.0 - 167.0	5.0	5.0	100
21	167.0 - 171.0	4.0	0.8	20
22	171.0 - 173.0	2.0	2.0	100
23	173.0 - 177.0	4.0	2.7	68
24	177.0 - 182.0	5.0	4.1	82
25	182.0 - 187.0	5.0	2.7	54
26	187.0 - 189.0	2.0	0.8	40
27	189.0 - 192.0	3.0	2.2	73
28	192.0 - 195.0	3.0	2.8	93
29	195.0 - 200.0	5.0	4.3	86
30	200.0 - 202.0	2.0	1.8	90
30a	202.0 - 204.0	2.0	1.0	50
31	204.0 - 207.0	3.0	2.7	90
32	207.0 - 210.7	3.7	3.7	100
33	210.7 - 213.0	2.3	2.3	100
34	213.0 - 216.0	3.0	2.8	93
35	216.0 - 219.5	3.5	3.5	100
36	219.5 - 223.0	3.5	3.5	100
37	223.0 - 228.0	5.0	5.0	100
38	228.0 - 233.0	5.0	5.1	102
39	233.0 - 237.0	4.0	4.0	100
40	237.0 - 241.5	4.5	4.65	103
41	241.5 - 246.0	4.5	4.55	101
42	246.0 - 251.0	5.0	5.15	103
43	251.0 - 256.0	5.0	5.1	102
44	256.0 - 261.0	5.0	4.6	92
45	261.0 - 266.0	5.0	5.1	102
46	266.0 - 270.0	4.0	4.3	108
47	270.0 - 275.0	5.0	4.7	94

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
48	275.0 - 280.0	5.0	5.15	103
49	280.0 - 284.0	4.0	4.4	110
50	284.0 - 289.0	5.0	5.15	103
51	289.0 - 294.0	5.0	5.0	100
52	294.0 - 299.0	5.0	5.0	100
53	299.0 - 304.0	5.0	4.9	98
54	304.0 - 307.0	3.0	3.0	100
55	307.0 - 310.0	3.0	2.6	87
56	310.0 - 315.0	5.0	4.9	98
57	315.0 - 320.0	5.0	4.8	96
58	320.0 - 325.0	5.0	5.2	104
59	325.0 - 330.0	5.0	4.2	84
60	330.0 - 335.0	5.0	4.6	92
61	335.0 - 340.0	5.0	4.5	90
62	340.0 - 342.0	2.0	2.5	125
63	342.0 - 343.0	1.0	1.3	130
64	343.0 - 347.0	4.0	4.0	100
65	347.0 - 349.0	2.0	2.3	115
66	349.0 - 349.75	0.75	0.75	100
67	349.75- 354.75	5.0	4.9	98
68	354.75- 359.75	5.0	4.6	92
69	359.75- 364.75	5.0	5.2	104
70	364.75- 366.75	2.0	2.3	115
71	366.75- 367.5	0.75	0.0	0

UE-25 UZ #4
REVIEW OF HOLE CONDITIONS

152 mm (6") hole cased with 140 mm (5-1/2") casing was drilled to 74.4 m (244') using ODEX 115 system. Soil samples were taken to 12.3 m (40.5') and 72 cores were cut to a total depth of 112.0 m (367.5'). Gamma ray log was run 10-09-84. 140 mm (5-1/2") casing was pulled up and set at 18.3 m (60'). One 1.5 m (5') joint of 140 mm (5-1/2") casing and 0.7 m (2.3') casing shoe were left in the hole. Hole was completed 10-10-84. Color TV camera ran to 111.8 m (366.8') 01-15-85, indicated top of fish at 70.4 m (231'). Color TV was run to 109.7 m (360'), 03-18-86.

**FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI**

Approved: Jerry Neil Covington
Date: May 11, 1987

Hole No.: UE-25 UZ #5	Type Hole: Unsaturated Zone Test Hole
User: USGS	Area: 25
Location: NTS	County: Nye
Surface Coordinates: N 768,591.0' N 566,135.2'	W.O. #: 3404-198
Ground Elev.: 3951.6'	Pad Elev.:
Bottom Hole Coord: Not Surveyed	Top of Pipe Cap.: 3952.8'
Rig On Location: 10-10-84	Spudded: 10-11-84
Completed: 11-19-84	
Circulating Media: ODEX 115	
Main Rig & Contractor: Joy #2/REECO	
No. Of Compressors & Capacity: 1/GD 900	

Bore Hole Record			Casing Record					
From	To	Size	I.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	365'	6"	5"	14#	1/4"	0'	18'	

Total Depth: 365' Plugs: None
Junk: 2' casing shoe
Logging Data: None

Rigs Used						
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location
85173	Joy #2	XIII	6.21	0.02	34.04	40.27

Remarks:

Prepared By: LLF:ps Time Breakdown on Next Page

UE-25 UZ #5
HOLE HISTORY

- 10-10-84 Moved in Joy #2, rig #85173 and started rigging up.
- 10-11-84 Rigged up. Drilled 6" hole from 0' to 7' cased with 5-1/2", 1/4" wall, 14# casing using ODEX 115 system. Made up HCQ core bit (4.25" x 2.5") and wireline core barrel on HCQ rods. HCQ cored from 7' to 8'. Reamed and drilled 6" hole from 7' to 17' cased with 5-1/2" casing. HCQ cored from 17' to 18'. (Crew working day tour only.)
- 10-12-84 Reamed and drilled 6" hole from 17' to 27' cased with 5-1/2" casing. HCQ cored from 27' to 28', no core recovery. Reamed and drilled 6" hole from 27' to 37' cased with 5-1/2" casing. Secured rig for weekend at 1200 hours.
- 10-15-84 Rig secured from 10-12-84 to 10-15-84. Drilled 6" hole from 37' to 46' cased with 5-1/2" casing. HCQ cored from 46' to 47'. Reamed and drilled 6" hole from 46' to 92' cased with 5-1/2" casing.
- 10-16-84 HCQ cored from 92' to 127' using only air.
- 10-17-84 Laid down tools and moved out ODEX drilling equipment. Secured rig at 1030 hours.
- 10-18-84 Rig secured from 10-17-84 to 1430 hours. Started moving in ODEX drilling system and wire line coring equipment.
- 10-19-84 Rigged up. Reamed hole to 6" from 92' to 99' cased with 5-1/2" casing, casing parted at bottom. Made trip out stripping 5-1/2" casing off drill pipe. Casing had parted at pin end of bottom joint and casing drive shoe. Replaced bottom joint and drive shoe. Made trip in with 5-1/2" casing and 6" drilling assembly to 20'. Pushed and drive drilled 5-1/2" casing to 97'. Secured rig.
- 10-31-84 Rig secured from 10-19-84 to 0830 hours, 10-31-84. Rigged up. Drive drilled 5-1/2" casing to 99'. Reamed 6" hole from 99' to 127' cased with 5-1/2" casing. HCQ cored from 127' to 140'.
- 11-01-84 HCQ cored from 140' to 147'. Changed from drag core bit to HCQ diamond core bit (4.25" x 2.5") due to hard formation. HCQ cored from 147' to 160'.
- 11-02-84 HCQ cored from 160' to 209'. Changed from HCQ diamond core bit to HCQ drag core bit (4.25" x 2.5") at 170'. Secured rig for weekend.
- 11-05-84 Rig secured from 11-02-84 to 11-05-84. Reamed and drilled hole to 6" from 127' to 212' cased with 5-1/2" casing. HCQ cored from 212' to 222'.
- 11-06-84 HCQ cored from 222' to 247'.

UE-25 UZ #5
Hole History
Page 2

- 11-07-84 Changed from drag core bit to diamond core bit (4.25" x 2.5"). HCQ cored from 247' to 272'.
- 11-08-84 HCQ cored from 272' to 302'. Encountered soft formation at 277' and changed to insert carbon core bit (4.25" x 2.5").
- 11-09-84 HCQ cored from 302' to 347'. Secured rig for weekend and holiday at 1600 hours.
- 11-13-84 Rig secured from 11-09-84 to 11-13-84. HCQ cored from 347' to 360'. Encountered hard formation at 354' and changed to diamond core bit (4.25" x 2.5").
- 11-14-84 Changed to impregnated core bit (4.25" x 2.5"). HCQ cored from 360' to 360.5', formation too hard. Laid down wire line core assembly. Reamed hole to 6" from 212' to 282' cased with 5-1/2" casing using ODEX system.
- 11-15-84 Reamed hole to 6" from 282' to 353' cased with 5-1/2" casing, casing parted at shoe. Reamed hole to 360.5' and drilled 6" hole to 365'.
- 11-16-84 Pulled and laid down ODEX drilling tools. Pulled and laid down sixty-six 5' joints of 5-1/2" casing. Left four 5' joints in the hole from surface to 20' and 5-1/2" parted casing shoe (2' length) down the hole. Welder secured casing at surface. Secured rig for weekend at 1600 hours.
- 11-19-84 Rig secured from 11-16-84 to 11-19-84. Reset 5-1/2" casing from 20' to 18'. Rigged down and moved out rig and equipment. Hole completed 11-19-84.
- 01-15-85 Ran Westech color TV camera to fill at 350' using Dresser Atlas mast. Camera indicated very bad hole from 17' to 90', rest of hole looked good.

**UE-25 UZ #5
CORE RECORD**

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	7.0 - 8.0	1.0	0.9	90
2	17.0 - 18.0	1.0	1.0	100
3	27.0 - 28.0	1.0	0.0	0
4	46.0 - 47.0	1.0	1.1	110
5	92.0 - 97.0	5.0	5.0	100
6	97.0 - 102.0	5.0	4.6	92
7	102.0 - 107.0	5.0	5.0	100
8	107.0 - 112.0	5.0	5.0	100
9	112.0 - 117.0	5.0	5.2	104
10	117.0 - 122.0	5.0	4.8	96
11	122.0 - 127.0	5.0	5.0	100
12	127.0 - 132.0	5.0	5.0	100
13	132.0 - 137.0	5.0	5.1	102
14	137.0 - 142.0	5.0	4.7	94
15	142.0 - 147.0	5.0	4.9	98
16	147.0 - 152.0	5.0	4.7	94
17	152.0 - 155.0	3.0	3.0	100
18	155.0 - 160.0	5.0	5.0	100
19	160.0 - 165.0	5.0	4.9	93
20	165.0 - 170.0	5.0	1.7	34
21	170.0 - 175.0	5.0	2.8	56
22	175.0 - 180.0	5.0	3.8	76
23	180.0 - 185.0	5.0	4.4	88
24	185.0 - 190.0	5.0	4.1	82
25	190.0 - 195.0	5.0	3.0	60
26	195.0 - 200.0	5.0	4.6	92
27	200.0 - 205.0	5.0	4.3	86
28	205.0 - 209.0	4.0	3.0	75
29	212.0 - 217.0	5.0	4.7	94
30	217.0 - 222.0	5.0	5.1	102
31	222.0 - 227.0	5.0	5.15	103
32	227.0 - 232.0	5.0	5.25	105
33	232.0 - 237.0	5.0	5.1	102
34	237.0 - 242.0	5.0	5.05	101
35	242.0 - 247.0	5.0	5.0	100
36	247.0 - 252.0	5.0	5.1	102
37	252.0 - 257.0	5.0	5.0	100
38	257.0 - 262.0	5.0	5.1	102
39	262.0 - 267.0	5.0	5.05	101
40	267.0 - 272.0	5.0	5.2	104
41	272.0 - 277.0	5.0	4.5	90
42	277.0 - 282.0	5.0	5.2	104
43	282.0 - 287.0	5.0	5.2	104
44	287.0 - 292.0	5.0	4.5	90
45	292.0 - 297.0	5.0	5.2	104
46	297.0 - 302.0	5.0	5.0	100
47	302.0 - 307.0	5.0	5.1	102
48	307.0 - 312.0	5.0	4.8	96

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
49	312.0 - 317.0	5.0	4.8	96
50	317.0 - 322.0	5.0	5.05	101
51	322.0 - 327.0	5.0	5.0	100
52	327.0 - 332.0	5.0	5.0	100
53	332.0 - 337.0	5.0	5.0	100
54	337.0 - 342.0	5.0	5.0	100
55	342.0 - 347.0	5.0	5.1	102
56	347.0 - 352.0	5.0	5.2	104
57	352.0 - 354.0	2.0	2.2	110
58	354.0 - 358.0	4.0	3.6	90
59	358.0 - 360.0	2.0	2.4	120
60	360.0 - 360.5	0.5	0.3	60

UE-25 UZ #5
REVIEW OF HOLE CONDITIONS

152 mm (6") hole cased with 140 mm (5-1/2") casing was drilled to 111.2 m (365') using ODEX 115 system. A total of sixty 108 mm (4.25") cores were cut during drilling. 140 mm (5-1/2") casing was reset to 5.5 m (18'). Casing shoe 0.6 m (2') was left in the hole. Hole was completed 11-19-84. Color TV camera ran to fill at 106.7 m (350') 01-15-85, indicated very bad hole from 5.2 m (17') to 27.4 m (90') and rest of the hole good.

FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI

Approved: *Jerry Neil Covington*
 Date: *May 4, 1987*

Hole No.: USW UZ-6 | Type Hole: Unsaturated Zone Test Hole
 User: USGS | Area: Off Site | Site Prep. W.O. #: None
 Location: NTS | County: Nye | W.O. #: 3404-193A
 Surface Coordinates: L/O N 759,731' - E 558,325'
 Ground Elev.: | Pad Elev.: 4924.5' | Top Casing Elev.:
 Bottom Hole Coord: N 759,733.72' E 558,336.53' @ 1834' | Ref: Seeker Gyro 9-27-84
 Rig On Location: 6-12-84 | Spudded: 6-18-84 | Suspended: 04-28-86
 Circ.Media: Dual & single string-reverse-vacuum(8-5/8" x 5-1/2")(6-5/8")(5-1/2")
 Main Rig & Contractor: Ideco 525-REECO
 No. Of Compressors & Capacity: None

Bore Hole Record			Casing Record					
From	To	Size	I.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	40'	30"	26"		3/8"	0'	40'	189
40'	341'	24"	20"O.D.*		3/8".1/2"	0'	324'	Tacked
341'	1887'	17-1/2"***						

Total Depth: 1887' | Plugs: None
 Junk: Hard hat dropped down hole 11-13-84.
 Logging Data: Caliper (3), Density (1), Fluid density (1), Spectralog (1),
 Epithermal neutron (2), Electric (3), Gamma ray-Temperature (2), Vibroseis (1)

Rigs Used							
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location	
85124	Ideco 525 ***	II	70.67	0.31	147.69	218.67	

Remarks: * Joints #1 thru #5 - 3/8" wall casing, #6 thru #8 - 1/2" wall casing.
 ** Last drilling date was 09-26-84.
 *** Rig time thru last activity, 01-16-85.

Prepared By: JFC:LLF:ps | Time Breakdown on Next Page

USW UZ-6
HOLE HISTORY

- 06-12-84 Moved in Ideco 525, rig #85124 and equipment. Started rigging up.
- 06-13-84 Moved in equipment and continued rigging up.
- 06-14-84 Continued rigging up.
- 06-15-84 Continued rigging up and secured rig for weekend.
- 06-18-84 Rig secured from 06-15-84 to 06-18-84. Rigged up. Made up hammer drill. Drilled 30" hole from 0' to 40' using air, hole sloughing. Made trip for 17-1/2" bit on 8-5/8" drill pipe. Cleaned out 6.5' fill to 39' using vacuum and laid down tools. Ran and set 1 joint of 26" I.D., 3/8" wall casing with bottom belled at 40'. Cemented the annulus to surface using REECO truck with 189 ft³ of Redi-Mix cement (7 sk. mix). CIP at 2230 hours. Calculated annular volume was 40 ft³.
- 06-19-84 Rigged for vacuum drilling and made up 17-1/2" drilling assembly on 8-5/8" x 5-1/2" dual string drill pipe. Cleaned out hole to 40'. Drilled 17-1/2" hole from 40' to 50' with 25 rpm, 5/10,000# wt. on bit using 10" vacuum
- 06-20-84 Drilled 17-1/2" hole from 50' to 140' with 30/45 rpm, 3/10,000# wt. on bit using 10" vacuum.
- 06-21-84 Drilled 17-1/2" hole from 140' to 240' with 30/35 rpm, 5/10,000# wt. on bit, using 15/16" vacuum.
- 06-22-84 Drilled 17-1/2" hole from 240' to 310' with 30/40 rpm, 5/15,000# wt. on bit, using 13/16" vacuum. Cleaned out 8' fill at 305'. Made trip out and secured rig for weekend at 2400 hours.
- 06-25-84 Rig secured from 06-22-84 to 06-25-84. Moved out support equipment for rig at USW H-6. Rig secured.
- 06-28-84 Rig secured from 06-25-84 to 0800 hours, 06-28-84. Moved in support equipment and rigged up. Started in the hole with 17-1/2" bit on 8-5/8" x 5-1/2" dual string drill pipe, hole tight.
- 06-29-84 Reamed hole from 181' to 293' and cleaned out fill to 310'. Drilled 17-1/2" hole from 310' to 316' with 30/45 rpm, 5/15,000# wt. on bit, using 14" vacuum. Conditioned hole, hole sloughing. Made trip out, dressed bit and bottom stabilizer. Secured rig for weekend at 2400 hours.
- 07-02-84 Rig secured from 06-29-84 to 07-02-84. Made trip in and cleaned out 4' fill. Drilled 17-1/2" hole from 316' to 336' with 30/45 rpm, 5/15,000# wt. on bit, using 14/16" vacuum. Hole continued sloughing.

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Hole History
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- 07-03-84 Drilled 17-1/2" hole from 336' to 337', hole sloughing. Continued cleaning out fill. Pulled 100,000# over string to get off bottom due to sloughing. Made trip out. Ran SNL TV camera to bridge at 150', camera indicated hole overgauged from surface casing to bridge. Made trip in and cleaned out bridge and fill from 326' to 332'. Made trip out and secured rig for holiday at 2400 hours.
- 07-05-84 Rig secured from 07-03-84 to 07-05-84. Made trip in, cleaned out bridge at 227' and cleaned out fill from 325' to 337', hole continued sloughing. Drilled 17-1/2" hole from 337' to 338' with 30/40 rpm, 10/15,000# wt. on bit, using 14/17" vacuum. Pulled up for fill check. Cleaned out fill from 330' to 334', hole continued sloughing to 330'. Made trip for 24" bit on 8-5/8" single string drill pipe. Reamed hole from 45' to 147' using no circulation.
- 07-06-84 Reamed hole to 24" from 147' to 257'. Pulled up and checked no fill. Made trip for 17-1/2" bit on dual string (8-5/8" x 5-1/2") drill pipe to fill at 313'. Cleaned out hole from 313' to 317', separators and tools kept plugging up. Made trip out and secured rig for weekend at 2400 hours.
- 07-09-84 Rig secured from 07-06-84 to 07-09-84. Cleaned out vacuum system and made trip in. Replaced 4" vacuum hoses. Cleaned out fill from 312' to 324' with 30/45 rpm, 5/15,000# wt. on bit, using 14/16" vacuum. Made trip out to unplug tools.
- 07-10-84 Unplugged drill collars and made trip in checking tool joints. Cleaned out fill from 322' to 333' with 30/45 rpm, 15/30,000# wt. on bit, using 14/16" vacuum. Hole continued sloughing.
- 07-11-84 Cleaned out fill to 338', hole sloughing on fill checks. Drilled 17-1/2" hole from 338' to 355' with 30/45 rpm, 10/25,000# wt. on bit, using 14/17" vacuum.
- 07-12-84 Drilled 17-1/2" hole from 355' to 364' with 35/40 rpm, 20,000# wt. on bit, using 15" vacuum. Tools stuck while making connection. Pulled to 125,000# over string wt. to free tools. Cleaned out fill from 338' to 364'. Made trip for bit change. Cleaned out fill from 346' to 364'. Made connection and cleaned out fill from 359' to 360'.
- 07-13-84 Cleaned out fill from 360' to 364'. Drilled 17-1/2" hole from 364' to 377' with 25/40 rpm, 20,000# wt. on bit, using 14/16" vacuum. Made trip out, pulled 225,000# tension to free tools at 338'. Ran SNL TV camera to fill at 335', pictures recorded. Waited on orders from 1400 hours to 1600 hours. Attempted to open hole to 24", wind too high. Secured rig for weekend at 2400 hours.

- 07-16-84 Rig secured from 07-13-84 to 07-16-84. Made trip in with 24" bit and opened 17-1/2" hole to 24" from 257' to 341' using no circulation. Made trip out. Ran SNL TV camera. Rigged up to modify dry cyclone. Changed orders and rigged up to run casing. Aligned and welded 20" O.D., 3/8" wall casing. Started in the hole, unable to get below 41.8'. Laid down casing.
- 07-17-84 Ran and spudded thru bridge at 41.8' and made trip out. Attempted to run 20" casing, unable to get below 41.8'. Attempted to run 20" casing without guide shoe, unable to get below 41.8'. Laid down casing. Laid down dry separator for modification. Moved out support equipment and secured rig at 1600 hours.
- 07-20-84 Rig secured from 07-17-84 to 1600 hours, 07-20-84. Moved in support equipment and set dry separator in place. Secured rig for weekend at 2400 hours.
- 07-23-84 Rig secured from 07-20-84 to 07-23-84. Rigged up and connected up dry separator. Laid down 24" drilling assembly. Made up new 24" drilling assembly on 8-5/8" x 5-1/2" dual string drill pipe. Drilling assembly consisted of 24" hole opener, #1 button tooth roller reamer, #2 and #3 mill tooth roller reamers. Made trip and reamed hole from 41' to 47' using no circulation.
- 07-24-84 Reamed hole from 47' to 105' using 14/16" vacuum. Reamed hole from 105' to fill at 320' using air at intervals. Made trip out and set back hole opener assembly with reamers.
- 07-25-84 Made trip in with 17-1/2" drilling assembly on 8-5/8" x 5-1/2" dual string drill pipe. Cleaned out fill from 318' to 327' using 13/17" vacuum, hole continued sloughing.
- 07-26-84 Cleaned out hole from 327' to 328' with hole sloughing. Made trip out. Laid down 24" hole opener assembly. Rigged up to run 20" casing. Started aligning, welding, and lowering 20" O.D. casing in the hole.
- 07-27-84 Aligned, welded, and set joints #1 thru #8 at 324.43', bottom of joint #1 was belled. Joints #1 thru #5 of 20" O.D., 3/8" wall casing top at 100.55' and joints #6 thru #8 of 20" O.D., 1/2" wall casing to surface. Landed 2-3/8" Hydril grout line inside casing at 306'. Mixed LiBr in cement water. Cemented the casing and hole using Halliburton as follows:

<u>Stage No.</u>	<u>Interval</u>	<u>Cement Used Ft³</u>	<u>Calc. Ft³</u>	<u>CIP</u>
1	328' - 322'	200 neat cement + 150# D-19 fric- tion reducer.	19	0900 Hrs.

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Hole History
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07-27-84 Secured 20" casing to 26-3/4" surface casing. Secured rig for
(Cont.) weekend at 2400 hours.

07-30-84 Rig secured from 07-27-84 to 07-30-84. Made trip in with 17-1/2" drilling assembly on dual string 8-5/8" x 5-1/2" drill pipe. Drilled out cement and fill from 322.5' to 332', checked fill at 331'. Made trip out. Ran and landed 2-3/8" Hydril grout line inside casing at 305.5'. Cemented the hole as follows using LiBr water mix:

<u>Stage No.</u>	<u>Interval</u>	<u>Cement Used Ft³</u>	<u>Calc. Ft³</u>	<u>CIP</u>
2	331' - 325'	110 neat cement + 2200# of Gilsonite & 75# of D-19	19	1315 Hours
3	325' - 324'	100 neat cement + 75# of D-19	3	1710 "
Totals		410 ft ³	41 ft ³	

Laid down 2-3/8" grout line.

07-31-84 Made trip in and drilled out cement from 324' to 332'. Cleaned out cement and fill to 337' and fill to 377' with 30/40 rpm, 2/8000# wt. on bit, using 13/15" vacuum. Drilled 17-1/2" hole from 377' to 385' with 30/40 rpm, 5/8000# wt. on bit, using 13/15" vacuum.

08-01-84 Drilled 17-1/2" hole from 385' to 489' with 30/90 rpm, 3/20,000# wt. on bit, using 13/15" vacuum. Cleaned out 2' fill at 394'. Damp cuttings at 457'.

08-02-84 Drilled 17-1/2" hole from 489' to 520'. Made trip out and ran SNL TV camera to boulders at 420', unable to get deeper. Made trip in and cleaned out 5' fill. Drilled 17-1/2" hole from 520' to 554' with 30/40 rpm, 5/10,000# wt. on bit, using 14/15" vacuum.

08-03-84 Drilled 17-1/2" hole from 554' to 696' with 40 rpm, 3/15,000# wt. on bit, using 14/15" vacuum. Cleaned out wet separator at 568' and at 600'. Pulled up tools into casing and cleaned out wet and dry separators. Secured rig for weekend at 2400 hours.

08-06-84 Rig secured from 08-03-84 to 08-06-84. Lowered tools, cleaned out bridge at 420' and 7' fill. Drilled 17-1/2" hole from 696' to 761' with 40/45 rpm, 3/15,000# wt. on bit, using 13/15" vacuum. Cleaned wet separator at 760'.

08-07-84 Drilled 17-1/2" hole from 761' to 778'. Made trip out. Ran SNL black and white TV camera to 778'. Ran Birdwell caliper log to

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Hole History
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- 08-07-84 770' T.D., temperature-gamma ray log to 771' T.D., and epithermal
(Cont.) neutron log to 770' T.D.
- 08-08-84 Ran formation density log to 771' T.D. Made trip in with 17-1/2"
drilling assembly on 8-5/8" x 5-1/2" dual string drill pipe,
cleaned out tight hole at 420' and 7' fill. Drilled 17-1/2" hole
from 778' to 801' with 30/50 rpm, 5/10,000# wt. on bit, using
14/15" vacuum.
- 08-09-84 Drilled 17-1/2" hole from 801' to 833' with 30/46 rpm, 8/20,000#
wt. on bit, using 13/15" vacuum. Cleaned out 1' of fill on single
shot survey at 819'.
- 08-10-84 Drilled 17-1/2" hole from 833' to 839' with 45/48 rpm, 10/20,000#
wt. on bit, using 14/15" vacuum, hole sloughed in. Worked stuck
tools with up to 415,000# tension using 1-2 Atlas 1200 compressors
and Joy booster. Rotary clutch burnt out. Secured rig with
250,000# tension on tools at 2400 hours for weekend.
- 08-13-84 Rig secured from 08-10-84 to 08-13-84. Worked stuck tools with
400,000# tension and 700/290 psi down inner string with no returns.
Torqued kelly to left and pulled up with 105,000# string weight.
Made trip out, left 17-1/2" bit, 17-1/2" reamer, and 5- 1/2" inner
string from bottom drill collar in the hole. (Top of inner string
at 808.74' and top of reamer at 830.68'.)
- 08-14-84 Made trip in with 17-1/2" bit and tagged fill or fish at 802.38'.
Attempted to circulate with no rotation, 1000# wt. on bit, and
14-1/2" vacuum, no returns. Made trip out. Ran SNL TV camera to
791', top of 5-1/2" inner string exposed and in center of hole.
Made trip in with 15-1/2" O.D. skirt, 5-1/2" grapple, Bowen jars,
and bumper sub and tagged fish at 802'. Latched onto 5-1/2" inner
string and started out of hole.
- 08-15-84 Made trip out, recovered 5-1/2" inner string. Ran SNL TV camera to
fill at 813'. Made trip measuring in with 17-1/2" drilling
assembly and cleaned out fill from 817' to top of fish at 830'.
Checked for fill and made trip out. Made trip in with double
overshot, 11-1/4" grapple and Bowen hydro-mechanical drilling jars
on 8-5/8" x 5-1/2" drill pipe. Cleaned out 2' fill and worked
tools over fish. Overshot unlatched from fish.
- 08-16-84 Made trip out and replaced broken 11-1/4" grapple with new 11"
grapple. Made trip in and worked overshot over fish. Worked tools
with 400,000# pull, jars quit working, unable to release fish.
Rigged up casing jacks. Jacked drill pipe to 471,000# and moved
tools up 28".

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- 08-17-84 Jacked drill pipe up a total of 5.5', tools free. Made trip out, recovered all of fish. Sent 11" drill collars to area 6 machine shop. Laid down 8-5/8" x 5-1/2" drill pipe and secured rig for weekend at 2400 hours.
- 08-20-84 Rig secured from 08-17-84 to 08-20-84. Measured and stood 8-5/8" x 5-1/2" drill pipe in the derrick. Made up and lowered in the hole 17-1/2" bit on six reworked 11" dual string drill collars. Made trip in and cleaned out 6' fill. Drilled 17-1/2" hole from 839' to 850' with 30/40 rpm, 5/10,000# wt. on bit, using 14/16" vacuum. Ran survey and cleaned out 2' fill at 841'.
- 08-21-84 Drilled 17-1/2" hole from 850' to 915' with 40/50 rpm, 5/10,000# wt. on bit, using 14/16" vacuum, no fill at connections.
- 08-22-84 Drilled 17-1/2" hole from 915' to 1001' with 40/45 rpm, 5/12,000# wt. on bit, using 14/16" vacuum. Cleaned out 1' fill on connection at 937'. Made trip for bit change at 969' and cleaned out 3' fill.
- 08-23-84 Cleaned out 1' fill. Drilled 17-1/2" hole from 1001' to 1085' with 40/50 rpm, 6/15,000# wt. on bit, using 15/16" vacuum. Levelled rig at 1040'.
- 08-24-84 Drilled 17-1/2" hole from 1085' to 1108' with 40 rpm, 10/15,000# wt. on bit, using 14/16" vacuum. Relevelled rig at 1097'. Pulled tools up in 20" casing and secured rig for weekend at 2400 hours.
- 08-27-84 Rig secured from 08-24-84 to 08-27-84. Pulled tools up, changed bit, made trip in, and cleaned out 5' fill. Drilled 17-1/2" hole from 1108' to 1161' with 35/45 rpm, 8/15,000# wt. on bit, using 14/16" vacuum.
- 08-28-84 Drilled 17-1/2" hole from 1161' to 1183' with 35/45 rpm, 5/10,000# wt. on bit, using 13/15" vacuum. Made trip to unplug bit and bottom drill collar at 1178' and cleaned out 4' fill.
- 08-29-84 Drilled 17-1/2" hole from 1183' to 1191' with 35/45 rpm, 5/7,000# wt. on bit, 14/16" vacuum. Ran Sperry Sun gyroscopic survey in and out using Birdwell equipment. Reamed tight hole from 1146' to fill at 1183'. Cleaned out fill to 1188'. Made trip inspecting joints and seals, changed bit, and tagged fill at 1186'.
- 08-30-84 Cleaned out 5' fill. Drilled 17-1/2" hole from 1191' to 1202' with 35/45 rpm, 3/20,000# wt. on bit, using 14/17" vacuum. Drilling was secured from 0700 hours to 0900 hours. Hole sloughed during drilling.

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- 08-31-84 Drilled 17-1/2" hole from 1202' to 1220' with 35/45 rpm, 10/20,000# wt. on bit, using 14/16" vacuum. Made trip out, bit and drill collars plugged up with cuttings. Ran Sandia TV camera to 1234' T.D., 1% error factor in footage counter. Ran Birdwell caliper log to 1219' T.D. Cleaned out drill collars and changed bit. Replaced bottom broken inner string joint with #6 11" drill collar. Made trip in and landed tools in 20" casing. Secured rig for weekend and holiday at 2400 hours.
- 09-04-84 Rig secured from 08-31-84 to 09-04-84. Lowered tools and cleaned out 6' fill. Drilled 17-1/2" hole from 1220' to 1264' with 35/45 rpm, 10/20,000# wt. on bit, using 14/17" vacuum. Cleaned out 3' fill at 1232' and 1' fill at 1256'.
- 09-05-84 Drilled 17-1/2" hole from 1264' to 1304' with 35/45 rpm, 10/20,000# wt. on bit, 14/16" vacuum. Hole continued sloughing. Conditioned hole and made trip out. First 2 joints of inner string above drill collars had parted. Unplugged all 6 drill collars.
- 09-06-84 Replaced the 2 inner string joints, changed bit, made trip in, and cleaned out 8' fill. Drilled 17-1/2" hole from 1304' to 1337' with 35/45 rpm, 15/20,000# wt. on bit, using 15/16" vacuum.
- 09-07-84 Drilled 17-1/2" hole from 1337' to 1378' with 35/45 rpm, 15/20,000# wt. on bit, using 14/16" vacuum. Hole continued sloughing. Made trip out visually inspecting each joint, inner string parted at center of joints #1, #2, and #3 of 8-5/8" outer string drill pipe. Inner string drill collar #4 (11") had parted 7' below box. Secured rig for weekend.
- 09-10-84 Rig secured from 09-07-84 to 09-10-84. Laid down #3 drill collar with parted inner string and unplugged #1 and #2 drill collars. Changed bit, made trip in, and cleaned out 1' fill. Drilled 17-1/2" hole from 1378' to 1397' with 35/45 rpm, 15/20,000# wt. on bit, using 14/15" vacuum. Made trip to unplug tools. Inner string had parted in #2 drill collar. Unplugged bottom drill collar and bit.
- 09-11-84 Changed bit, made trip in, and cleaned out 8' fill. Drilled 17-1/2" hole from 1397' to 1457' with 35/45 rpm, 5/15,000# wt. on bit, using 15/16" vacuum. Hole continued sloughing.
- 09-12-84 Drilled 17-1/2" hole from 1457' to 1562' with 30/45 rpm, 1/15,000# wt. on bit, using 15/18" vacuum. Hole continued sloughing.
- 09-13-84 Drilled 17-1/2" hole from 1562' to 1585' with 25/40 rpm, 3/5,000# wt. on bit, using 15-1/2/16" vacuum. Made trip out inspecting tool joints and inner string, inner string broken in joint #7 and replaced joint. Unplugged 5 joints of drill pipe and 3 drill

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- 09-13-84
(Cont.) collars. Changed bit, made trip in with 6 drill collars, and cleaned out 1' fill. Drilled 17-1/2" hole from 1585' to 1590' with 30/40 rpm, 3/5,000# wt. on bit, using 15/16" vacuum. Hole sloughed at 1590'.
- 09-14-84 Drilled 17-1/2" hole from 1590' to 1633' with 40/45 rpm, 3/25,000# wt. on bit, using 15/18" vacuum. Pulled tools up into 20" casing and secured rig at 2400 hours for weekend.
- 09-17-84 Rig secured from 09-14-84 to 09-17-84. Made trip out. Cleaned out damp packed cuttings in drill collars and changed bit. Made trip in inspecting each joint and cleaned out 1' fill. Drilled 17-1/2" hole from 1633' to 1665' with 40 rpm, 3/5,000# wt. on bit, using 14/16" vacuum.
- 09-18-84 Drilled 17-1/2" hole from 1665' to 1769' with 35/45 rpm, 2/10,000# wt. on bit, using 14/16" vacuum.
- 09-19-84 Drilled 17-1/2" hole from 1769' to 1823' with 35/45 rpm, 5/10,000# wt. on bit, using 14/16" vacuum. Laid down drill pipe and drill collars. Replaced the six 11" drill collars.
- 09-20-84 Made trip in with 17-1/2" bit and six 11" drill collars on single string 6-5/8" drill pipe and cleaned out 1' fill. Drilled 17-1/2" hole from 1823' to 1826', hole sloughed in on tools. Worked tools free with 40,000# pull over string weight and cleaned out fill. Drilled 17-1/2" hole from 1826' to 1828' with 35/50 rpm, 3/30,000# wt. on bit, using 14/16" vacuum.
- 09-21-84 Made trip for bit change and changed to 5-1/2" inner string drill pipe. Cleaned out 4' fill and drilled 17-1/2" hole from 1828' to 1837' with 35/50 rpm, 3/25,000# wt. on bit, using 15/18" vacuum. Pulled tools up into casing and secured rig for weekend at 2400 hours.
- 09-24-84 Rig secured from 09-21-84 to 09-24-84. Lowered tools and cleaned out 1' fill. Drilled 17-1/2" hole from 1837' to 1839' with 35/45 rpm, 3/5,000# wt. on bit, using 16/18" vacuum. Attempted to unplug tools using 20' of HCQ rods on a sandline. Made trip out, bit not plugged but appeared to have been balled with mud. Modified bit, cutting openings in bit skirt and extending nozzle. Made trip in, tools still plugged using 20/23" vacuum. Made trip out, bottom 240' of tools were damp, 1 bit cone was locked. Cleaned out top 8' of #1 drill collar. Ran SNL black and white TV camera. Cleaned out #2 drill collar using fabricated 3/4" air line and 3-1/2" pipe with saw teeth welded on bottom of 4-1/2" O.D. pipe. Cuttings in drill collar were damp and packed.

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- 09-25-84 Completed cleaning out #2 drill collar. Made trip in and cleaned out 2' fill. Drilled 17-1/2" hole from 1839' to 1874' with 30/50 rpm, 2/20,000# wt. on bit, using 14/16" vacuum. Formation change indicated at 1868'.
- 09-26-84 Drilled 17-1/2" hole from 1874' to 1887' with 35/45 rpm, 5/10,000# wt. on bit, using 16/18" vacuum. Tools stuck for connection at 1887'. Worked tools free with 320,000# pull while rotating drill pipe. Made trip out, bottom 3 drill collars were plugged. Ran Birdwell fluid density log to 1862' T.D., no fluid indicated. Ran caliper and induction logs to 1858' T.D.
- 09-27-84 Made trip in with 17-1/2" bit and 4 drill collars. Cleaned out fill from 1857' to 1861'. Ran Eastman gyroscopic survey to 1834' on 25' stations using Birdwell equipment. Made trip out. Ran Westech black and white TV camera to 1855'. Attempted to run color TV camera, picture not clear. Ran Birdwell temperature- gamma ray log to 350', changed orders. Ran Dresser Atlas dielectric log to 1858' T.D.
- 09-28-84 Ran gamma ray spectrum and compensated density logs to 1858' T.D. Ran Birdwell epithermal neutron and gamma ray-temperature logs to 1854' T.D., maximum temperature was 113.2° F. Attempted to run magnetometer log, tool not working properly. Drained equipment and secured rig at 2400 hours.
- 09-29-84 Rig secured to 1500 hours. Ran USGS magnetic susceptibility log to 1850' T.D.
- 09-30-84 Ran magnetic susceptibility log, log no good due to high wind causing static.
- 10-01-84 Ran magnetic susceptibility log from 1850' to 344'. Rig secured at 2400 hours.
- 10-02-84 Construction covered hole with water proof tarpaulin.
- 10-04-84 Rig secured from 10-02-84 to 0945 hours, 10-04-84. Ran Birdwell vibroseis survey to 1855' T.D., logged from 1840' to 335' on 50' stations. Ran LLNL proton magnetometer log on Birdwell equipment from 1850' to 1092', tool quit working. Secured rig at 1700 hours.
- 10-12-84 Rig secured from 10-04-84 to 1000 hours, 10-12-84. Construction moved out Gardner-Denver vacuum pump. Secured rig at 1030 hours.
- 10-24-84 Rig secured from 10-12-84 to 1030 hours, 10-24-84. Ran USGS magnetometer log in and out to 1850'. Secured rig at 2000 hours.

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- 11-13-84 Rig secured from 10-24-84 to 0930 hours, 11-13-84. Ran Westech color TV camera to 1850'. Secured rig at 1400 hours.
- 01-16-85 Rig secured from 11-13-84 to 1000 hours, 01-16-85. Ran Westech color TV camera to 1851', hard hat dropped in hole on 11-13-84 was indicated. Approximately 4" of fill was also indicated. Rig secured at 1215 hours.
- 04-22-86 Rig secured from 01-16-85 to 04-22-86. Started rigging down.
- 04-23-86 Started laying down 6-5/8" drill pipe and moving out equipment.
- 04-24-86 Rigged down and moved out equipment.
- 04-25-86 Continued moving out equipment.
- 04-28-86 Equipment moving operation secured for weekend from 04-25-86 to 04-28-86. Continued moving out equipment. Hole suspended.

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Deviation Survey

<u>Date</u>	<u>Depth</u>	<u>Deviation</u>
06-20-84	119'	00 30'
06-22-84	275'	10 00'
08-01-84	394'	00 25'
08-02-84	492'	00 05'
08-03-84	568'	00 00'
08-06-84	728'	00 30'
	760'	00 15'
08-07-84	778'	00 25'
08-09-84	819'	00 16'
08-20-84	841'	00 30'
08-21-84	873'	00 15'
	905'	00 16'
08-22-84	937'	00 25'
	1001'	00 17'
08-23-84	1001'	00 15'
	1065'	00 45'
	1065'	00 30'
08-24-84	1097'	00 30'
08-27-84	1133'	00 45'
08-28-84	1166'	00 45'
08-29-84	1170'	00 40'
08-31-84	1220'	00 58'
09-04-84	1256'	10 00'
09-05-84	1288'	00 55'
09-06-84	1320'	00 45'
09-10-84	1392'	00 45'
09-11-84	1426'	10 05'
09-12-84	1490'	00 55'
	1553'	10 00'
09-14-84	1609'	00 43'
09-18-84	1673'	00 47'
	1736'	00 55'
09-19-84	1800'	00 40'
09-25-84	1856'	00 45'

USW UZ-6
REVIEW OF HOLE CONDITIONS

660 mm (26") casing was set at 12.2 m (40') in a 762 mm (30") hole drilled to 12.2 m (40') with hammer drill using air. The annulus was cemented to the surface with 5.35 m³ (189 ft³) of Redi-Mix cement. Calculated annular volume was 1.13 m³ (40 ft³). 508 mm (20") casing was set at 98.8 m (324') in a 610 mm (24") hole drilled to 103.9 m (341') using dual and single string drilling with reverse vacuum circulation. Hole and casing were cemented in 3 stages between 100.9 m (331') and 98.1 m (322') with 11.61 m³ (410 ft³) of neat cement, 136 kg (300 lbs.) of D-19 friction reducer, and 997.9 kg (2200 lbs.) of gilsonite. Calculated volume was 1.16 m³ (41 ft³). 445 mm (17-1/2") hole was drilled to 237.1 m (778') using vacuum drilling. TV camera, caliper, temperature-gamma ray, epithermal neutron, and formation density logs were run 08-07-84 and 08-08-84. The average curve on caliper log run #1 indicated an eroded zone below 508 mm (20") casing to 113.4 m (372') with maximum hole enlargement to 972 mm (38-1/4") at 104.9 m (344') and some erosion to log T.D. at 234.7 m (770') with hole enlargements to 743 mm (29-1/4") at 156.4 m (513') and 933 mm (36-3/4") at 183.8 m (603'). 445 mm (17-1/2") hole was then drilled to 575.2 m (1887'), 09-26-84. Gyroscopic survey was run 08-29-84. TV camera and caliper log were run 08-31-84. The average curve on caliper run #2 to 371.6 m (1219') T.D. indicated little change to 234.7 m (770') and eroded zones to 336.2 m (1103') with maximum hole enlargements to 857 mm (33-3/4") at 262.7 m (862') and 927 mm (36-1/2") at 309.1 m (1014'). Fluid density, caliper, induction, temperature-gamma ray, dielectric, gamma ray spectrum, compensated density, epithermal neutron, gamma ray-temperature, magnetic susceptibility logs, TV camera, gyroscopic survey and vibroseis survey, logged from 560.8 m (1840') to 102.1 m (335') on 15.2 m (50') stations, were run between 09-26-84 and 10-04-84. The average curve on caliper log run #3 to 566.3 m (1858') T.D. indicated no increased erosion in previously logged hole, eroded zones between 374.9 m (1230') and 423.7 m (1390') with maximum hole enlargement to 737 mm (29") at 397.2 m (1303'), and eroded zones from 431.6 m (1416') to 520.0 m (1706') and from 553.5 m (1816') to 554.7 m (1820'). Magnetometer log was run 10-24-84. TV camera was run on 11-13-84 and 01-16-85. Hole was suspended indefinitely 04-28-86.

FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI

Approved: *Jerry Ted Covington*
 Date: *May 1, 1987*

Hole No.: USW UZ-6s		Type Hole: Unsaturated Zone Test Hole						
User: USGS	Area: Off-Site	Site Prep. W.O. #: None						
Location: NTS	County: Nye	W.O. #: 3404-208						
Surface Coordinates: N 759,909.3' E 558,050.4'								
Ground Elev.: 4949.2'	Pad Elev.:	Top Casing Elev.:						
Bottom Hole Coord: Not Surveyed @		Ref:						
Rig On Location: 04-16-85	Spudded: 04-23-85	Completed: 09-09-85						
Circulating Media: ODEX 165								
Main Rig & Contractor: CP Rig/REECO								
No. Of Compressors & Capacity: 1/GD 900, 1-2/Atlas 1200								
Bore Hole Record		Casing Record						
From	To	Size	O.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	494.5'	8-11/32"	7-5/8"	26#		0'	3'	*
494.5'	519'	3.990"						
Total Depth: 519'		Plugs: None						
Junk: None								
Logging Data: None								

Rigs Used						
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location
85128	CP Rig	IV	14.67		42.66	57.33
85173	Joy #2	VIII	2.43	0.23	5.67	8.33

Remarks: * Casing welded to plate at surface.

Prepared By: LLF:ps Time Breakdown on Next Page

USW UZ-6s
HOLE HISTORY

- 04-16-85 Moved CP rig #85128 on location and rigged up. Laid down 4 joints of drill pipe and removed lazy susan. Rigged down and moved out.
- 04-22-85 Hole suspended from 04-16-85 to 0800 hours, 04-22-85. Moved in CP rig #85128 and rigged up to drill using ODEX 165 system.
- 04-23-85 Drilled 8-11/32" hole from 0' to 56' cased with 7-5/8", 26#, J-55, Ventura thd. casing using ODEX 165 system. Hole not cleaning up very good at 56'.
- 04-24-85 Drilled 8-11/32" hole from 56' to 76' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel. Cut 3.937" core #1 from 76' to 78'. Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 76' to 78' and drilled 8-11/32" hole to 96' cased with 7-5/8" casing.
- 04-25-85 Made trip for HCQ core bit and barrel. Cut 3.937" core #2 from 96' to 98'. Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 96' to 98' and drilled 8-11/32" hole to 116'. Made trip for HCQ core bit and barrel. Cut 3.937" core #3 from 116' to 118'.
- 04-26-85 Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 116' to 118' and drilled 8-11/32" hole to 136' cased with 7- 5/8" casing. Made trip for HCQ core bit and barrel. Cut 3.937" core #4 from 136' to 138'. Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 136' to 138' and drilled 8-11/32" hole to 156' cased with 7-5/8" casing. Secured rig for weekend.
- 04-29-85 Rig secured from 04-26-85 to 04-29-85. Opened hammer choke to 1/4". Cut 3.937" core #5 from 156' to 158'. Attempted to remove hammer bit to change reamer. Welder fabricated a special tool wrench.
- 04-30-85 Completed fabricating special wrench. Removed 8-11/32" bit, changed reamer, and replaced bit. Opened 3.937" hole to 8-11/32" from 156' to 158' and drilled 8-11/32" hole to 164', hole not cleaning up. Air pressure dropped approximately 40 psi due to larger choke. Replaced GD-900 compressor with 2 Atlas-1200 compressors.
- 05-01-85 Rigged up Atlas 1200 compressors. Drilled 8-11/32" hole from 164' to 176' cased with 7-5/8" casing, hole cleaned up good due to increased air. Made trip for HCQ core bit and barrel. Cut 3.937" core #6 from 176' to 177'. Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 176' to 177' and drilled 8-11/32" hole to 196' cased with 7-5/8" casing.

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- 05-02-85 Made trip for HCQ core bit and barrel. Cut 3.937" core #7 from 196' to 198'. Made trip for Odex 165 system. Opened 3.937" hole to 8-11/32" from 196' to 198' and drilled 8-11/32" hole to 216' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel. Repaired breakout wrench.
- 05-03-85 Cut 3.937" core #8 from 216' to 218'. Made trip for ODEX 165 system. Opened 3.937" hole to 8-11/32" from 216' to 218' and drilled 8-11/32" hole to 240' cased with 7-5/8" casing. Made trip out, rigged down, and moved out. Hole suspended.
- 05-09-85 Hole suspended from 05-03-85 to 0800 hours, 05-09-85. Moved in CP rig #85128 and rigged up.
- 05-10-85 Drilled 8-11/32" hole from 240' to 256' cased with 7-5/8", 26# casing using ODEX 165 system. Made trip for HCQ core bit and barrel. Cut 3.937" core #9 from 256' to 258'. Serviced core barrel and secured rig for weekend.
- 05-13-85 Rig secured from 05-10-85 to 05-13-85. Opened core hole and drilled 8-11/32" hole from 256' to 276' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel. Cut 3.937" core #10 from 276' to 278'. Made trip for ODEX tools. Opened core hole and drilled 8-11/32" hole from 276' to 296' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel.
- 05-14-85 Cut 3.937" core #11 from 296' to 297'. Changed reamer shell. Cut 3.937" core #12 from 297' to 297.2'. Serviced core barrel.
- 05-15-85 Opened 3.937" hole and drilled 8-11/32" hole from 296' to 316' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel. Cut 3.937" core #13 from 316' to 318'. Made trip for ODEX tools.
- 05-16-85 Opened 3.937" hole and drilled 8-11/32" hole from 316' to 336' cased with 7-5/8" casing, bit unscrewed from hammer. Attempted to screw back on bit. Started fabricating a wireline impression block.
- 05-17-85 Ran impression block, tool indicated reamer upright. Ran TV camera. Ran taper tap and fabricated tap, no recovery. Reran impression block. Modified fabricated tap and recovered reamer, bit still in hole. Secured rig for weekend.
- 05-20-85 Attempted to fish bit with 5-3/4" overshot and 3" grapple, no recovery. Modified overshot to 6-1/4" and recovered fish. Made trip with HCQ core bit and barrel. Cut 3.937" core #14 from 336' to 338'.

- 05-21-85 Made trip for ODEX 165 system. Opened 3.937" hole and drilled 8-11/32" hole from 336' to 356'. Blew out hole using 250 psi air and made trip for HCQ core bit and barrel. Cut 3.937" core #15 from 356' to 357'.
- 05-22-85 Completed core #15 from 357' to 358'. Made trip for ODEX 165 system. Opened 3.937" hole and drilled 8-11/32" hole from 356' to 376' cased with 7-5/8" casing. Blew out hole and made trip for HCQ core bit and barrel. Cut 3.937" core #16 from 376' to 377.5'.
- 05-23-85 Completed core #16 from 377.5' to 378'. Made trip for ODEX 165 system. Opened 3.937" hole and drilled 8-11/32" hole from 376' to 396' cased with 7-5/8" casing. Made trip for HCQ core bit and barrel. Cut 3.937" core #17 from 396' to 401'. Made trip for ODEX 165 system.
- 05-24-85 Laid down ODEX 165 system tools. Made trip in with HCQ core bit and barrel. Cut 3.990" cores #18 thru #24 from 401' to 433'. Secured rig for weekend and holiday.
- 05-28-85 Rig secured from 05-24-85 to 0800 hours, 05-28-85. Made trip for 4-1/4" CDP drag core bit and HCQ core barrel. Reamed hole from 396' to 433' and cut 4-1/4" cores #25 thru #29 to 457'.
- 05-29-85 Cleaned out 1' fill and cut 4-1/4" cores #30 thru #35 from 457' to 481'. Made trip for diamond HCQ core bit. Cut 3.990" core #36 from 481' to 483'.
- 05-30-85 Cleaned out 1.5' fill and cut 3.990" cores #37 thru #39 from 483' to 490.5'. Made trip out for new diamond core bit and worked on ODEX 165 drilling system.
- 05-31-85 Cleaned out 0.5' fill and cut 3.990" core #40 from 490.5' to 495'. Pulled tools up into casing and secured rig for weekend.
- 06-03-85 Rig secured from 05-31-85 to 06-03-85. Lowered tools to 495', no fill. Cut 3.990" cores #41 thru #43 from 495' to 509'.
- 06-04-85 Cut 3.990" cores #44 and #45 from 509' to 519'. Cleaned hole with air at 145 psi. Made trip for ODEX 165 system.
- 06-05-85 Opened 4-1/4" hole to 8-11/32" from 396' to 397' cased with 7-5/8" casing, new drive sub hanging in casing drive shoe. Attempted to break out top joint of drill pipe, rig hydraulic hose broke. Replaced hose.
- 06-06-85 Made trip to replace drive sub. Opened 4-1/4" hole to 8-11/32" from 397' to 456' cased with 7-5/8" casing.

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- 06-07-85 Opened 4-1/4" and 3.990" hole to 8-11/32" from 456' to 494.5' cased with 7-5/8" casing. 2-3/8" I.F. drill pipe box parted at 294'. Made trip for 3-1/2" grapple. Secured rig for weekend.
- 06-10-85 Rig secured from 06-07-85 to 0800 hours, 06-10-85. Latched on to fish using overshot with 3-1/2" grapple and made trip out, full recovery. Made trip in with ODEX 165 system. Cleaned out 2' fill using air, could not get past 492'. Made trip out, left drive sub, reamer, and bit in the hole. Made trip in with overshot, 3-1/2" grapple, 3-1/2" bumper sub and jar to 450'.
- 06-11-85 Worked over fish and made trip out, recovered 3" hammer sleeve. Changed to 3-3/8" grapple, made trip in, and worked over fish. Made trip out, no recovery. Ran TV camera to 490', good picture of fish. Made trip in with shortened overshot and 3-3/8" grapple and worked over fish. Made trip out with tools dragging, recovered fish. Moved out drill pipe and rods.
- 06-12-85 Rigged down and moved out. Set and leveled hydraulic casing jacks to pull 7-5/8" casing.
- 06-13-85 Moved in Joy #2, rig #85173. Completed setting up Foster hydraulic casing jacks. Jacked up 7-5/8" casing 1.5' with 150,000#, casing parted. Ran SNL TV camera to bottom of the casing, casing parted at 253'. Waited on orders from 1130 hours.
- 06-14-85 Attempted to screw casing back in, unable to rotate casing. Set Joy #2 rig over hole and rigged up. Pulled 1 joint of 7-5/8" casing using jacks at 50,000#, broke casing tongs. Secured rig for weekend.
- 06-17-85 Rig secured from 06-14-85 to 06-17-85. Jacked out and laid down 6 joints of 7-5/8" casing using 100/15,000# jack pull. Removed casing jacks and rigged up Joy #2 rig to pull casing. Laid down 5 joints of casing for a total of 220'.
- 06-18-85 Laid down 2 joints of 7-5/8" casing for a total of 13 joints 20' long. Made trip in with inside casing spear, Bowen mechanical jars, and bumper sub on 4-1/2" drill pipe to 253'. Worked tools to 361', unable to move casing and tools up or down. Moved in and rigged up 2 Atlas 1200 compressors.
- 06-19-85 Worked fishing tools out of casing and up hole to 140' using 43,000# pull and 100/250 psi. Tools freed and made trip out, spear was full of rocks. Laid down tools and cleaned location.
- 06-20-85 Waited on SNL TV camera equipment to 1130 hours. Ran TV camera to fill at 333'. Moved out 4-1/2" drill pipe.
- 06-21-85 Rigged down and moved out. Hole suspended.

USW UZ-6s
Hole History
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- 08-26-85 Hole suspended from 06-21-85 to 08-26-85. Moved in drilling equipment.
- 08-27-85 Continued locating and moving in equipment. (Work involves only day crew.)
- 08-28-85 Moved in CP rig #85128 and rigged up. Moved in 7-5/8" casing.
- 08-29-85 Rigged up to run casing. Ran and set 7-5/8" O.D. casing at top of fish at 253'. Joint #1 is a drive shoe joint. Rigged up air circulating head on 7-5/8" casing. Made trip in with 6-1/4" bit on 3-1/2" O.D. drill pipe to top of fill at 333'.
- 08-30-85 Cleaned out fill from 333' to 494' using 2 Atlas 1200 compressors with 180 psi. Laid down drill pipe. Gathered fishing tools. Secured rig for weekend and holiday.
- 09-03-85 Rig secured from 08-30-85 to 0800 hours, 09-03-85. Fabricated Tri-State Type B spear with safety joint, Bowen mechanical jars, and bumper sub. Made trip in with spear on 4-1/2" drill pipe to 494'. Set spear and attempted to jar fish, rig pulled only 19,000# above string weight. Rigged down and moved rig over. Rigged up hydraulic jacks over hole. Rigged up CP rig.
- 09-04-85 Started pulling 4-1/2" drill pipe with spear set at 494' using hydraulic jacks. No fish movement at 69,000#. At 216,000# started 4-1/2" drill pipe out of hole cutting off 7-5/8" casing in 7.5' sections. Total of 101' of 7-5/8" casing laid down. Last pull at 75,000# moved pipe.
- 09-05-85 Continued pulling 7-5/8" casing with up to 72,000# pull and cutting into 7.5' sections. Rigged down hydraulic jacks and rigged up CP rig. Continued pulling casing. Attempted to release spear, pipe would not release. Blew air down hole with 2 Atlas compressors. Had returns in 7-5/8" casing, none in the annulus. Worked pipe, spear would not release. Laid down 7 joints of 4-1/2" drill pipe along with 7-5/8" casing, 100' of 7-5/8" fish remained in hole. Secured rig.
- 09-06-85 Completed pulling 7-5/8" casing and 4-1/2" drill pipe, cutting off casing at drill pipe connections. Stripped bottom 12 joints of casing off the drill pipe. Laid down Tri State fishing tools. Ran SNL TV camera to fill at 449'. Started rigging down.
- 09-09-85 Operations secured from 09-06-85 to 09-09-85. Installed 4' section of 7-5/8" casing 3' in the hole with plate at surface welded to casing. Sandbags were placed around the casing and locking cap welded on top of casing. Rigged down and moved out. Hole completed 09-09-85.
- 09-10-85 Completed moving out equipment.

**USW UZ-6s
CORE RECORD**

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	76.0 - 78.0	2.0	1.7	85
2	96.0 - 98.0	2.0	2.0	100
3	116.0 - 118.0	2.0	2.0	100
4	136.0 - 138.0	2.0	2.0	100
5	156.0 - 158.0	2.0	2.0	100
6	176.0 - 177.0	1.0	1.0	100
7	196.0 - 198.0	2.0	2.0	100
8	216.0 - 218.0	2.0	2.0	100
9	256.0 - 258.0	2.0	2.0	100
10	276.0 - 278.0	2.0	2.0	100
11	296.0 - 297.0	1.0	0.9	90
12	297.0 - 297.2	0.2	0.0	0
13	316.0 - 318.0	2.0	1.9	95
14	336.0 - 338.0	2.0	1.8	90
15	356.0 - 358.0	2.0	1.4	70
16	376.0 - 378.0	2.0	1.7	85
17	396.0 - 401.0	5.0	5.0	100
18	401.0 - 406.0	5.0	5.0	100
19	406.0 - 411.0	5.0	5.0	100
20	411.0 - 416.0	5.0	5.0	100
21	416.0 - 421.0	5.0	5.0	100
22	421.0 - 426.0	5.0	4.0	80
23	426.0 - 429.0	3.0	2.0	67
24	429.0 - 433.0	4.0	5.0	125
25	433.0 - 438.0	5.0	5.0	100
26	438.0 - 442.0	4.0	5.0	125
27	442.0 - 447.0	5.0	2.5	50
28	447.0 - 452.0	5.0	1.8	36
29	452.0 - 457.0	5.0	4.2	84
30	457.0 - 462.0	5.0	3.5	70
31	462.0 - 466.0	4.0	3.2	80
32	466.0 - 471.0	5.0	2.1	42
33	471.0 - 475.0	4.0	1.5	38
34	475.0 - 480.0	5.0	0.0	0
35	480.0 - 481.0	1.0	0.2	20
36	481.0 - 483.0	2.0	2.0	100
37	483.0 - 487.0	4.0	3.4	85
38	487.0 - 489.5	2.5	2.1	84
39	489.5 - 490.5	1.0	1.15	115
40	490.5 - 495.0	4.5	4.5	100
41	495.0 - 500.0	5.0	5.0	100
42	500.0 - 505.0	5.0	3.5	70
43	505.0 - 509.0	4.0	5.0	125
44	509.0 - 514.0	5.0	5.0	100
45	514.0 - 519.0	5.0	5.0	100

USW UZ-6s
REVIEW OF HOLE CONDITIONS

212 mm (8-11/32") hole cased with 194 mm (7-5/8") casing was drilled to a depth of 150.7 m (494.5') using the Odex 165 system. During drilling, 100 mm (3.937"), 108 mm (4-1/4"), and 101 mm (3.990") cores were cut to a total depth of 158.2 m (519') for a total of 45 cores. On 06-13-85, 194 mm (7-5/8") casing parted at 77.1 m (253') during attempt to pull out of hole. Casing was recovered 09-06-85. A 1.2 m (4') section of 194 mm (7-5/8") casing was set in hole at 0.9 m (3') and welded to a plate at the surface. Sandbags were placed around the casing and locking cap welded on top of casing. Hole completed 09-09-85.

USW UZ-7
HOLE HISTORY

- 01-02-85 Started moving equipment to location.
- 01-03-85 Moved in Joy #2, rig #85173, and started rigging up.
- 01-04-85 Rigged up. Drilled 6" hole from 0' to 31' cased with 5-1/2" O.D., 1/4" wall casing using ODEX 115 system. Took hammer spoon samples from 5' to 7', 10' to 12', 15' to 17', and 20' to 22'. Relevelled rig and secured rig for weekend.
- 01-07-85 Rig secured from 01-04-85 to 01-07-85. Drilled 6" hole from 31' to 37' cased with 5-1/2" casing. Cut 4-1/4" x 2-1/4" core #1 from 37' to 38' using HCQ wire line core barrel and diamond core bit. Reamed and drilled 6" hole from 37' to 47' cased with 5-1/2" casing. Cut HCQ core #2 from 47' to 49.3'. Attempted to cut core #3, 0.2' piece of core #2 jammed core barrel. Reamed hole to 6" from 47' to 49' cased with 5-1/2" casing.
- 01-08-85 Reamed and drilled 6" hole from 49' to 61' cased with 5-1/2" casing. Cut HCQ core #3 from 61' to 62'. Reamed and drilled 6" hole from 61' to 72'. Cut HCQ core #4 from 72' to 73'. Reamed hole to 6" from 72' to 73' cased with 5-1/2" casing.
- 01-09-85 Drilled 6" hole from 73' to 84' cased with 5-1/2" casing. Cut HCQ core #5 from 84' to 86'. Reamed and drilled 6" hole from 84' to 92' cased with 5-1/2" casing. Hydraulic control valve broke at 1400 hours.
- 01-10-85 Worked on rig hydraulic system.
- 01-11-85 Worked on rig hydraulic system to 1100 hours. Cut HCQ cores #6 thru #8 from 92' to 102'. Secured rig for weekend.
- 01-14-85 Rig secured from 01-11-85 to 01-14-85. Cut HCQ cores #9 thru #13 from 102' to 121'.
- 01-15-85 Reamed and drilled 6" hole from 92' to 122' cased with 5-1/2" casing. Cut HCQ cores #14 thru #18 from 122' to 144.8'.
- 01-16-85 Cut HCQ cores #19 thru #24 from 144.8' to 173.3'. Reamed hole to 6" from 122' to 137' cased with 5-1/2" casing.
- 01-17-85 Reamed hole to 6" from 137' to 172' cased with 5-1/2" casing. Cleaned bottom of hole and cut HCQ cores #25 thru #28 from 173.3' to 177.5'. Formation hard, went to sub dock for small diamond core bit.
- 01-18-85 Cut HCQ cores #29 and #30 from 177.5' to 181.1'. Reamed and drilled 6" hole from 172' to 185' cased with 5-1/2" casing. Changed damaged core bit and cut HCQ core #31 from 185' to 190'. Secured rig for weekend.

USW UZ-7
Hole History
Page 2

- 01-21-85 Rig secured from 01-18-85 to 01-21-85. Cut HCQ cores #32 thru #34 from 190' to 200'. Reamed and drilled 6" hole from 185' to 207' cased with 5-1/2" casing.
- 01-22-85 Laid down drilling tools. Pulled and landed 5-1/2" casing at 30' consisting of stainless steel 7' shoe joint, 2 joints of stainless steel 5' x 5-1/2" casing and 3 joints of steel 5' x 5-1/2" casing in the hole. Moved out rig and equipment. Hole completed 01-22-85.
- 01-23-85 Completed moving out equipment.
- 02-20-85 Ran Westech TV camera to 20', camera did not work. Reran camera to 37', could not get deeper, and camera still not working.
- 02-21-85 Ran Westech TV camera to boulder obstructing borehole at 37'.
- 09-10-85 Moved in Joy #2, rig #85173 and equipment.
- 09-11-85 Rigged up. Made trip in and cleaned out hole from 33' to 72' cased with 5-1/2", 14# casing using ODEX 115 system and air. Made trip out. Pulled casing up to 20', leaving 2' above surface and secured.
- 09-12-85 Made trip in with 3-3/4" bit and tagged fill at 178'. Cleaned out hole to 207' using air. Pulled up for fill check, tagged fill at 201'. Made trip out and rigged down.
- 09-13-85 Rigged down and moved out.
- 03-18-86 Ran Westech 3-1/2" O.D. color TV camera to 22', could not get deeper.

USW UZ-7
CORE RECORD

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	37.0 - 38.0	1.0	1.2	120
2	47.0 - 49.3	2.3	1.0	43
3	61.0 - 62.0	1.0	1.0	100
4	72.0 - 73.0	1.0	0.0	0
5	84.0 - 86.0	2.0	0.0	0
6	92.0 - 95.0	3.0	2.8	93
7	95.0 - 98.0	3.0	2.9	97
8	98.0 - 102.0	4.0	4.0	100
9	102.0 - 105.0	3.0	3.0	100
10	105.0 - 110.0	5.0	4.8	96
11	110.0 - 115.0	5.0	4.85	97
12	115.0 - 120.0	5.0	5.0	100
13	120.0 - 121.0	1.0	1.0	100
14	122.0 - 127.2	5.2	5.2	100
15	127.2 - 131.5	4.3	4.3	100
16	131.5 - 136.2	4.7	4.7	100
17	136.2 - 141.4	5.2	4.9	94
18	141.4 - 144.8	3.4	3.4	100
19	144.8 - 149.9	5.1	5.1	100
20	149.9 - 155.1	5.2	5.2	100
21	155.1 - 160.0	4.9	4.9	100
22	160.0 - 165.2	5.2	5.2	100
23	165.2 - 170.4	5.2	5.2	100
24	170.4 - 173.3	2.9	2.9	100
25	173.3 - 173.8	0.5	0.5	100
26	173.8 - 174.3	0.5	0.5	100
27	174.3 - 176.8	2.5	2.5	100
28	176.8 - 177.5	0.7	0.7	100
29	177.5 - 180.6	3.1	3.1	100
30	180.6 - 181.1	0.5	0.5	100
31	185.0 - 190.0	5.0	0.0	0
32	190.0 - 193.9	3.9	3.9	100
33	193.9 - 196.6	2.7	2.7	100
34	196.6 - 200.0	3.4	3.0	88

USW UZ-7
REVIEW OF HOLE CONDITIONS

152 mm (6") hole cased with 140 mm (5-1/2") casing was drilled to a total depth of 63.1 m (207') using ODEX 115 system. A total of thirty-four 108 mm (4.25") cores were taken during drilling. 140 mm (5-1/2") casing was pulled and set at 9.1 m (30'). Hole was completed 01-22-85. TV camera was run to boulder obstructing borehole at 11.3 m (37'), 02-21-85. Fill was cleaned out and 140 mm (5-1/2") casing was pulled up to 6.1 m (20'), 09-12-85. TV camera was run to 6.7 m (22'), could not get deeper 03-18-86.

**FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI**

Approved: *Jerry A. Covington*
Date: *May 1, 1987*

Hole No.: USW UZ-8		Type Hole: Unsaturated Zone Test Hole	
User: USGS	Area: Off Site	Site Prep. W.O. #: None	
Location: NTS	County: Nye	W.O. #: 3404-214	
Surface Coordinates: N 760,762.2' E 562,293.5'			
Ground Elev.: 4227.0'	Pad Elev.:	Top Casing Elev.: 4228.7'	
Bottom Hole Coord: Not Surveyed		@	Ref:
Rig On Location:	Spudded: 03-05-86	Suspended: 04-21-86	
Circulating Media: ODEX 115 System - Air			
Main Rig & Contractor: Hycalog #1/REECo			
No. Of Compressors & Capacity: 1/GD 900			

Bore Hole Record			Casing Record					
From	To	Size	I.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	55'	6"	5"	13.6#		0'	55'	None
55'	57'	4.25"						

Total Depth: 57' Plugs: None
Junk: None
Logging Data: None

Rigs Used							
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location	
85118	Hycalog #1	V	6.33	0.33	47.67	54.33	

Remarks:

Prepared By: JW:LLF:ps Time Breakdown on Next Page

USW UZ-8
HOLE HISTORY

- 02-26-86 Moved in CME 550, rig #85136.
- 02-27-86 Moved in Hycalog #1, rig #85118, and started rigging up using equipment from CME 550 rig.
- 02-28-86 Continued rigging up using equipment from CME 550 rig. Secured rig for weekend.
- 03-03-86 Rig secured from 02-28-86 to 03-03-86. Continued rigging up.
- 03-04-86 Continued rigging up and installing safety equipment.
- 03-05-86 Rigged up. Drilled 6" hole from 0' to 4' cased with 5-1/2", 13.6# casing using ODEX 115 system and air. Repaired power swivel and strung up sandline and catline.
- 03-06-86 Drilled 6" hole from 4' to 36' cased with 5-1/2" casing and took two drive core samples as directed by USGS, bit parted from tools at 36'. Cut first core (geologist's core record #3) from 16' to 18' and second core (geologist's core record #4) from 26' to 28' using 4.25" x 2.40" diamond core bit, 5' HCQ barrel, and air.
- 03-07-86 Recovered 6" ODEX bit using a tapered tap. Cut third core (geologist's core record #5) from 36' to 39'. Made up new 6" ODEX 115 tools, opened 4.25" hole and drilled 6" hole to 55'. Cut forth core (geologist's core record #6) from 45' to 47' and fifth core (geologist's core record #7) from 55' to 57'. Pulled casing to 35' and redrilled 6" hole to 55' cased with 5-1/2" casing. Secured rig for weekend.
- 03-10-86 Rig secured from 03-07-86 to 03-10-86. Crew on standby as directed by DOE.
- 03-11-86 Crew on standby as directed and worked on ODEX equipment at Area 25 subdock.
- 03-12-86 Crew on standby as directed and worked on equipment at Area 25 subdock.
- 03-13-86 Crew on standby as directed and worked on equipment at Area 25 subdock.
- 03-14-86 Crew on standby as directed and worked on equipment at Area 25 subdock. Secured rig for weekend.
- 03-17-86 Rig secured from 03-14-86 to 03-17-86. Crew on standby as directed and worked on equipment at Area 25 subdock.
- 03-18-86 Crew on standby as directed and worked on safety equipment on rig and at Area 25 subdock.
- 03-19-86 Crew on standby as directed and performed general area maintenance.

USW UZ-8
Hole History
Page 2

- 03-20-86 Crew on standby as directed and performed general area maintenance.
- 03-21-86 Crew on standby as directed and performed general area maintenance.
Secured rig for weekend.
- 03-26-86 Rig secured from 03-21-86 secured from 03-26-86. Moved out ODEX
115 support equipment and secured rig on location at 1100 hours.
Hole suspended.
- 04-18-86 Hole suspended from 03-26-86 to 1200 hours, 04-18-86 with rig
secured on location. Moved out rig and equipment.
- 04-21-86 Location secured from 04-18-86 to 04-21-86. Completed moving out
equipment. Hole suspended 04-21-86.

USW UZ-8
CORE RECORD

<u>Drive *</u> <u>Sample #</u>	<u>Core No.</u>	<u>Interval</u>	<u>Footage</u> <u>Cored</u>	<u>Footage</u> <u>Recovered</u>	<u>%</u> <u>Recovery</u>
1		4.0 - 6.0	2.0	2.0	100
2		11.0 - 12.0	1.0	1.0	100
	3	16.0 - 18.0	2.0	1.5	75
	4	26.0 - 28.0	2.0	1.0	50
	5	36.0 - 39.0	3.0	2.4	80
	6	45.0 - 47.0	2.0	0.8	40
	7	55.0 - 57.0	2.0	1.7	85

* Drive sample data obtained from USGS records.

USW UZ-8
REVIEW OF HOLE CONDITIONS

152 mm (6") hole cased with 140 mm (5-1/2") casing was drilled to 16.8 m (55') using ODEX 115 system. Drive core samples and a total of five 108 mm (4.25") cores were cut during drilling. Hole suspended 04-21-86.

FENIX & SCISSON, INC.
HOLE HISTORY DATA
NNWSI

Approved: Jerry Spill Covington
 Date: May 1, 1987

Hole No.: USW UZ-13		Type Hole: Unsaturated Zone Test Hole	
User: USGS	Area: Off Site	Site Prep. W.O. #: None	
Location: NTS	County: Nye	W.O. #: 3404-207	
Surface Coordinates: N 751,953.2' E 558,488.7'			
Ground Elev.: 4815.8'	Pad Elev.:	Top Casing Elev.: 4817.8'	
Bottom Hole Coord: Not Surveyed		@	Ref:
Rig On Location: 01-22-85	Spudded: 01-24-85	Completed: 04-19-85	
Circulating Media: ODEX 115			
Main Rig & Contractor: Joy #2/REECO			
No. Of Compressors & Capacity: 1/GD 900			

Bore Hole Record				Casing Record				
From	To	Size	I.D.	Wt/Ft.	Wall	From	To	Ft ³ Cement
0'	410'	6"	5"		1/4"	0'	330'	None
410'	430'	3.937"						

Total Depth: 430' Plugs: None
 Junk: None
 Logging Data: None

Rigs Used						
Rig No.	Name	Class	Days Operating	Sec. W/Crew	Sec. W/O Crew	Total Days On Location
85173	Joy #2	XIII	13.19		73.96	87.15

Remarks:

Prepared By: LLF:ps Time Breakdown on Next Page

USW UZ-13
HOLE HISTORY

- 01-22-85 Moved in Joy #2, rig #85173 and started rigging up.
- 01-23-85 Rigged up rig and ODEX 115 system.
- 01-24-85 Drilled 6" hole from 0' to 12' cased with 5-1/2" O.D., 1/4" wall casing using ODEX 115 system. Cut HCQ core #1 from 12' to 13.5' using 4.25" x 2.25" HCQ core bit and wire line barrel. Reamed and drilled 6" hole from 12' to 22' cased with 5-1/2" casing. Cut HCQ core #2 from 22' to 24'. Reamed and drilled 6" hole from 22' to 32' cased with 5-1/2" casing. Cut HCQ core #3 from 32' to 32.5'. Reamed and drilled 6" hole from 32' to 40' cased with 5-1/2" casing.
- 01-25-85 Drilled 6" hole from 40' to 42' cased with 5-1/2" casing. Cut HCQ core #4 from 42' to 43'. Reamed and drilled 6" hole from 42' to 52' cased with 5-1/2" casing. Cut HCQ core #5 from 52' to 53'. Reamed and drilled 6" hole from 52' to 62' cased with 5-1/2" casing. Cut HCQ core #6 from 62' to 63'. Secured rig for weekend.
- 01-28-85 Rig secured from 01-25-85 to 01-28-85. Reamed and drilled 6" hole from 62' to 72' cased with 5-1/2" casing. Cut HCQ core #7 from 72' to 72.5'. Reamed and drilled 6" hole from 72' to 92' cased with 5-1/2" casing. Changed HCQ diamond core bit.
- 01-29-85 Cut HCQ core #8 from 92' to 93'. Reamed and drilled 6" hole from 92' to 112' cased with 5-1/2" casing. Cut HCQ core #9 from 112' to 113'. Reamed and drilled 6" hole from 112' to 117' cased with 5-1/2" casing.
- 01-30-85 Drilled 6" hole from 117' to 132' cased with 5-1/2" casing. Attempted to cut HCQ core #10 at 132', coring too slow, no core. Drilled 6" hole from 132' to 147' cased with 5-1/2" casing.
- 01-31-85 Started drilling 6" hole, tight hole. Cut HCQ core #11 from 147' to 147.3'. Started to cut core #12, core bit would not drill. Rigged up to jack up casing.
- 02-01-85 Attempted to pull 5-1/2" casing using two 2-ton jacks along with hydraulic bit under casing. Moved casing up 1", top joint of casing parted. Replaced top joint and changed hammer bit. Reamed and drilled 6" hole from 147' to 153' cased with 5-1/2" casing. Changed from 6" hammer bit to 4-1/2" hammer bit. Drilled 4-1/2" hole from 153' to 164'. Secured rig for weekend.
- 02-04-85 Rig secured from 02-01-85 to 02-04-85. Drilled 4-1/2" hole from 164' to 170'. Cut HCQ core #12 from 170' to 171'.

USW UZ-13
Hole History
Page 2

- 02-05-85 Prepared to pull stuck 5-1/2" casing. Strung 4 line blocks with new line. Made trip in with Bowen full circle spear, jars, and bumper sub on 2-3/8" IF drill collar, tools stopped at 20'. Backed off casing, recovered 5-1/2" x 2.10' sub and 5 joints of 5-1/2" x 5' casing. Made trip in with Bowen ITCO spear and mechanical jars on 2-3/8" IF drill collars to 153' and set spear at 144.65'. Jars set for 30,000# kept tripping at 12,000#, no casing movement.
- 02-06-85 Attempted to jar 5-1/2" casing up hole, no movement. Released and reset spear at 115'. Jarred casing at 12,000# and pulled on casing to 45,000# using rig, casing free. Laid down 20 joints of 5-1/2" x 5' casing, pin broke on bottom of #2 joint. Left 1 joint of stainless steel casing and drive shoe in the hole, 7' total with top of fish at 147.1'. Made trip in with Bowen tools on 2-3/8" IF drill collars to fill at 146'. Cleaned out fill to 150' using air as directed. Set spear in fish and made trip out. No apparent junk was left in hole.
- 02-07-85 Made trip in with 4-1/2" hammer bit, cleaned out bridge at 40', and made trip out. Lowered light to 137'. Made trip in with 5-1/2" x 7' stainless steel shoe and 2 joints of 5-1/2" x 5' stainless steel pipe on 5-1/2" ODEX casing to 40'. Drilled casing to 75' using 6" ODEX hammer bit. Pulled bit and lowered 5-1/2" casing to 132'.
- 02-08-85 Reamed 6" hole to 153' using 6" hammer bit. Reamed tight hole from 145' to 153' several times. Cased hole with 5-1/2" casing to 153'. Worked on broken rig transmission from 1000 hours. Secured rig for weekend.
- 02-11-85 Rig secured from 02-08-85 to 02-11-85. Worked on rig.
- 02-12-85 Repaired transmission to 0900 hours. Reamed and drilled 6" hole from 153' to 200' cased with 5-1/2" casing.
- 02-13-85 Drilled 6" hole from 200' to 255' cased with 5-1/2" casing.
- 02-14-85 Drilled 6" hole from 255' to 275' cased with 5-1/2" casing. Repaired rig 4 hours.
- 02-15-85 Started reaming 6" hole at 275', lost bit in the hole. Attempted to screw into bit, no recovery. Ran fabricated overshot, no recovery. Ran wax impression block, bit pin at an angle. Continued fishing. Secured rig for weekend and holiday.
- 02-19-85 Rig secured from 02-15-85 to 02-19-85. Fished for 4-1/2" x 6" hammer bit using fabricated fishing tools as follows:
- Run #1 w/3-1/2" x 10-3/4" overshot and grapple
 - Run #2 w/4-1/2" x 36" hook
 - Run #3 w/3-1/2" x 10-3/4" overshot and grapple

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- 02-19-85 Run #4 w/4-1/2" x 36" hook
(Cont.) Run #5 w/4-1/2" x 36" hook and 4" strap
Run #6 w/3-1/2" x 10-3/4" overshot and grapple
No recovery.

Ran impression tool, bit in same position.
- 02-20-85 Ran 3-1/2" x 10-3/4" overshot and grapple, no recovery. Ran Westech TV camera to 274'. Camera indicated 4-1/2" x 6" bit below casing and in horizontal position. Waited on orders.
- 02-21-85 Pulled 4 joints of 5-1/2" casing. Ran impression block using a sand line. Cleaned out 1' fill to bit using 4-1/2" hammer bit. Placed C-4 shape charge and primacord at 175' and stemmed hole with 40# of borehole cuttings. Occupation safety crew set off junk shot using a delay electric cap. Cleaned out hole and drilled 6" hole to 278' cased with 5-1/2" casing using ODEX 115 system, left hammer bit in the hole. Ran fabricated overshot and grapple, no recovery.
- 02-22-85 Made 5 runs using Westech TV camera, camera indicated hammer bit laying on side below 5-1/2" casing at 278'. Occupation safety crew placed 23# of C-4 junk charge on top of bit in the hole and stemmed the hole with 200# of borehole cuttings. Pulled casing up to 257' and set off charge. Cleaned out hole to 278' and drilled 6" hole to 279' cased with 5-1/2" casing, casing shoe broke off. Pulled casing and tools up to 179'. Secured rig for weekend.
- 02-25-85 Rig secured from 02-22-85 to 02-25-85. Pulled 5-1/2" casing, 2-3/8" drill pipe, and parted 7' stainless steel casing and shoe. Removed casing from hammer bit and dressed bit. Made trip in to 157' with 7' stainless steel casing and shoe on 5-1/2" casing.
- 02-26-85 Lowered 5-1/2" casing and tools to 277'. Drove casing to 279'. Drilled 6" hole to 282' cased with 5-1/2" casing. Drilled on metal from junk shot. Cleaned hole and attempted to pull hammer bit; 2-3/8" drill pipe parted at 276.2' leaving 5' drilling assembly and 10" of drill pipe in the hole.
- 02-27-85 Ran impression tool; 2-3/8" drill pipe bent over to 5-1/2" casing. Ran Tri-State overshot, released hammer bit, and made trip out. Casing moved up 3'. Recovered fish but left parts of broken spiral grapple in the hole. Ran Tri-State 4-1/2" O.D. magnet on sand line to 270', could not get deeper. Ran magnet on 2-3/8" drill pipe and cleaned hole to 282' using air.
- 02-28-85 Completed magnet run, no recovery. Ran 4-1/2" hammer bit and drilled 4-1/2" hole from 282' to 286', hole sticky. Ran 4-1/2" magnet on wire line to 274', could not get deeper. Ran impression block. Pulled 5-1/2" casing, 7' stainless steel shoe joint was loose and threads gauded. Ran 4-1/2" magnet on 2-3/8" drill pipe

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- 02-28-85 to 278', slight junk recovery. Changed guide on magnet and cleaned out fill to 279' using air.
(Cont.)
- 03-01-85 Prepared to secure rig on location. Rig secured at 1300 hours.
- 03-04-85 Rig secured from 03-01-85 to 03-04-85. Lowered 20# C-4 explosive charge in the hole and stemmed hole with 150 sacks of sand. Detonated the junk charge, hole did not vent.
- 04-05-85 Rig secured from 03-04-85 to 1200 hours, 04-05-85. Moved in support equipment and secured rig at 1500 hours.
- 04-08-85 Rig secured from 04-05-85 to 04-08-85. Made up ODEX 115 6" hammer bit and made trip in to bridge at 37'. Cleaned out bridge and made trip for 5-1/2" casing and 26' long casing shoe. Casing stopped at 171', worked casing to 176' using 6" hammer bit. Made trip for 4-1/2" bit and cleaned out blast sand to 281'. Made trip for 6" ODEX hammer bit.
- 04-09-85 Worked 5-1/2" casing from 176' to 286' and cleaned out hole. Made trip to change hammer bit, left 2 bit gauge buttons and 2 bit face buttons in the hole. Drilled 6" hole from 286' to 306' cased with 5-1/2" casing.
- 04-10-85 Drilled 6" hole from 306' to 335' cased with 5-1/2" casing. Pulled out 6" hammer bit. Made trip in with 3.9" x 2.4" core bit, and wire line HCQ core barrel on HCQ rods. Cut 3.9" core #13 from 335' to 335.5'.
- 04-11-85 Cut 3.9" core #14 from 335.5' to 337.5'. Made trip for 6" hammer bit. Opened 3.9" hole from 335' to 337.5' and drilled 6" hole to 345' cased with 5-1/2" casing. Made trip for 4-1/4" drag bit and HCQ core barrel. Cut 4-1/4" core #15 from 345' to 349.3'.
- 04-12-85 Cut 4-1/4" core #16 from 349.3' to 349.7'. Made trip for diamond core bit, left crown of drag bit in the hole. Cut 4-1/4" cores #17 thru #19 from 349.7' to 363.4'. Secured rig for weekend.
- 04-15-85 Rig secured from 04-12-85 to 04-15-85. Cut 4-1/4" core #20 from 363.4' to 366.6'. Made trip for drag core bit. Cut 4-1/4" cores #21 thru #28 from 366.6' to 400'. Made trip for diamond core bit.
- 04-16-85 Attempted to cut 4-1/4" core #29, core bit would not drill. Made trip for 6" ODEX drilling system. Opened 4-1/4" hole to 6" from 345' to 371' cased with 5-1/2" casing.
- 04-17-85 Opened 4-1/4" hole from 371' to 400' and drilled 6" hole to 410' cased with 5-1/2" casing. Made trip for 3.937" diamond core bit and wire line HCQ barrel. Cut 3.937" cores #29 and #30 from 410' to 417'.

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Hole History
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- 04-18-85 Cut 3.937" cores #31 thru #33 from 417' to 430.1'. Laid down HCQ tools and ODEX tools. Pulled 5-1/2" casing up to 330'.
- 04-19-85 Rigged down and moved out. Hole completed 04-19-85.
- 03-18-86 Ran Westech 3-1/2" O.D. color TV camera to 407' T.D.

**USW UZ-13
CORE RECORD**

<u>Core No.</u>	<u>Interval</u>	<u>Footage Cored</u>	<u>Footage Recovered</u>	<u>% Recovery</u>
1	12.0 - 13.5	1.5	1.5	100
2	22.0 - 24.0	2.0	1.2	60
3	32.0 - 32.5	0.5	0.0	0
4	42.0 - 43.0	1.0	0.8	80
5	52.0 - 53.0	1.0	1.0	100
6	62.0 - 63.0	1.0	1.0	100
7	72.0 - 72.5	0.5	0.6	120
8	92.0 - 93.0	1.0	1.0	100
9	112.0 - 113.0	1.0	1.0	100
10	NO CORE - Drilled	-	-	-
11	147.0 - 147.3	0.3	0.3	100
12	170.0 - 171.0	1.0	0.75	75
13	335.0 - 335.5	0.5	0.5	100
14	335.5 - 337.5	2.0	2.0	100
15	345.0 - 349.3	4.3	4.3	100
16	349.3 - 349.7	0.4	0.4	100
17	349.7 - 354.7	5.0	5.0	100
18	354.7 - 359.2	4.5	4.5	100
19	359.2 - 363.4	4.2	4.2	100
20	363.4 - 366.6	3.2	3.2	100
21	366.6 - 371.8	5.2	5.2	100
22	371.8 - 377.0	5.2	5.2	100
23	377.0 - 382.2	5.2	5.2	100
24	382.2 - 387.4	5.2	5.2	100
25	387.4 - 392.4	5.0	4.5	90
26	392.4 - 397.4	5.0	4.7	94
27	397.4 - 399.4	2.0	2.0	100
28	399.4 - 400.0	0.6	0.6	100
29	410.0 - 415.1	5.1	5.1	100
30	415.1 - 417.0	1.9	1.9	100
31	417.0 - 422.2	5.2	5.2	100
32	422.2 - 427.2	5.0	4.9	98
33	427.2 - 430.1	2.9	3.0	103

USW UZ-13
REVIEW OF HOLE CONDITIONS

152 mm (6") hole cased with 140 mm (5-1/2") casing was drilled to a depth of 125.0 m (410') using ODEX 115 system and 100 mm (3.937") cores were taken to a total depth of 131.1 m (430'). During drilling, a total of 32 cores: seventeen 108 mm (4.25"), thirteen 100 mm (3.937"), and two 99 mm (3.9") were taken. 140 mm (5-1/2") casing was pulled up to 100.6 m (330'). Hole was completed 04-19-85. TV camera was run to 124.1 m (407'), 03-18-86.

Appendix A
GEOPHYSICAL LOGS RUN IN DRILL HOLE

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HOLE: USW UZ-1

INSTRUMENTED UNSATURATED ZONE TEST HOLE

<u>LOG TYPE</u>	<u>MICROFICHE (sheet,row)</u>	<u>RUN NO.</u>	<u>LOG DATE</u>	<u>LOGGING COMPANY</u>	<u>LOGGED INTERNAL</u>	
					<u>BTM LOG</u>	<u>TOP LOG</u>
Caliper	(1,1)	1	7/7/83	Birdwell	1,255'	1,247'
Caliper	(1,3)	2	7/19/83	Birdwell	1,255'	10'
Casing Collar Locator	(1,5)	1	7/27/83	Birdwell	1,248'	980'
Casing Collar Locator	(2,4)	2	10/3/83	Birdwell	1,210.5'	1,150'
Casing Collar Locator	(2,4)	3	10/3/83	Birdwell	1,179.5'	1,173'
Casing Collar Locator	(3,1)	4	10/7/83	Birdwell	1,132'	1,000'
Density	(2,3)	1	7/20/83	Birdwell	96'	20'
Density Borehole Compensated	(2,1)	1	7/19/83	Birdwell	1,261'	90'
Water Locator	(2,4)	1	10/3/83	Birdwell	1,217'	1,150'
Water Locator	(2,4)	2	10/3/83	Birdwell	1,179.5'	1,150'
Water Locator	(3,1)	3 to 169	10/4/83 to 10/24/83	Birdwell	1,217'	10'
Fluid Density for Water Location	(3,4)	1-A	7/7/83	Birdwell	1,254'	1,170'
Fluid Density for Water Location	(3,4)	1-B	7/7/83	Birdwell	1,254'	1,170'
Fluid Density for Water Location	(3,5)	2	7/7/83	Birdwell	1,245'	1,100'
Fluid Density for Water Location	(4,1)	3	7/19/83	Birdwell	1,262'	1,230'

GEOPHYSICAL LOGS RUN IN DRILL HOLE

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HOLE: USW UZ-1 (continued)

INSTRUMENTED UNSATURATED ZONE TEST HOLE

<u>LOG TYPE</u>	<u>MICROFICHE (sheet,row)</u>	<u>RUN NO.</u>	<u>LOG DATE</u>	<u>LOGGING COMPANY</u>	<u>LOGGED BTM LOG</u>	<u>INTERNAL TOP LOG</u>
Fluid Density for Water Location	(2,5)	4	7/27/83	Birdwell	1,210'	1,170'
Fluid Density for Water Location	(2,5)	5	7/27/83	Birdwell	1,210'	1,170'
Gamma Ray	(4,2)	1	7/19/83	Birdwell	1,247'	10'
Gamma Ray	(4,2)	2	7/19/83	Birdwell	82'	10'
Spectralog Gamma Ray (5")	(4,5)	1	7/20/83	Birdwell	1,258'	0'
Spectralog Gamma Ray (2")	(4,4)	1	7/20/83	Birdwell	1,258'	0'
Epithermal Neutron Porosity	(4,2)	1	7/19/83	Birdwell	1,262'	80'
Epithermal Neutron Porosity	(4,2)	2	7/19/83	Birdwell	97'	10'
Induction	(5,1)	1	7/19/83	Birdwell	1,258'	10'
Dielectric Log (5")	(5,3)	1	7/20/83	Birdwell	1,258'	40'

GEOPHYSICAL LOGS RUN IN DRILL HOLE

PAGE 1 of 2

HOLE: USW UZ-6

UNSATURATED ZONE TEST HOLE

<u>LOG TYPE</u>	<u>MICROFICHE (sheet,row)</u>	<u>RUN NO.</u>	<u>LOG DATE</u>	<u>LOGGING COMPANY</u>	<u>LOGGED BTM LOG</u>	<u>INTERNAL TOP LOG</u>
Caliper	(1,1)	1	8/7/84	Birdwell	763'	270'
Caliper	(1,3)	2	8/31/84	Birdwell	1,210'	270'
Caliper	(1,5)	3	9/26/84	Birdwell	1,847'	270'
Density	(2,2)	1	8/7/84	Birdwell	770'	300'
Densilog Gamma Ray (5")	(2,4)	1	9/28/84	Dresser Atlas	1,856'	325'
Densilog Gamma Ray (2")	(2,3)	1	9/28/84	Dresser Atlas	1,856'	325'
Compensated Densilog	(2,5)	1	9/28/84	Dresser Atlas	1,856'	324'
Fluid Density for Water Location	(6,4)	1	9/26/84	Birdwell	1,862'	1,786'
Gamma Ray	(5,5)	1	8/7/84	Birdwell	768'	0'
Gamma Ray	(6,1)	2	9/28/84	Birdwell	1,851'	0'
Spectralog Gamma Ray (5")	(5,1)	1	9/28/84	Dresser Atlas	1,857'	0'
Spectralog Gamma Ray (2")	(4,5)	1	9/28/84	Dresser Atlas	1,857'	0'
Spectralog	(5,3)	1	9/28/84	Dresser Atlas	1,857'	0'
Epithermal Neutron Porosity	(4,2)	1	8/7/84	Birdwell	769'	300'
Epithermal Neutron Porosity	(4,3)	2	9/28/84	Birdwell	1,852'	300'
Induction	(3,2)	1	8/7/84	Birdwell	766'	300'
Induction	(3,3)	2	9/26/84	Birdwell	1,850'	288'

GEOPHYSICAL LOGS RUN IN DRILL HOLE

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HOLE: USW UZ-6 (continued)

UNSATURATED ZONE TEST HOLE

<u>LOG TYPE</u>	<u>MICROFICHE (sheet, row)</u>	<u>RUN NO.</u>	<u>LOG DATE</u>	<u>LOGGING COMPANY</u>	<u>LOGGED INTERNAL</u>	
					<u>BTM LOG</u>	<u>TOP LOG</u>
Dielectric Log (5")	(3,5)	1	9/28/84	Dresser Atlas	1,852'	325'
Temperature	(6,5)	1	8/7/84	Birdwell	768	0'
Temperature	(6,1)	2	9/28/84	Birdwell	1,850'	0'
Geophone Survey (SVC)	(6,3)	1	10/4/84	Birdwell	1,840'	335'

Item Description:	NNWSI Hole Histories USW UZ-1 USW UZ-6s UE-25 UZ #4 USW UZ-7 UE-25 UZ #5 USW UZ-8 USW UZ-6 USW UZ-13
Availability:	<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available
Sensitivity:	<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Non-Sensitive-Copyright <input type="checkbox"/> Sensitive <input type="checkbox"/> Sensitive-Copyright
Electronic Media Type: <small>(if applicable)</small>	Microfiche
Contact:	US Nuclear Regulatory Commission Office of Nuclear Materials Safety and Safeguards Yucca Mountain Project Manager
Storage/File Location:	US Nuclear Regulatory Commission Office of Nuclear Materials Safety and Safeguards Two White Flint North Room T7- E34 11545 Rockville Pike Rockville, Maryland 20852-2738