

APPENDIX E

Geotechnical Investigation Summary Report

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1.0 INTRODUCTION

This report presents the geotechnical site exploration results and preliminary foundation recommendations for the proposed 240 ha (600-acre) Eagle Rock Enrichment Facility site (EREF) located in Bonneville County, Idaho. MWH (Montgomery Watson Harza) under contract to AREVA performed various subsurface investigations between November 2007 and May 2008 as part of a larger environmental study for the proposed facility. The portions of that study that provide applicable geotechnical information are summarized and provide the basis for the recommendations included herein.

The proposed site is approximately 27 km (17 miles) west of Idaho Falls, Idaho, and occupies the SW $\frac{1}{4}$ of section 13, the SE $\frac{1}{4}$ of section 14, the NE $\frac{1}{4}$ of section 23, and the NW $\frac{1}{4}$ of section 24, Township 3 N, Range 34 E. The site ranges in elevation from 1,556 to 1,600 m (5,106 to 5,250 feet).

2.0 GEOLOGIC SETTING

The site is located in the eastern Snake River Plain, part of an extensive topographic depression in southern Idaho that covers about 40,400 km² (~ 15,600 mi²). Quaternary basalt flows cover approximately 95% of the surface of the plain. Interbeds of sand, silt, and clay, with smaller amounts of volcanic ash occur between the flows.

3.0 SITE GEOTECHNICAL INVESTIGATIONS

MWH conducted several investigations at the site in the last quarter of 2007 and second quarter of 2008 including two soil boring programs with laboratory testing, a well drilling program that included rock coring, and a geologic mapping which provided information applicable to foundation design.

The first investigation consisted of 20 borings drilled to bedrock November 27, 2007. These borings are located in a rectangular area immediately to the west of the portion of the site currently proposed for the EREF structures (see Figure E.1). These borings are designated BH1 to BH20 and range in depth from 0.76 to 4.27 m (2.5 to 14 feet) below ground surface. Andrew Well Drilling drilled these borings using a 108mm (4.25-inch) inside diameter (ID), 209mm (8.25-inch) outside diameter (OD) continuous-flight hollow stem auger with a truck-mounted CME-85 drill rig. Standard Penetration Test (SPT) samples were collected using a 38.1mm (1.5-inch) ID, 50.8mm (2-inch) OD split spoon sampler driven 457mm (18 inches) with a 63.5 kg (140-pound) safety hammer free-falling 762mm (30 inches) in accordance with ASTM D1566-99. In addition, a Dames & Moore 61.7mm (2.43-inch) ID, 63.5mm (2.5-inch) OD sampler was driven 304.8mm (12 inches) using a 63.5 kg (140-pound) safety hammer free falling 762mm (30 inches). Samples were collected approximately every 1.52m (5 feet) for the full length of each boring. A qualified field engineer recorded the number of hammer blows required to drive both the split spoon sampler and the Dames & Moore sampler each 152mm (6-inch) increment over the sampling intervals. The material encountered in each boring was logged and classified in accordance with the Unified Soil Classification System. Dames & Moore tube samples were preserved and transported per ASTM-D4220-95. Material collected as part of the SPT sampling was stored in airtight bags. The boring locations are shown on Figure E.1 and the boring logs are presented in Section 7.0.

As part of the November 2007 subsurface exploration, 8 soil samples were tested at Terracon Laboratories of Fort Collins, CO. Analyses included testing for natural moisture content (ASTM D2216-98), grain size analysis (ASTM D422-63R02), and Atterberg limits (ASTM D4318-00).

Terracon also performed three natural dry density tests (ASTM D2216-98) and one swell consolidation test (ASTM D2435-02) on these samples. The laboratory results are included in Section 8.0, and the results of the index testing are shown on Table E.1

Between April 21 and May 8, 2008, Crux Subsurface Inc, continuously cored the bedrock using an HQ core barrel and 1.52 m (5 foot) runs to a total depth of 222.65 m (730.5 feet) as part of the construction of a groundwater monitoring well. This well is identified as GW-1 and is one of a series of wells constructed as part of a hydro geological investigation. It was the only well cored at that time. The groundwater well locations, including GW-1, are shown on Figure E.1. The GW-1 core log is included in Section 7.0.

Subsequent to the November 2007 drilling, the proposed facility location was moved approximately 1,220m (4,000 feet) to the east. Between May 12 and May 13, 2008, an additional 10 borings were drilled to better define subsurface conditions at the adjusted facility location. These borings are designated as BH21 to BH30 and ranged in depth from 0.15 to 6.2 m (0.5 to 20.5 feet). Andrew Well Drilling Service drilled and sampled to bedrock using the same-sized hollow stem augers, sampling equipment and intervals as in the previous investigation. The borings are shown on Figure E.1 and the boring logs are included in Section 7.0.

As part of the May 2008 subsurface investigation, 11 soil samples were selected for laboratory analysis at Terracon Laboratories (Fort Collins, CO). Analyses performed included 9 natural moisture content tests (ASTM D2216-98), 4 Atterberg limit tests (ASTM D4318-00), 2 specific gravity tests (ASTM D854-06), 2 swell consolidation tests (ASTM D2435-02), 2 proctor compaction tests (ASTM D1557-02), and 2 Resistance R-Value tests (ASTM D2844-01). In addition, Terracon also performed 2 pH tests [AASHTO T289-91-UL (2004)], 2 resistivity tests [AASHTO T288-91-UL (2004)], and 2 tests for water soluble sulfate [AASHTO T290-95-UL (2003)]. The laboratory results are included in Section 8.0, and the results of the index testing are shown on Table E.1. The results of the chemical testing are shown on Table E.2.

In addition to the subsurface investigations, soil and bedrock mapping was also performed between May 14 and May 16. This mapping provided some additional information regarding the site bedrock structure, overburden, and site drainage patterns.

4.0 SUBSURFACE CONDITIONS

4.1 SOIL CONDITIONS

Soils at the site are reported to be of eolian origin and directly overlie basalt lava flows. Soil generally ranges in thickness from 0 to 4.3m (0 to 14 feet), although soil was found approximately 6.2 m (20.5 ft) thick at BH30. Basalt outcrops are intermittently exposed and in total comprise about 14% of the site ground surface area.

Field identification and laboratory testing indicate that the soil is primarily lean clay and lean clay with sand (CL) with colors such as light tan, tan, light brown, and dark brown. The natural moisture content ranges from 9.6 to 19% and the Plasticity Index (PI) ranges from 10 to 24.

The Standard Penetration Test (SPT) field N-values ranged from 1 to 43 suggesting a low plasticity clay that ranges from very soft to hard. The median value (18 blows per ft) suggests a medium stiff clay. Because rock fragments were noted in samples associated with high blow counts, it is possible that these high values are biased and do not reflect soil strength. The natural dry density ranged from 1.30 to 1.79 g/cm³ (81.2 to 112 lbs/ft³).

The compression index, C_c , from consolidation tests ranged from 0.114 to 0.26, which is similar to wind-blow deposits (Winkerton and Fang 1975, Table 2.40). Some of these tests suggest that a potential for collapse exists.

4.2 BEDROCK CONDITIONS

Geologic mapping of the bedrock exposures indicates that the basalt is strongly vesicular and includes discontinuities such as strongly developed columnar jointing and numerous cavities. Several collapsed lava tubes filled with rubble were reported in the site area.

Rock Quality Designations (RQD) for one deep cored boring indicate that the bedrock ranges from fair to excellent quality (64% to 100%) within the top 30 m (100 ft) of the boring. Several localized zones of broken rock and soil were observed at considerably greater depths. A fractured interval between 69 m (225 ft) and 70 m (230 ft) yielded an RQD of 0 and a 2.5 m (8 ft) layer of soil was encountered between 123 m (403 ft) and 125 m (410 ft). Thinner layers of soil were encountered between 18.6 m (61 ft) and 19.5 m (64 ft) and 59.1m (194 ft) and 60.8 m (199.5 ft). The depths of these zones greatly exceed the anticipated depth of influence of foundations and will not negatively impact the capacity of the rock to provide adequate bearing.

4.3 GROUNDWATER

Groundwater was not encountered during the subsurface investigations that were limited to the surface soils. Groundwater was encountered in the observation wells at depths greater than 150 m (500 ft).

5.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

5.1 FOUNDATIONS ON ROCK

It is expected that most of the heavy structures at the site will be founded directly on the bedrock. Basalt of this nature typically provides adequate support for footings, mats, and deep foundations with the loads similar to those anticipated for the EREF structures. NAVFAC (1986a) presents presumptive allowable bearing pressures for spread footings that range from 960 to 7,660 kPa (10 to 80 tsf) for rock with consistency varying from soft to hard. Peck, Hanson and Thornburn (1974) present allowable contact pressures on jointed rock as a function of RQD. An allowable contact pressure of 960 kPa (10 tsf) is recommended for an RQD of zero. Peck, Hanson and Thornburn (1974) also note that the allowable contact pressure beneath foundations is governed exclusively by the settlement associated with the defects in the rock, and not by strength. Therefore, the allowable loading on the rock will be governed by the allowable settlement and is expected to be far less than the allowable loading when only bearing capacity (strength) is considered. Settlement evaluation will consider the allowable total and differential settlement of equipment and buildings.

5.2 FOUNDATIONS ON SOIL

Other support alternatives for heavy structures to be considered at the final design stage will be removal of unsuitable surface soils and backfilling with structural or engineered fill. Modified Proctor tests performed on site soils resulted in maximum dry densities of 1.78 and 1.80 g/cm³ (111 and 112.5 lbs/ft³) at optimum moisture contents of 14 and 14.5%. Because the site soil is generally classified as low plasticity clay it is unlikely to be suitable for use as structural fill. The structural fill requirements will be detailed at the final design stage but suitable materials will include crushed rock, well graded gravel and sand mixtures.

Lightly loaded, non-settlement sensitive structures, may potentially be founded directly on the site soil. If this option is considered further, the bearing capacity of the in situ soil including the potential for collapse will be evaluated.

Two resistance R-value tests were performed on samples taken from depths of 0.3 m (1 foot) and 1.5 m (5 feet). The R-values for these samples were 17 and 16 respectively at 2,069 kPa (300 psi) exudation pressure. These values are at the upper limit of the typical range (5-15) of R-values for clays and suggest a CBR value between 7 and 10 (Yoder 1975, Figure 15.5). Pavement design will be performed in conjunction with an analysis of the expected loads on the roads.

5.3 CORROSION PROTECTION

The Federal Highway Administration uses the following criteria to indicate a potentially corrosive environment: soil resistivity values less than 2000 ohm-cm, soil pH less than 5, sulfate above 200 ppm and chloride above 100 ppm (FHWA 2000). Tests on two samples yielded resistivity values of 1229 Ohm-cm and 245 Ohm-cm and water soluble sulfate values of 100 and 1700 ppm. The low resistivity values and high sulfate concentrations suggest an environment with corrosion potential and may warrant further investigation. The pH of the soil was 8.36.

5.4 SEISMIC SITE CLASS

The 2006 edition of the International Building Code defines site classes based on the material present in the upper 30.5m (100 feet) of the soil profile and the overall soil stiffness as indicated by shear wave velocity, SPT blow counts, or average undrained shear strength. Based on geologic maps and local soil investigations, it is estimated that the Site Class D applies for structures founded on the native soils and that Site Class C applies for structures founded on rock (MWH 2008b). Further testing is required to determine if the site meets the requirements of Site Class B or A.

5.5 LIQUEFACTION

It is expected that the final design subsurface information will confirm that there is no need to perform a liquefaction analysis. Liquefaction potential is greatest where the groundwater level is shallow and saturated loose fine sands occur within a depth of about 15 m (50 ft). Groundwater was encountered in the observation wells at depths of more than 150 m (500 ft). The surface soils at the site are dry and partially saturated. Therefore, potential for liquefaction of the surface soils with groundwater at these depths appears highly unlikely. If required, the assessment of soil liquefaction potential will be performed using the applicable guidance of Regulatory Guide 1.198, Procedures and Criteria for Assessing Seismic Soil Liquefaction at Nuclear power Plant Sites, dated November 2003 (NRC, 2003).

6.0 RECOMMENDATIONS FOR ADDITIONAL WORK

Additional soil borings and rock coring will be performed at the site to support final design. Laboratory testing of soil and rock samples and additional in-situ tests will be performed as necessary to determine static and dynamic soil and rock properties. This information will be used to evaluate foundation bearing capacity, estimated settlement and provide geotechnical input for soil/rock structure interaction analysis. It is expected that the final design subsurface information will confirm that there is no need to perform a liquefaction analysis.

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TABLES

Table E.1 - Summary of Soil Index Property Testing
(Page 1 of 1)

Boring	Depth (m [(ft)])	Specific Gravity	Natural Moisture Content (%)	Natural Dry Density (g/cm ³ [pcf])	Gradation					Atterberg Limits		Soil Type
					Gravel (%)	Sand (%)	Fines (%)	Silt (%)	Clay (%)	LL (%)	PI (%)	
BH1	3.0 [10]		15.5	1.67 [104.4]	2.1	14.3	84			35	16	CL
BH5	1.5 [5]		13.6		0.2	6	93.8	72.7	21.1	29	13	CL
BH6	1.5 [5]		9.6		4		96			31	13	CL
BH7	1.5 [5]		14.1	1.79 [112]	9		91			36	17	CL
BH10	1.5 [5]		10.9		0.1	10.9	89			29	11	CL
BH12	3.2 [10.5]		12.0	1.41 [88]	0	2	98			35	15	CL
BH14	1.5 [5]		11.8		0	6	94			27	10	CL
BH18	1.6 [5.5]		15.1		0.4	8.6	91	58.5	32.5	31	14	CL
BH22	1.5 [5]		16.3									CL
BH23	0.3 [1]						89			36	12	CL
BH23	1.5 [5]	2.69					87			33	14	CL
BH25	1.6 [5.5]	2.7	14.9				86			42	24	CL
BH28	1.5 [5]		10.6									CL
BH29	1.6 [5.5]		13.0	1.30 [81.2]								CL
BH29	3.0 [10]		16.0									CL
BH30	1.6 [5.5]		10.7	1.45 [90.4]			97			35	16	CL
BH30	3.2 [10.5]		12.7									CL
BH30	4.7 [15.5]		14.7									CL
BH30	6.2 [20.5]		19.0									CL

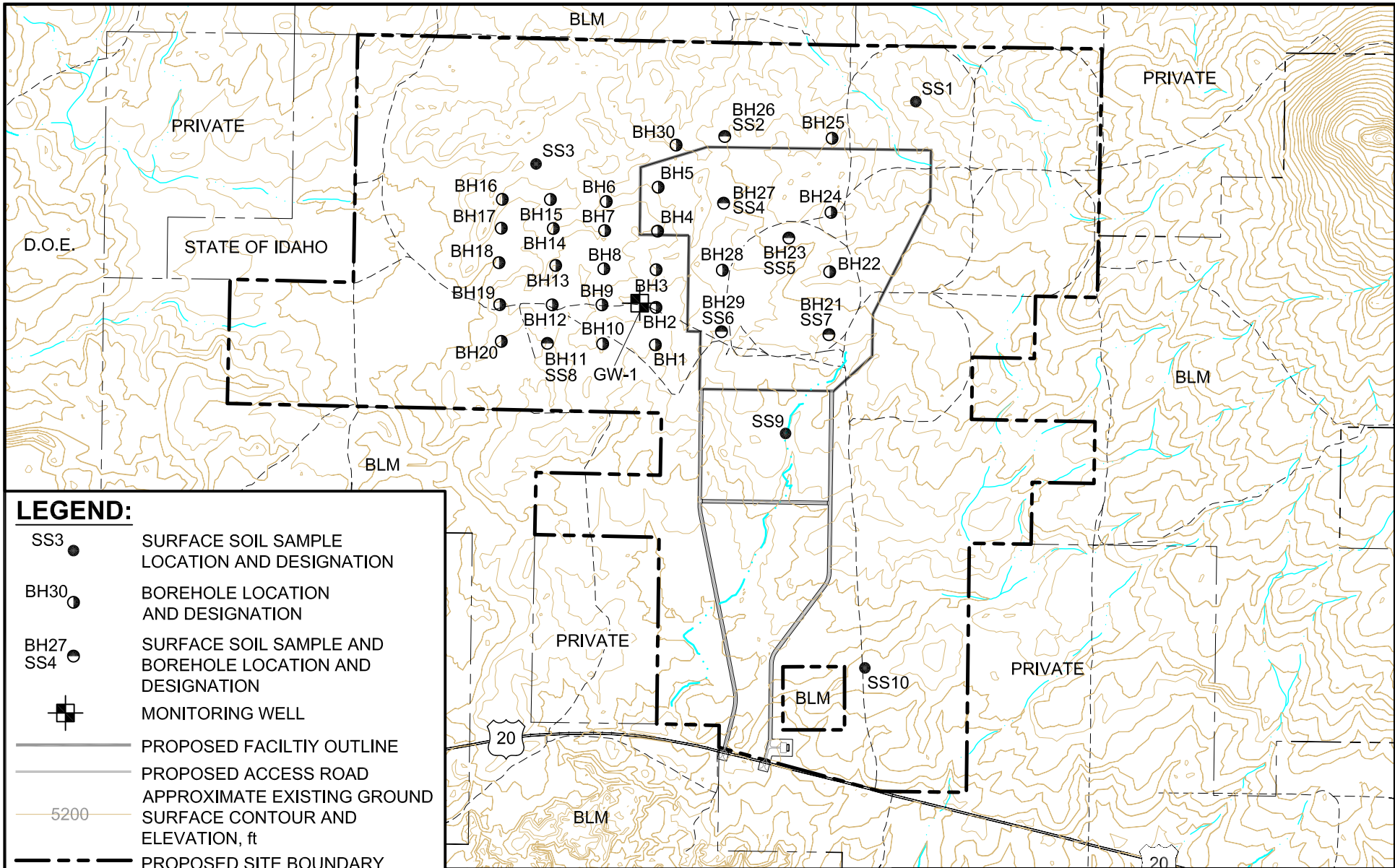
Specific Gravity	ASTM D854-06
Natural Moisture Content	ASTM D2216-98
Natural Dry Density	ASTM D2216-98
Grain Size Analysis	ASTM D422-63R02
Atterberg Limits	ASTM D4318-00

**Table E.2 - Summary of Soil Chemical Testing
(Page 1 of 1)**

Boring	Depth (ft)	Water Soluble Sulfate (ppm)	Resitivity (Ohm-cm)	pH
BH23	5	100	1,229	8.36
BH25	5.5	1,700	245	8.36

Water Soluble Sulfate	AASHTO T290-95-UL (2003)
Resistivity	AASHTO T288-91-UL (2004)
pH	AASHTO T289-91-UL (2004)

FIGURES



LEGEND:

- SS3 ● SURFACE SOIL SAMPLE LOCATION AND DESIGNATION
- BH30 ● BOREHOLE LOCATION AND DESIGNATION
- BH27 ● SURFACE SOIL SAMPLE AND BOREHOLE LOCATION AND DESIGNATION
- SS4 ●
- MONITORING WELL
- PROPOSED FACILITY OUTLINE
- PROPOSED ACCESS ROAD
- 5200 APPROXIMATE EXISTING GROUND SURFACE CONTOUR AND ELEVATION, ft
- - - PROPOSED SITE BOUNDARY
- - - EXISTING ROAD

NOTES:

1. GROUND SURFACE CONTOUR ELEVATIONS ARE SHOWN IN FEET. METRIC CONVERSION IS 1 m = 3.281 ft.

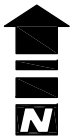
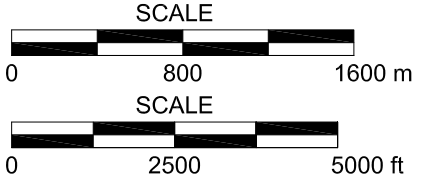



Figure E-1 **Rev. 2**
 Borehole and Soil Sample Locations
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ENVIRONMENTAL REPORT

7.0 BORING LOGS

7.1 NOVEMBER 2007 – SOIL



BH1 through BH20



SOIL BORING LOG						Boring: BH1	
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:			
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 11.5 ft		Depth to Water (ft):		Northing: 697370.594		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 584549.293		Ground Elev.: 5163.35	
Notes: USCS Classification for sample taken at 10-11 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan to lt. brown clay, dry	CL			Observations from cuttings
			Tan to lt. brown clay, dry	CL	10	7	Observations from cuttings.
			Tan to lt. brown clay, dry	CL			
10	5153.35		Brown clay with black basalt fragments, moist	CL	12	41	
			Refusal	ROCK			
20	5143.35						
30	5133.35						
40	5123.35						
50	5113.35						
60	5103.35						
70	5093.35						



MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG			Boring: BH2		
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Logged By: MMB		Checked By:		Job No.:	
Total Depth (ft): 10.5 ft		Depth to Water (ft):		Northing: 698166.589		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 584550.606		Ground Elev.: 5174.71	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Powdery Observations from cuttings
			Tan to lt. brown clay, slightly moist	CL	4	16	2" Layer of flaky, very light tan clay, dry
			Tan to lt. brown clay, dry	CL			Observations from cuttings
10	5164.71			Brown clay with black basalt fragments, moist	CL ROCK	4	51/5"
			Refusal				
20	5154.71						
30	5144.71						
40	5134.71						
50	5124.71						
60	5114.71						
70	5104.71						


MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG			Boring: BH3		
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Logged By: MMB		Checked By:		Job No.:	
Total Depth (ft): 11 ft		Depth to Water (ft):		Northing: 698968.082		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 584543.132		Ground Elev.: 5183.79	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Lt. brown clay, slightly moist	CL	3	9	Observations from cuttings
			Tan to lt. brown clay, dry	CL			
10	5173.79		Brown clay with black basalt fragments, dry	CL	14	25	
				Refusal	ROCK		
20	5163.79						
30	5153.79						
40	5143.79						
50	5133.79						
60	5123.79						
70	5113.79						

MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH4	
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Total Depth (ft): 12 ft		Depth to Water (ft):		Job No.:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Logged By: MMB		Checked By:	
		Northing: 699788.587		Vertical Angle:			
		Easting: 584562.744		Ground Elev.: 5175.05			
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Brown, moist clay	CL	6	12	Observations from cuttings
			Tan to lt. brown clay, dry	CL			
10	5165.05			Brown, moist clay	CL	8	53
			Refusal	ROCK			
20	5155.05						
30	5145.05						
40	5135.05						
50	5125.05						
60	5115.05						
70	5105.05						



SOIL BORING LOG						Boring: BH5	
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:			
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 8 ft		Depth to Water (ft):		Northing: 700721.325		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 584561.471		Ground Elev.: 5187.12	
Notes: USCS Classification for sample taken at 5-6 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Tan clay, dry	CL	DM	25	
10	5177.12		Refusal	ROCK			
20	5167.12						
30	5157.12						
40	5147.12						
50	5137.12						
60	5127.12						
70	5117.12						



SOIL BORING LOG						Boring: BH6	
 MWH <small>MONTGOMERY WATSON HARZA</small>				Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:	
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 8 ft		Depth to Water (ft):		Northing: 700402.146		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared & John		Easting: 583463.980		Ground Elev.: 5177.77
Notes: USCS Classification for sample taken at 5-6 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Brown clay, slightly moist	CL	8	29	some organic material, grasses
10	5167.77		Refusal	ROCK			
20	5157.77						
30	5147.77						
40	5137.77						
50	5127.77						
60	5117.77						
70	5107.77						



SOIL BORING LOG						Boring: BH7	
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1		Job No.:	
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 7 ft		Depth to Water (ft):		Northing: 699784.158		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 583438.274		Ground Elev.: 5163.93	
Notes: USCS Classification for sample taken at 5-6 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Brown clay, moist	CL	6	31	
			Refusal	ROCK			
10	5153.93						
20	5143.93						
30	5133.93						
40	5123.93						
50	5113.93						
60	5103.93						
70	5093.93						



MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH8	
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Total Depth (ft): 0.5 ft		Depth to Water (ft):		Job No.:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Logged By: MMB		Checked By:	
		Northing: 698972.681		Vertical Angle:			
		Easting: 583433.222		Ground Elev.: 5167.09			
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Refusal	6" ROCK			
10	5157.09						
20	5147.09						
30	5137.09						
40	5127.09						
50	5117.09						
60	5107.09						
70	5097.09						


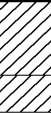
MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH9	
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Total Depth (ft): 8 ft		Depth to Water (ft):		Job No.:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Logged By: MMB		Checked By:	
		Easting: 583403.290		Northing: 698205.143		Vertical Angle:	
		Ground Elev.: 5177.50					
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0		[Hatched Pattern]	Tan clay, dry	CL			Observations from cuttings
			Brown clay, moist	CL	4	6	
10	5167.5		Refusal	ROCK			
20	5157.5						
30	5147.5						
40	5137.5						
50	5127.5						
60	5117.5						
70	5107.5						


SOIL BORING LOG						Boring: BH10	
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: <i>Bonneville Idaho Site</i>		Sheet No.: 1 of 1		Job No.:	
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 14 ft		Depth to Water (ft):		Northing: 697377.148		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 583429.386		Ground Elev.: 5170.42	
Notes: USCS Classification for sample taken at 5-6 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Tan clay, dry	CL	DM	21	Observations from cuttings
			Tan to lt. brown clay, dry	CL			
10	5160.42			Lt. brown clay, moist	CL	12	28
				Refusal	ROCK		
20	5150.42						
30	5140.42						
40	5130.42						
50	5120.42						
60	5110.42						
70	5100.42						



SOIL BORING LOG						Boring:	BH11
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 2.5 ft		Depth to Water (ft):		Northing: 697369.858		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared & John		Easting: 582255.624		Ground Elev.: 5153.86
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. brown clay, dry	CL			Observations from cuttings
			Refusal	ROCK	2'6"		
10	5143.86						
20	5133.86						
30	5123.86						
40	5113.86						
50	5103.86						
60	5093.86						
70	5083.86						


SOIL BORING LOG						Boring: BH12		
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:				
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:		
Total Depth (ft): 14 ft		Depth to Water (ft):		Northing: 698189.820		Vertical Angle:		
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Easting: 582346.566		Ground Elev.: 5164.68		
Notes: USCS Classification for sample taken at 10.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.								
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)	
0			Brown clay, dry	CL			Observations from cuttings	
				Lt. tan clay, dry	CL	4	15	Observations from cuttings
				Tan to lt. brown clay, dry	CL			
10	5154.68			Lt. brown clay, dry	CL	DM	42	
			Refusal	ROCK				
20	5144.68							
30	5134.68							
40	5124.68							
50	5114.68							
60	5104.68							
70	5094.68							



SOIL BORING LOG						Boring: BH13	
 MWH <small>MONTGOMERY WATSON HARZA</small>				Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:	
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 7 ft		Depth to Water (ft):		Northing: 699027.830		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared & John		Easting: 582409.000		Ground Elev.: 5171.78
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. brown to tan clay, dry	CL			Observations from cuttings some organics
			Tan clay, slightly moist	CL	6	20	
			Refusal	ROCK			
10	5161.78						
20	5151.78						
30	5141.78						
40	5131.78						
50	5121.78						
60	5111.78						
70	5101.78						



SOIL BORING LOG						Boring: BH14	
 MWH <small>MONTGOMERY WATSON HARZA</small>				Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:	
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 7.5 ft		Depth to Water (ft):		Northing: 699812.711		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared & John		Easting: 582346.787		Ground Elev.: 5160.75
Notes: USCS Classification for sample taken at 5-6 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. brown to tan clay, dry	CL			Observations from cuttings
			Brown clay, moist	CL	6	16	
			Refusal	ROCK			
10	5150.75						
20	5140.75						
30	5130.75						
40	5120.75						
50	5110.75						
60	5100.75						
70	5090.75						



MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH15	
Project: Bonneville Idaho Site		Date Started: 11/27/2007		Date Completed: 11/27/2007		Sheet No.: 1 of 1	
Feature:		Total Depth (ft): 3.5 ft		Depth to Water (ft):		Job No.:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared & John		Logged By: MMB		Checked By:	
		Easting: 582276.876		Northing: 700429.172		Vertical Angle:	
		Ground Elev.: 5155.33					
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Refusal	ROCK			
10	5145.33						
20	5135.33						
30	5125.33						
40	5115.33						
50	5105.33						
60	5095.33						
70	5085.33						

SOIL BORING LOG						Boring:	BH16
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started:	11/27/2007	Date Completed:	11/27/2007	Logged By:	MMB	Checked By:	
Total Depth (ft):	3.5 ft	Depth to Water (ft):		Northing:	700417.722	Vertical Angle:	
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared & John	Easting:	581254.851	Ground Elev.: 5157.03	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Tan clay, dry	CL			Observations from cuttings
			Refusal	ROCK	3'6"		outcrop of basalt @ 40' NW of boring
10	5147.03						
20	5137.03						
30	5127.03						
40	5117.03						
50	5107.03						
60	5097.03						
70	5087.03						

SOIL BORING LOG						Boring: BH17
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: <i>Bonneville Idaho Site</i>			Sheet No.: 1 of 1	
		Feature:			Job No.:	
Date Started:	11/27/2007	Date Completed:	11/27/2007	Logged By:	MMB	Checked By:
Total Depth (ft):	4 ft	Depth to Water (ft):		Northing:	699804.006	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared & John	Easting:	581241.975	Ground Elev.: 5142.74
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.						
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value
0		▨	Lt. tan clay, dry	CL		
			Refusal	ROCK		
10	5132.74					
20	5122.74					
30	5112.74					
40	5102.74					
50	5092.74					
60	5082.74					
70	5072.74					
Observations from cuttings						

SOIL BORING LOG						Boring:	BH18
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 5.5 ft		Depth to Water (ft):		Northing: 699070.493		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared & John		Easting: 581204.628		Ground Elev.: 5143.55
Notes: USCS Classification for sample taken at 5.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. brown clay, dry	CL			Observations from cuttings
			Tan clay with basalt fragments, dry	ROCK ROCK	DM	50/3"	
			Refusal				
10	5133.55						
20	5123.55						
30	5113.55						
40	5103.55						
50	5093.55						
60	5083.55						
70	5073.55						

SOIL BORING LOG						Boring:	BH19
 MWH <small>MONTGOMERY WATSON HARZA</small>						Project: Bonneville Idaho Site	
						Feature:	
Date Started:	11/27/2007	Date Completed:	11/27/2007	Logged By:	MMB	Checked By:	
Total Depth (ft):	3 ft	Depth to Water (ft):		Northing:	698179.118	Vertical Angle:	
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared & John	Easting:	581231.495	Ground Elev.: 5157.59	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. tan clay, dry	CL			Observations from cuttings
			Refusal	ROCK			
10	5147.59						
20	5137.59						
30	5127.59						
40	5117.59						
50	5107.59						
60	5097.59						
70	5087.59						


SOIL BORING LOG						Boring:	BH20
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started: 11/27/2007		Date Completed: 11/27/2007		Logged By: MMB		Checked By:	
Total Depth (ft): 6 ft		Depth to Water (ft):		Northing: 697398.230		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared		Easting: 581275.579		Ground Elev.: 5148.46
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. tan clay, dry	CL			Observations from cuttings
			Lt. brown clay, dry	5' ROCK	4	7	
			Refusal	6' ROCK			
10	5138.46						
20	5128.46						
30	5118.46						
40	5108.46						
50	5098.46						
60	5088.46						
70	5078.46						



7.2 MAY 2008 – SOIL



BH21 through BH30



MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG			Boring: BH21	
Project: <i>Bonneville Idaho Site</i>		Date Started: 05/12/2008		Date Completed: 05/12/2008	Sheet No.: 1 of 1	
Feature:		Total Depth (ft): 2 ft		Depth to Water (ft):	Logged By: MMB	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Northing: 697639.321	Checked By:	
				Easting: 588232.531	Vertical Angle:	
					Ground Elev.: 5179.63	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.						
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value
0			Lt. brown silty clay, moist	CL		
			Refusal	ROCK		
10	5169.63					
20	5159.63					
30	5149.63					
40	5139.63					
50	5129.63					
60	5119.63					
70	5109.63					
Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)						
Observations from cuttings						



MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH22	
Project: Bonneville Idaho Site		Date Started: 05/12/2008		Date Completed: 05/12/2008		Sheet No.: 1 of 1	
Feature:		Logged By: MMB		Checked By:		Job No.:	
Total Depth (ft): 10 ft		Depth to Water (ft):		Northing: 698975.895		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 588229.955		Ground Elev.: 5204.89	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. brown silty clay, moist	CL			Observations from cuttings
			Soils very soft, split spoon sunk 12" on the first blow. Soil is brown silty clay, moist.	CL CL	8"	1	Sample taken from inside the center pivot area
10	5194.89		Brown silty clay, moist	ROCK			
20	5184.89						
30	5174.89						
40	5164.89						
50	5154.89						
60	5144.89						
70	5134.89						



SOIL BORING LOG						Boring:	BH23
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Date Started: 05/12/2008 Date Completed: 05/12/2008		Logged By: MMB Checked By:	
Total Depth (ft): 5 ft		Depth to Water (ft):		Northing: 699680.618		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 587352.350		Ground Elev.: 5194.98	
Notes: USCS Classification for samples taken at 1 ft and 5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			brown silty clay, moist.	CL			Proctor samples taken from 2.5' and 5' Observations from cuttings Samples from the NW side of center pivot
5				ROCK			
10	5184.98						
20	5174.98						
30	5164.98						
40	5154.98						
50	5144.98						
60	5134.98						
70	5124.98						



SOIL BORING LOG						Boring: BH24
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: <i>Bonneville Idaho Site</i>			Sheet No.: 1 of 1	
		Feature:			Job No.:	
Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By:	MMB	Checked By:
Total Depth (ft):	2.5 ft	Depth to Water (ft):		Northing:	700238.043	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting:	588240.236	Ground Elev.:
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.						
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value
0			Brown silty clay, moist.	CL		
			Refusal ----- 2'6"	ROCK		
10	5199.66					
20	5189.66					
30	5179.66					
40	5169.66					
50	5159.66					
60	5149.66					
70	5139.66					

SOIL BORING LOG						Boring: BH25	
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Sheet No.: 1 of 1 Job No.:			
Date Started: 05/13/2008		Date Completed: 05/13/2008		Logged By: MMB		Checked By:	
Total Depth (ft): 7 ft		Depth to Water (ft):		Northing: 701813.501		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 588240.620		Ground Elev.: 5200.64	
Notes: USCS Classification for sample taken at 5.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan silty clay, dry.	CL			Sagebrush area. Observations from cuttings
			Soil is brown silty clay, moist.	CL	12"	4	Observations from splitspoon
			Brown silty clay, moist.	CL			Observations from cuttings
10	5190.64		Refusal	ROCK			
20	5180.64						
30	5170.64						
40	5160.64						
50	5150.64						
60	5140.64						
70	5130.64						

SOIL BORING LOG						Boring:	BH26
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By:	MMB	Checked By:	
Total Depth (ft):	5.5 ft	Depth to Water (ft):		Northing:	701819.277	Vertical Angle:	
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting:	585961.373	Ground Elev.: 5191.40	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan silty clay, moist. Alligator cracking on surface.	CL			Observations from cuttings
			Brown clumpy silty clay, moist.	CL			
			Refusal	ROCK			
10	5181.4						
20	5171.4						
30	5161.4						
40	5151.4						
50	5141.4						
60	5131.4						
70	5121.4						

SOIL BORING LOG						Boring:	BH27
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:			Sheet No.: 1 of 1 Job No.:		
Date Started: 05/12/2008		Date Completed: 05/12/2008		Logged By: MMB		Checked By:	
Total Depth (ft): 5.5 ft		Depth to Water (ft):		Northing: 700401.262		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling			Driller: Jared		Easting: 585956.338		Ground Elev.: 5187.94
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan silty clay, dry.	CL			Sagebrush area. Observations from cuttings
			tan silty clay, powdery dry. No sample recovered.	CL			
			Refusal	ROCK			
10	5177.94						
20	5167.94						
30	5157.94						
40	5147.94						
50	5137.94						
60	5127.94						
70	5117.94						


SOIL BORING LOG						Boring:	BH28
 MWH <small>MONTGOMERY WATSON HARZA</small>		Project: Bonneville Idaho Site Feature:		Date Started: 05/12/2008 Date Completed: 05/12/2008		Logged By: MMB Checked By:	
Total Depth (ft): 6 ft		Depth to Water (ft):		Northing: 698977.686		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 585949.646		Ground Elev.: 5175.61	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Light brown silty clay, dry.	CL			Observations from cuttings
			tan silty clay, powdery dry.	CL		19	
			Refusal	ROCK			
10	5165.61						
20	5155.61						
30	5145.61						
40	5135.61						
50	5125.61						
60	5115.61						
70	5105.61						

SOIL BORING LOG						Boring: BH29	
 MWH MONTGOMERY WATSON HARZA		Project: <i>Bonneville Idaho Site</i>				Sheet No.: 1 of 1	
Date Started: 05/12/2008		Date Completed: 05/12/2008		Logged By: MMB		Checked By:	
Total Depth (ft): 12 ft		Depth to Water (ft):		Northing: 697669.188		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 585950.128		Ground Elev.: 5169.69	
Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, moist with alligator cracking at surface.	CL			Observations from cuttings.
			Soil is tan silty clay, moist. Not much cohesion.	CL	6"	33	Observations from sample.
			Brown silty clay, moist.	CL			Observations from cuttings.
10	5159.69			Brown silty clay, moist, more cohesive.	CL	12"	21
			Refusal	ROCK			
20	5149.69						
30	5139.69						
40	5129.69						
50	5119.69						
60	5109.69						
70	5099.69						

MWH MONTGOMERY WATSON HARZA		SOIL BORING LOG				Boring: BH30	
Project: Bonneville Idaho Site		Date Started: 05/12/2008		Date Completed: 05/12/2008		Sheet No.: 1 of 1	
Feature:		Logged By: MMB		Checked By:		Job No.:	
Total Depth (ft): 20.5 ft		Depth to Water (ft):		Northing: 701729.591		Vertical Angle:	
Drilling Contr.: Andrew Well Drilling		Driller: Jared		Easting: 584478.389		Ground Elev.: 5190.33	
Notes: USCS Classification for sample taken at 5.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.							
Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, dry	CL			Observations from cuttings
			Soil is brown clumpy silty clay, moist.	CL	6"	43	Observations from sample
			Brown silty clay, moist.	CL			Observations from cuttings
10	5180.33		Brown silty clay, moist.	CL	6"	11	Observations from sample
			Brown silty clay, moist	CL			Observations from cuttings
			Brown silty clay, moist	CL	8"	14	Observations from sample
			Brown silty clay, moist	CL			Observations from cuttings
20	5170.33		Brown silty clay, moist	ROCK	12	18	Observations from sample
			Refusal				
30	5160.33						
40	5150.33						
50	5140.33						
60	5130.33						
70	5120.33						

7.3 APRIL – MAY 2008 – ROCK CORING

GW-1

 ROCK BORING LOG										Hole No.: GW-1 Sheet No.: 1 of 67 Job No.: 1005746	
Date Started: 4/21/08			Date Completed: 5/8/08			Logged By: B. Bragdon		Checked By: K. Esposito			
Total Depth (ft): 730.5			Depth to Water (ft):			Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.			Driller: Brandon Gereaux			Easting: 584,480.21		Azimuth:			
Drill Rig: Rotary Core			Core Barrel: HQ x 5'			Ground Elev.: 5176.32					
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0									(ML) FINE SANDY SILT, DRY GRADING TO SLIGHTLY MOIST, SLIGHTLY PLASTIC MODERATE YELLOWISH BROWN 10YR 5/4, STIFF	BOX 1	
1			2.5/3.5 (83%)	NA							
2											
3											
4			1.5/1.5 (100%)	1.2/1.5 (80%)					SLIGHT WEATHERING VESICULAR OLIVINE BASALT, WK FEOX IN SOME VESICLES, HARD VERY STRONG ROCK		BEDROCK / SOIL INTERFACE
5		1						1 mm	BROWNISH BLACK (5Y 2/1) TO BLACK (N1) GRADING TO FRESH APPROX 5' BGS VESICLES UP TO 15 mm		
6			3.2/3.5 (90%)	3.2/3.5 (90%)				1 mm	LOST WATER CIRCULATION FLUID OUT IN FRACTURES		
7											
8											
9		2						1 mm	GRADING TO SMALLER VESICLES WITH FEW UP TO 10 mm		
10			2.0/2.0 (100%)	1.7/2.0 (85%)				1 mm			
		3						1-2 mm			BOX 2

1005746D008-A.dwg

MWH		ROCK BORING LOG				Hole No.: GW-1					
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Drill Rig: Rotary Core		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:			
Core Barrel: HQ x 5'		Ground Elev.: 5176.32									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
11			5.05.0 (100%)	3.65.0 (72%)							
12							70°		VESICULAR OLIVINE BASALT, WK FE0X LOCALLY BROWNISH BLACK (5Y 2/1) ABUNDANT VESICLES UP TO 10 mm		
13								1 mm 1 mm			
14											
15							80°	13 mm GAP			
16		4	4.95.0 (98%)	4.5/5.0 (90%)				1 mm 1 mm			
17									GRADES TO DARK REDDISH GRAY (10 YR 3/1)		
18							10-0°	1-2 mm			
19											
20							20° 80°				BOX 3
21		5	5.25.0 (100%)	5.2/5.0 (100%)				2-6 mm			

10057460008-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
						Sheet No.: 3 of 67				
						Job No.: 1005746				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
22						50°		VESICULAR OLIVINE BASALT, DARK GRAY (N4)		
23						30°				
24						1-2 mm				
25						10°		1 mm WITH 5 mm VOID		
26		6	5.0/5.0 (100%)	5.0/5.0 (100%)						
27										
28										
29										
30		7	5.0/5.0 (100%)	3.2/5.0 (64%)		30°		LARGE VESICLES UP TO 20 mm		
31						3 mm		SMALL VESICLES		
32						80°		CLAY ALONG FRACTURE, LARGE VESICLES UP TO 15 mm, GENERALLY <2 mm		

1005746D008-A.dwg

TEST P.8 K1=3.0 E5

BOX 4

MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
33											
34									SMALL VESICLES, GENERALLY 1-2 mm		
35		8	5.0/5.0 (100%)	5.0/5.0 (100%)			40°	3 mm			
36											
37											
38							90°	1-3 mm			BOX 5
39											
40											
41		9	5.0/5.0 (100%)	3.3/5.0 (66%)				UP TO 10 mm	40.5-41.4 VERY FINE SMALL VESICLES (<1 mm)		
42								UP TO 10 mm	GRADES TO GREENISH GRAY (5GY 6/1) BASALT, WITH LARGE (3-15 mm) VESICLES WITH CINDERS OF DUSKY RED (10R 3/3)		
43							40°		GRADES TO VERY DARK GRAY (N3)		
									GRADES TO WEAK RED (10R 4/2)		
									CINDERS DUSKY RED (10R 3/3)		

1005746D008-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
44										
45		10								
46			5.0/5.0 (100%)	5.0/5.0 (100%)				LARGE VESICLES 4-20 mm		
47						5 mm 60°		GRADES TO DUSKY RED (10R 3/2)		BOX 6
48										
49										
50		11								
51			5.1/5.0 (100%)	4.7/5.0 (94%)		2 mm 10°		51.5-53.5 VERY FINE GRAINED BASALT, FEW 1mm VESICLES		
52						2 mm 60°				
53										
54						2 mm 90°		3-5 mm VESICLES		

1005746D008-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
55		12									4/21/08
56			4.5/5.0 (90%)	3.6/5.0 (72%)					OLIVINE BASALT, DARK GRAY (N4) SMALL VESICLES (1 mm)		BOX 7
57											
58											
59									GRADES TO LARGER VESICLES (3-15 mm) AND DARK REDDISH GRAY (10R 3/1)		
60							85°	1 mm	5-10 mm OR MORE FRACTURE FILLED WITH SILTY FINE TO MEDIUM SAND, LOST APPROXIMATELY 0.5' OF MATERIAL WITH CIRCULATION		
61		13	5.0/5.0 (100%)	4.6/5.0 (92%)			90°		VESICULAR BASALT, DUSKY RED (2.5YR 3/2)		
62								1 mm	SILTY CLAY, YELLOWISH BROWN (10YR 5/4) MEDIUM PLASTICITY VERY STIFF		
63								1 mm	OLIVINE BASALT, DARK GRAY (N4) VESICLES 1-10 mm		
64									SILTY CLAY, AS ABOVE AT 61'		
65		14							VESICULAR BASALT, DUSKY RED (2.5YR 3/2) VESICLES 2-10 mm		

1005746D008-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
66			4.75.0 (94%)	3.1/5.0 (62%)			1-5 mm	VERY FRACTURED OLIVINE BASALT, 1-5 mm FRACTURES, REDDISH GRAY (2.5YR N5)		BOX 8
67						85°	2 mm			
68						80°	2 mm			
69							1-2 mm			
70		15					1 mm	VESICLES 3-10 mm		
71			4.8/5.0 (96%)	3.8/5.0 (76%)		50° 70°		WITH SILTY CLAY FRACTURE FILLING 2-10 mm PALE BROWN (10YR 6/3) BASALT, GRADES TO DARK GRAY (N4)		
72						80°	2 mm			
73								20 mm TOTAL WITH SILTY CLAY FRACTURE FILLING		
74								WITH SILTY CLAY FRACTURE FILLING		
75		16				20°	3 mm	3 mm, FEOX ALONG FRACTURE WITH TRACE CLAY		
76										

1005746D008-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
						Sheet No.: 8 of 67				
						Job No.: 1005746				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
77			5.0/5.0 (100%)	4.5/5.0 (90%)						BOX 9
78								LARGE VESICLES UP TO 20 mm ABOVE FRACTURE		
79								LARGE VESICLES		
80		17	5.0/5.0 (100%)	5.0/5.0 (100%)				MINOR RUBBLE WITH TRACE SILTY CLAY		
81										
82								OLIVINE BASALT, VERY DARK GRAY (N3) TO BLACK (N2.5) VERY FINE GRAINED FEW VESICLES OVER 3 mm		
83										
84										
85										
86		18	5.0/5.0 (100%)	5.0/5.0 (100%)				OLIVINE BASALT, VERY DARK GRAY (N3) TO BLACK (N2.5) VERY FINE GRAINED, FEW VESICLES 2 mm		
87										BOX 10

1005746D008-A.dwg

TEST P-7 $k_{sp} = 2.0 \text{ E-06}$

MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
88											
89											
90		19					30°	1-2 mm	BASALT, OLIVINE WITH 1-5 mm VESICLES VERY DARK GRAY (N3) TO BLACK (N2.5)		
91			4 9/5.0 (98%)	3 4/5.0 (68%)			60°	2 mm			
92							60°	1-2 mm			
93							70°	2 mm	3-8 mm WITH TRACE SILTY CLAY FRACTURE FILLING		
94							60°	1 mm			
95		20					60°	1 mm			
96			5.0/5.0 (100%)	3.2/5.0 (64%)			60°	1 mm	VERY FRACTURED, ALL 1-3 mm		
97							40°		VERY DARK GRAY (N3) WITH DARK REDDISH GRAY (10R 3/1) LOCALLY		BOX 11
98							60°				

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Feature: Core Log			Sheet No.: 10 of 67						
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon	Checked By: K. Esposito						
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53	Vertical Angle:						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21	Azimuth:						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
99											
100		21	4.9/5.0 (98%)	3.6/5.0 (72%)			80° 60° 50°		VERY FRACTURED WITH 1-3 mm FRACTURES		
101							50°	5 mm	GRADES TO VERY DARK GRAY (N3) WITH SOME DARK REDDISH GRAY (10R 3/1) MAINLY ALONG FRACTURES		
102							50°				
103							20-50°				
104											
105		22	5.0/5.0 (100%)	4.7/5.0 (94%)			60°		BASALT, OLIVINE VERY DARK GRAY (N3) WITH BLACK (N2.5) ALONG FRACTURES VERY SMALL 1 mm OR LESS, VESICLES		BOX 12
106							60°				
107							60°				
108							70°				
109							20°	2 mm			

1005746D008-A.dwg

MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1			
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
110		23	4 8/5.0 (96%)	2.4/5.0 (48%)				VERY SMALL VESICLES (1-2 mm)		
111						80°				
112						50°		OLIVINE BASALT, SMALL (<1 mm) VESICLES VERY DARK GRAY (N3)		
113						50°				
114								VERY FRACTURED TO RUBBLE (113-115.5) SOME SILTY CLAY FRACTURE FILLING		BOX 13
115		24	5 0/5.0 (100%)	3 1/5.0 (62%)			20 mm 20-40°			4/22/08
116								BASALT, GRADES TO LIGHT GRAY (N7) 30 mm FRACTURE COATING OF SILTY CLAY, MAY HAVE WASHED OUT BY DRILLING		
117										
118								3-5 mm VESICLES		
119						80°		BASALT, GRADES TO VERY DARK GRAY (N3) TO DARK REDDISH GRAY (10R 3/1)		
120		25	4 9/5.0 (98%)	4 9/5.0 (99%)				3-10 mm VESICLES		

1005746D009-A.dwg

MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
							Sheet No.: 12 of 67				
							Job No.: 1005746				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
121							80°	1 mm	OLIVINE BASALT, VERY DARK GRAY (N3) WITH SOME DARK REDDISH GRAY (10R 4/1), SMALL VESICLES (1 mm OR LESS) WITH FEW UP TO 15 mm LOCALLY		BOX 14
122						1-2 mm					
123							50°				
124							80°	1 mm			
125		26					70°	1 mm			
126			5.0/5.0 (100%)	4.8/5.0 (96%)				1 mm	FINE GRAINED OLIVINE BASALT, VESICLES <1 mm GRADES TO REDDISH BLACK (2.5YR N2.5) TO GRAY (N5)		
127											
128							70°	1 mm			
129											
130									INCREASE IN VESICLE SIZE TO 2-10 mm, SOME CINDERS OF WEAK RED (10R 4/4) AT 130.5		
131		27	5.0/5.0 (100%)	3.8/5.0 (76%)							
							80°	7 mm	BASALT, GRADES TO WEAK RED (10R 4/3)		

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1			
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
132						70°	2 mm	FRACTURED TO RUBBLE BASALT, WEAK RED (10R 4/3) VESICLES 2-10 mm	BOX 15	
133						70°	1 mm			
134						70°	2 mm			
135						40°				
135						50°	2 mm			
135						80°	2 mm			
136		28	5.0/5.0 (100%)	3.8/5.0 (76%)		80°	3 mm			
137						80°				
138						80°	20 mm VOID			
139						70°				
140						30°		RUBBLE 140-142.5		
141		29	5.0/5.0 (100%)	2.8/5.0 (56%)						
142										

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
143											BOX 16
144								1 mm	1-2 mm WITH TRACE SILT ALONG FRACTURES		
145		30					70°	1 mm			
146			4 2/5 0 (84%)	3 4/5 0 (68%)					RUBBLE / MAY HAVE BEEN VOID AT 145.5-146		
147							70°	2-5 mm	BASALT, WITH VESICLES UP TO 20 mm GENERALLY 5-10 mm WEAK RED (10R 4/3) WITH SOME DARK GRAY (N4)		
148						80°					
149											
150		31					80°	2 mm			
151			5 0/5 0 (100%)	4 7/5 0 (94%)			80°	2 mm			
152							70°	2 mm	WEAK RED (10R 4/3) 2 mm WITH SILTY CLAY ALONG FRACTURE SMALL VESICLES		
153							50°	1-3 mm	BASALT, GRADES TO GRAY (N5)		BOX 17

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Azimuth:						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Job No.: 1005746						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
154								10 mm	FRACTURE WITH SILTY CLAY OF MODERATE YELLOWISH BROWN (10YR 5/4), SLIGHT TO MEDIUM PLASTICITY		
155		32	5.0/5.0 (100%)	4.7/5.0 (94%)			20°				
156							10°				
157											
158									BASALT, GRADES TO WEAK RED (10R 4/2) WITH VESICLES 2-10 mm WITH CINDERS OF WEAK RED (10R 4/2) IN 10 mm VOID		
159								1 mm	BASALT, GRADES TO DUSKY RED (10R 3/3)		
160								3 mm	VESICLES AND VOIDS UP TO 15 mm		
161		33	4.8/5.0 (96%)	4.1/5.0 (82%)							
162							85°	5 mm			
163							80°	3 mm			
164							90°		LARGE VESICLES AND VOIDS UP TO 25 mm		BOX 18

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MWH		ROCK BORING LOG				Hole No.: GW-1					
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon					
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Sheet No.: 16 of 67					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Northing: 698,178.53		Vertical Angle:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Easting: 584,480.21		Azimuth:					
				Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
165		34	5.0/5.0 (100%)	5.0/5.0 (100%)					BASALT, DUSKY RED (10R 3/3) WITH DARK GRAY (N4), VESICLES UP TO 25 mm, GENERALLY FINE GRAINED WITH SMALL VESICLES, LESS THAN 1-2 mm		
166								80° 2-5 mm			
167											
168											
169											
170		35	5.0/5.0 (100%)	5.0/5.0 (100%)					FINE GRAINED BASALT, VESICLES 1-3 mm FEW TO 10 mm DARK GRAY (N4) TO DARK REDDISH GRAY (10R 3/1)		
171											
172								3 mm	VESICLES UP TO 20 mm 172-173 FEET		
173											BOX 19
174											
175		36	5.0/5.0 (100%)	4.1/5.0 (82%)							

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
176									DARK GRAY (N4) WITH SOME WEAK RED (10R 4/3) ALONG FRACTURES		
177							40°				
178							80°				
179							85°		GRADES TO VERY FINE GRAINED BASALT, WITH VESICLES <1 mm DARK GRAY (N4) WITH SOME WEAK RED (10R 4/3) VERY BROKEN TO RUBBLE 178-180.5		
180							50°				
181		37	5.0/5.0 (100%)	3.1/5.0 (62%)					VERY BROKEN TO RUBBLE 180.5-183		
182											BOX 20
183									MEDIUM GRAINED BASALT, WITH VESICLES UP TO 3 mm, VERY DARK GRAY (N3)		
184							40°	2 mm			
185		38									
186			5.0/5.0 (100%)	5.0/5.0 (100%)			10-20°	2 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Job No.: 1005746						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
187							40°	3-5 mm			
188									MEDIUM GRAINED BASALT, VERY DARK GRAY (N4)		
189							80°	1 mm			
190		39						1 mm			
191			5.0/5.0 (100%)	5.0/5.0 (100%)			50°				BOX 21
192							90°	2 mm			
193									LARGER VESICLES (UP TO 10 mm)		
194									RUBBLE ABOVE CONTACT FINE SANDY SILT, RED (10R 5/8) SLIGHTLY MOIST, NON PLASTIC		
195		40					ML				
196			5.0/5.0 (100%)	5.0/5.0 (100%)			ML				
197									GRADES TO YELLOWISH BROWN (10YR 5/4) AT 197		
									BASALT, DARK REDDISH GRAY (10R 4/1)		
											TEST P-6, 10/1/2.5 E.06

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MWH		Project: Areva		ROCK BORING LOG		Hole No.: GW-1					
		Feature: Core Log				Sheet No.: 19 of 67					
						Job No.: 1005746					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
198											
199							ML		SILTY CLAY, VERY STIFF, SLIGHTLY PLASTIC, SOME BEDDING		
200		41	5.0/5.0 (100%)	4.7/5.0 (94%)				80° 1 mm	VESICULAR BASALT, VERY DARK GRAY (N4), VESICLES UP TO 5 mm, GENERALLY 1-2 mm WITH TRACE SILTY CLAY WITH SOME REDDISH GRAY (10R 5/1) IN VESICLES		BOX 22
201								80° 3 mm			
202											
203								90° 2 mm	VESICLES UP TO 10 mm GENERALLY 1-5 mm		
204											
205		42	4.4/5.0 (88%)	3.5/5.0 (70%)				90° 1-3 mm			
206									VOID, DRILLED VERY FAST FOR APPROX 0.5' TRACE SILT COATING		
207											
208								90° 1 mm	BASALT GRADES TO GRAY (N5)		

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-209								VESICULAR BASALT, GRAY (N6) FINE GRAINED, SMALL VESICLES SOME UP TO 5 mm GENERALLY 1-2 mm		
-210		43	5.0/5.0 (100%)	4.1/5.0 (82%)				FRACTURED TO RUBBLE 210-210.8		BOX 23
-211							2 mm			
-212							40°			
-213							1 mm			
-214							30°	GRADES BASALT, TO DARK REDDISH GRAY (10R 4/1) AND TO LARGER VESICLES UP TO 10 mm		
-215							80°	FRACTURED TO RUBBLE WITH TRACE DUSKY RED (10R 3/7) CINDERS LARGE VESICLES UP TO 20 mm SOME OLIVINE ALONG FRACTURES		
-216		44	5.0/5.0 (100%)	3.5/5.0 (70%)						
-217										
-218								GRADES TO VERY FINE GRAINED BASALT, GRAY (N6)		
-219							80°			

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MWH		ROCK BORING LOG				Hole No.: GW-1					
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon					
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Sheet No.: 21 of 67					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Northing: 698,178.53		Job No.: 1005746					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Easting: 584,480.21		Checked By: K. Esposito					
				Ground Elev.: 5176.32		Azimuth:					
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-220		45							FINE GRAINED BASALT, AS ABOVE		BOX 24
-221			4 3/5.0 (86%)	3 3/5.0 (86%)							
-222									GRADES TO BLACK (N2.5) WITH VESICLES UP TO 15 mm		
-223											
-224									FRACTURED TO RUBBLE. LIKELY LAST 0.7' IN THIS INTERVAL. BLACK (N2.5) WITH WEAK RED (10R 4/4) CINDER SAND FRACTURE COATING		
-225		46									7/23/08
-226			3 2/5.0 (64%)	0/5.0 (0%)							
-227											
-228									BASALT, VERY BROKEN TO RUBBLE WEAK RED (10R 4/2) SOME AREAS OF DARK GRAY (N4) SILTY CLAY COATING LOCALLY		
-229											
-230		47									

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-231											BOX 25
-232									VESICULAR BASALT, WITH VESICLES UP TO 20 mm GENERALLY 2-10 mm DARK GRAY (N4), FINE GRAINED		
-233											
-234								80°	VOID		
-235		48						80°			
-236			5.0/5.0 (100%)	4.5/5.0 (90%)					GRADES TO FINE GRAINED BASALT, DARK GRAY (7.5R 4/1) WITH FEW VESICLES		
-237											
-238								70°	RUBBLE		
-239								50°			
-240											
-241		49	5.0/5.0 (100%)	4.6/5.0 (92%)					FINE GRAINED BASALT, DARK GRAY (7.5R 4/1) FEW VESICLES GREATER THAN 1 mm		BOX 26

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-242							70°	2 mm			
-243									RUBBLE OF BASALT, AND FILLED WITH SILTY FINE TO MEDIUM SAND BROWN (7.5R 4/4)		
-244							10°		GRADES TO DUSKY RED (10R 3/2) WITH ABUNDANT VESICLES UP TO 10 mm		
-245		50					70°	1 mm			
-245			4.95.0 (98%)	4.65.0 (92%)			70°	2 mm			
-246											
-247									WITH TRACE SILTY SAND		
-248							60°	1 mm	GRADES TO VERY FINE GRAINED BASALT, DARK GRAY (7.5R 4/1) WITH TRACE VESICLES GREATER THAN 1 mm		
-249							70°	1 mm			
-250											
-251		51					60°	1 mm			BOX 27
-251			5.05.0 (100%)	4.05.0 (80%)			70°	1 mm			
-252											

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-253							SM		SILTY SAND (SM), MODERATE YELLOWISH BROWN (10YR 5/4) NON PLASTIC		
-254							10"	2 mm	VESICULAR BASALT, BLACK (N2.5), ABUNDANT VESICLES UP TO 10 mm		
-255		52	5.0/5.0 (100%)	5.0/5.0 (100%)			2 mm	2 mm	WITH TRACE SILTY SAND ALONG FRACTURE		
-256							2 mm		VESICULAR BASALT, AS ABOVE GRADING TO DARK GRAY (7.5R 4/1)		
-257							2 mm				
-258							80"	1 mm			
-259		53	5.0/5.0 (100%)	4.7/5.0 (94%)					DECREASE IN AMOUNT OF VESICLES UP TO 10 mm		BOX 28
-260											
-261											
-262											
-263									FEW VUGS/VESICLES UP TO 20 mm		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-264											
-265		54	5.0/5.0 (100%)	5.0/5.0 (100%)				25°			
-266									VESICULAR BASALT, BLACK (N2.5) TO DARK GRAY (N4) FEW VESICLES GREATER THAN 5 mm		
-267											
-268								2 mm			
-269											
-270		55	5.0/5.0 (100%)	5.0/5.0 (100%)				2 mm	WITH TRACE YELLOWISH BROWN (10YR 5/4) SILT ALONG FRACTURE		BOX 29
-271								45°			
-272									NO FRACTURES, DARK REDDISH GRAY (10R 4/1), FINE GRAINED SMALL VESICLES 1-2 mm		
-273											
-274											

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1			
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-275		56	5.0/5.0 (100%)	4.3/5.0 (86%)						
-276						50°	1 mm			
-277										
-278							1 mm	FINE GRAINED BASALT, WITH FEW VESICLES GREATER THAN 3 mm		
-279								RUBBLE WITH CINDERS (RED 10R 4/4), SILT YELLOWISH BROWN (10YR 5/4) AND BASALT, BLACK (N2.5)		
-280		57						BLACK (N2.5) BASALT, WITH ABUNDANT VESICLES 5-8 mm		BOX 30
-281			5.0/5.0 (100%)	5.0/5.0 (100%)			2 mm	BASALT, GRADES TO DARK REDDISH GRAY (10R 3/1)		
-282						20°				
-283							1 mm			
-284						60°		GRADES TO BLACK (N2.5) BASALT, WITH ABUNDANT VESICLES 3-5 mm SOME 10-15 mm		
-285		58				20°	2.3 mm	FRACTURES FILLED WITH MODERATE YELLOWISH BROWN (10YR 5/4) SILT		
-285						80°				

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
						Sheet No.: 27 of 67					
						Job No.: 1005746					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-286			5.0/5.0 (100%)	4.6/5.0 (92%)			80°		BLACK (N2.5) BASALT, FINE GRAINED FEW VESICLES OVER 2 mm WITH FEW VUGS		
-287							80°	2 mm			
-288							10°				
-289							40°	5-10 mm	SOME SILT OF YELLOWISH BROWN (10YR 5/4) IN FRACTURES AND RUBBLE		BOX 31
-290							40°	1 mm	SOME DUSKY RED (10R 3/4) IN VUGS VOIDS		
-291		59	5.0/5.0 (100%)	3.7/5.0 (74%)			30°	3 mm	SOME SILT OF YELLOWISH BROWN (10YR 5/4)		
-292								1 mm			
-293								1 mm			
-294											
-295		60					50°		LARGER VESICLES APPROX 295 DARK GRAY (N4) TO BLACK (N2.5) WITH DUSKY RED IN VOIDS		
-296			5.0/5.0 (100%)	4.3/5.0 (86%)					RUBBLE		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Vertical Angle:						
		Azimuth:			Checked By: K. Esposito						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-297								1 mm			
-298									SILT IN FRACTURE LARGE VESICLES DARK GRAY BLACK		BOX 32
-299								1 mm			
-300		61	4.9/5.0 (98%)	4.6/5.0 (92%)					RUBBLE OF DARK GRAY (N3) TO BLACK (N2.5) BASALT, WITH WEAK RED (2.5/R 4/2) IN VESICLES SAND DUSKY RED (10R 3/3) ALONG FRACTURES		
-301											
-302											
-303								10° 2 mm			
-304											
-305		62	5.0/5.0 (100%)	3.7/5.0 (74%)				70°	RUBBLE OF DARK GRAY (N4) TO BLACK (N2.5) VESICULAR BASALT, WITH WEAK RED (10R 3/3) ALONG FRACTURES AND IN VESICLES		
-306								85° 1 mm			
-307								85° 2 mm			BOX 33

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-308									VERY FRACTURED BASALT, WITH WEAK RED (10R 4/4) CINDERS		
-309											
-310									VERY FRACTURED, BASALT, GRADES TO DUSKY RED (10R 3/2) WITH YELLOWISH BROWN (10YR 5/4) SILTY COATING ALONG FRACTURES		
-311		63	5.0/5.0 (100%)	3.8/5.0 (76%)			70°	2.5 mm			
-312							80°	2 mm	BLACK (N2.5) BASALT, WITH DUSKY RED (10R 3/2) IN VESICLES AND VOIDS UP TO 10 mm FRACTURE COATING OF LIGHT BROWN (7.5YR 6/3) AND IRIDESCENCE COATING		
-313											
-314								3 mm			
-315		64	2.0/2.5 (80%)	0.7/2.5 (28%)					VOID WITH LIGHT BROWN (7.5YR 6/3) COATING VESICLES UP TO 5 mm SOME VUGS		
-316									RUBBLE OF DUSKY RED (10R 3/2) AND DARK GRAY (N4) BASALT, TRACE YELLOWISH BROWN (10YR 5/4) SILT		
-317											
-318		65	2.4/2.4 (100%)	2.4/2.4 (100%)					BLACK (N2.5) VESICULAR BASALT, VESICLES UP TO 5 mm		

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4/24/08

MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Date Started: 4/21/08		Date Completed: 5/8/08			Logged By: B. Bragdon						
Total Depth (ft): 730.5		Depth to Water (ft):			Northing: 698,178.53						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Easting: 584,480.21						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Ground Elev.: 5176.32						
Checked By: K. Esposito		Job No.: 1005746		Vertical Angle:							
Azimuth:											
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-319								2 mm			SHORT CORE RUN TO CHECK DRILL BIT BOX 34
-320		66	4.2/4.6 (91%)	4.2/4.6 (91%)			60°	2 mm	VESICULAR BASALT, VERY DARK GRAY (N3) WITH VESICLES UP TO 10 mm		
-321											
-322											
-323								5 mm	WITH TRACE YELLOWISH BROWN (10YR 5/4) SILT COATING ALONG FRACTURE		
-324		67	1.0/1.0 (100%)	1.0/1.0 (100%)							
-325		68	5.0/5.0 (100%)	4.2/5.0 (84%)				1.2 mm	DECREASE IN VESICLES SIZE AND FINER GRAINED BASALT, VERY DARK GRAY (N3)		SHORT CORE RUN TO CHECK DRILL BIT
-326											
-327								85°			
-328								2 mm			BOX 35
-329								30°			
								1.4 mm	WITH SOME YELLOWISH BROWN (10YR 5/4) COATING ALONG FRACTURES AND TRACE SILT LOCALLY		
								10			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-330		69									
-331			5.0/5.0 (100%)	4.4/5.0 (88%)					SOME GAPS AND VOIDS ALONG FRACTURES WITH YELLOWISH BROWN (10YR 5/4) SILT ALONG FRACTURE		
-332											
-333									GRADES TO VERY FINE GRAINED NO VESICLES > 1 mm		
-334							VOID		VESICULAR BASALT, OF REDDISH GRAY (10R 3/1) WITH WEAK RED (10R 4/4) AND YELLOWISH BROWN (10YR 5/4) SILT ALONG FRACTURES. ABUNDANT VESICLES UP TO 10 mm		
-335		70									
-336			5.0/5.0 (100%)	4.7/5.0 (94%)				2 mm			
-337								60°			
-338								50°			
-339								1-2 mm	GRADES TO VERY DARK GRAY (N3) WITH REDDISH GRAY (10R 3/1) LOCALLY WITH FEW VESICLES VESICLES UP TO 3 mm		BOX 36
-340		71						80°			
								3 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-341			5.0/5.0 (100%)	4.8/5.0 (92%)				3 mm			
-342							20°	1 mm			
-343							85°	2 mm	GRADES TO WEAK RED (10R 4/2) LARGE VESICLES UP TO 15 mm		
-344							40°	1 mm	GRADES TO DARK GRAY (N4) FINE TO MEDIUM GRAINED FEW VESICLES >2 mm		
-345		72	5.0/5.0 (100%)	4.7/5.0 (94%)							
-346									LARGER VESICLES AT 345.3 AND SOME WEAK RED (10R 4/3) IN VESICLES WITH SOME YELLOW BROWN (10YR 5/4) COATING ALONG FRACTURE VESICLES UP TO 10 mm		
-347							90°	1-5 mm			BOX 37
-348							90°	1-10 mm			
-349							70°	1 mm	SOME FRACTURE COATING OF YELLOW BROWN (10YR 5/4)		
-350								3 mm			
-351		73	5.0/5.0 (100%)	5.0/5.0 (100%)							

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-352							90°	2-10 mm			
-353											
-354									GRADES TO FINE GRAINED BASALT, WITH SOME HORIZONTAL VUGS, VESICLES 1 mm OR <1 mm, DARK GRAY (N4)		
-355		74	4 5/5.0 (90%)	4 3/5.0 (86%)							
-356							60°	10 mm	VOID WITH TRACE YELLOWISH BROWN COATING ALONG FRACTURE, BASALT, GRADES TO WEAK RED (10R 4/3) WITH VESICLES UP TO 15 mm		
-357							80°	2 mm			BOX 38
-358											
-359								3 mm 1 mm	GRADES TO DARK REDDISH GRAY (10R 3/1) WITH VESICLES UP TO 15 mm WITH SOME BENTONITE FROM DRILLING FLUID ALONG FRACTURES		
-360		75	5 0/5.0 (100%)	4 6/5.0 (92%)				2 mm	GRADES TO VERY FINE GRAINED BASALT		
-361									GRADES TO BASALT, WITH VESICLES UP TO 8 mm, BLACK (N2.5)		
-362									VOID 10-20 mm		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Vertical Angle:						
		Azimuth:			Checked By: K. Esposito						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-363									GRADES TO WEAK RED (10R 4/2) WITH VESICLES UP TO 10 mm		
-364							50°				
-365		76					30°		2-5 mm TRACE YELLOWISH BROWN FRACTURE COATING, BASALT, GRADES TO DUSKY RED (10R 3/2)		
-366			4 5/5 0 (90%)	2 8/5 0 (56%)			60°				
-367							2-5 mm		DARK RED (10R 3/4) FRACTURE COATING, TRACE SILTY SAND OF YELLOWISH BROWN (10YR 5/4) GRADES TO RUBBLE		BOX 39
-368							40°				
-369							30°		BASALT, GRADES TO VERY DARK GRAY (N3) WITH VESICLES UP TO 5 mm		
-370		77									
-371			4 9/5 0 (98%)	4 9/5 0 (98%)			10°	1 mm			
-372									WITH TRACE YELLOWISH BROWN (10YR 5/4) COATING ALONG FRACTURE, BASALT, GRADES TO VERY DARK GRAY (N3) WITH VESICLES 5-20 mm		
-373								2-3 mm			

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1			
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-374										
-375		78	4 9/5 0 (98%)	4 9/5 0 (98%)				GRADES TO VERY FINE GRAINED BASALT, FEW VESICLES AND VOIDS UP TO 10 mm GENERALLY <1 mm		
-376										
-377										
-378										
-379										
-380		79	4 9/5 0 (98%)	4 6/5 0 (92%)		90°	1 mm			
-381						60°	1-2 mm	VERY FINE GRAINED BASALT, WITH FEW VESICLES >1 mm GRADES TO BLACK (N2.5)		
-382						50°	1 mm			
-383						60°	2-20 mm	WITH TRACE SILTY COATING IN FRACTURE AND VOID OF YELLOWISH BROWN (10YR 5/4)		
-384						50°	10 mm	SOME RUBBLE		

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TEST P-5 K=5.9 E/D4
BOX 40

MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Date Started: 4/21/08		Date Completed: 5/8/08			Logged By: B. Bragdon						
Total Depth (ft): 730.5		Depth to Water (ft):			Checked By: K. Esposito						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Azimuth:						
					Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-385		80	5.0/5.0 (100%)	5.0/5.0 (100%)							
-386							70°	2 mm	VERY FINE GRAINED BASALT, BLACK (N2.5) WITH FEW VESICLES > 1 mm		
-387							50°				BOX 41
-388							1 mm		WITH TRACE SILTY COATING LOCALLY ALONG FRACTURES OF YELLOWISH BROWN (10YR 5/4)		
-389							70°	1 mm			
-390		81	5.0/5.0 (100%)	4.3/5.0 (86%)			50°	1 mm			
-391							40°	1 mm			
-392							1 mm				
-393							50°	1 mm			
-394							40°	2 mm			
-395		82	4.5/5.0 (90%)	2.8/5.0 (56%)			20°		VERY BROKEN AND WITH TRACE COATING OF YELLOWISH BROWN (10YR 5/4) SILT ALONG FRACTURES, GRADING TO LARGE VESICLES UP TO 10 mm AND TRACE WEAK RED (10R 4/2) CINDERS AND COATING		BOX 42 4/25/08

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
Checked By: K. Esposito		Job No.: 1005746									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-396									VESICULAR BASALT, DARK REDDISH GRAY (10R 3/1) WITH VESICLES AND FRACTURES OF RED (10R 4/ 6), VERY BROKEN 2-5 mm VUGS UP TO 20 mm		
-397											
-399								70° 2 mm			
-399								5-10 mm	GRADES TO VERY FINE GRAINED BASALT, WITH VERY FEW VESICLES >1 mm VERY DARK GRAY (N3) TO BLACK (N25)		
-400		83	4.8/4.8 (100%)	4.8/4.8 (100%)							
-401											
-401								10° 2 mm	GRADES TO VESICULAR BASALT, WITH VESICLES UP TO 5-8 mm, VERY DARK GRAY (N3)		
-402											
-403								MU/CL	SILT/CLAY, LOW TO MEDIUM PLASTICITY LOCALLY, STRONG BROWN (5YR 5/6) WITH COARSE GRAVEL TO COBBLE SIZE BASALT	TEST P-4 $K_{sp} = 3.6 E-06$	
-404											
-405		83	4.2/5.0 (84%)	0/5.0 (0%)							BOX 43
-406									INCREASE IN SIZE OF BASALT IN SOIL MATRIX BROWN (7.5YR 5/3)		

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1			
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-407										
-408										
-409								GRADES TO CLAYEY SILT, SLIGHTLY MOIST		
-410		84						WITH SOME FINE TO MEDIUM SAND		
-411			5.0/5.0 (100%)	4.7/5.0 (94%)		60°	3 mm	FINE GRAINED BASALT, WITH FEW VESICLES AND VUGS 5-20 mm VERY DARK GRAY (N3)		
-412						70°	1 mm			
-413						80°	3 mm	FRACTURE COATING OF YELLOWISH BROWN (10YR 5/4)		
-414							20 mm	VOID WITH SOME RUBBLE		
-415		85								BOX 44
-416			5.0/5.0 (100%)	5.0/5.0 (100%)		20°	3 mm			
-417						60°	1 mm	FINE GRAINED BASALT, WITH FEW VUGS AND VESICLES UP TO 10 mm VERY DARK GRAY (N3)		
-417						50°	2 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Azimuth:						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Job No.: 1005746						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-418								40° 2 mm	WITH SOME PALE BROWN (10YR 6/3) COATING ALONG FRACTURE		
-419								60°	VOID OF 20 mm		
-420		86									
-421			5.05.0 (100%)	3.75.0 (74%)				10°			
-422											
-423								20°	GRADES TO COARSE GRAINED BASALT, WITH PHENOCRYSTS AND ABUNDANT VESICLES UP TO 5 mm, BLACK (N2.5) WITH DUSKY RED (10R 3/3) LOCALLY IN VESICLES AND ALONG FRACTURES FILLED WITH CINDERS DUSKY RED (10R 3/3) LOCALLY		
-424								50°			
-425		86						90°			BOX 45
-426			5.05.0 (100%)	4.55.0 (90%)				50°			
-427								60°			
-428								60°	RUBBLE IN FRACTURE (30 mm)		
								85°			
								1-2 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Vertical Angle:						
		Azimuth:			Checked By: K. Esposito						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-429								2 mm			
-430		88	4 5/5.0 (90%)	3 0/5.0 (60%)			85°				
-431									VESICULAR BASALT, WITH PHENOCRYSTS, VESICLES UP TO 10 mm GENERALLY 2-5 mm, BLACK (N2.5) WITH SOME DUSKY RED (10R 4/4) IN FRACTURES AND VESICLES		
-432									RUBBLE		
-433											
-434											
-435		89	5 0/5.0 (100%)	3 4/5.0 (68%)			70°	1 mm			BOX 46
-436							40°		WITH DUSKY RED (10R 4/4) CINDERS AT 435.5		
-437							40°	3-5 mm	VESICLES BASALT, WITH PHENOCRYSTS VESICLES UP TO 5-8 mm, GENERALLY 1-5 mm, BLACK (N2.5)		
-438							20°				
-439							20°				
							90°				
							30°	1-2 mm	TRACE DUSKY RED (10R 4/4) AND YELLOWISH BROWN (10YR 5/4) ALONG FRACTURES		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-440		90									
-441			4.9/5.0 (98%)	4.6/5.0 (92%)			10°	1 mm	VESICULAR BASALT, VERY DARK GRAY (N3) WITH DUSKY RED (10R 3/2) IN VESICLES AND SOME FRACTURES VESICLES UP TO 10 mm GENERALLY 3-5 mm		
-442						10°	1 mm				
-443						70°	1 mm				
-444							1 mm				
-445		91				20°	1 mm				
-446			5.0/5.0 (100%)	5.0/5.0 (100%)		85°	2 mm				
-447						90°	3 mm				
-448						85°	1 mm				
-449						20°	1 mm				
-450		92	5.0/5.0 (100%)	4.8/5.0 (96%)		85°	1 mm				
						80°	1 mm			BOX 47	

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-451											
-452									FINE TO MEDIUM GRAINED BASALT, FEW 1 mm VESICLES, GRAY (N5) TO DARK GRAY (N4)		
-453							85°	1 mm			
-454							30°				
-455		93	5.0/5.0 (100%)	3.1/5.0 (62%)				10 mm	VOID WITH RUBBLE		BOX 48
-456							40°				
-457							70°		FINE TO MEDIUM GRAINED BASALT, DARK GRAY (N4) FEW VESICLES GREATER THAN 1 mm		
-458							70°		VERY FRACTURED		
-459							85°				
-460		94	5.0/5.0 (100%)	4.1/5.0 (82%)			60°		INCREASE IN VESICLE SIZE TO 1-3 mm		
-461							60°	1 mm			
							80°	1 mm			
							80°	1 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
Checked By: K. Esposito		Job No.: 1005746									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-462							60°	2 mm			
							85°	1 mm			
-463											
-464											
-465		95						5-40 mm	GRADES TO MEDIUM GRAINED BASALT, DARK GRAY (N4) VESICLES 3-8 mm WITH CINDERS OF DUSKY RED (10R 3/2)		BOX 48
-466			5.0/5.0 (100%)	4.5/5.0 (90%)			50°		CINDERS (20 cm) DUSKY RED (10R 3/2)		
							80°				
-467							80°				
-468							75°				
-469							40°		GRADES TO FINE GRAINED BASALT, DARK GRAY (N4), FEW VESICLES OVER 1 mm VERY BROKEN LOCALLY		
							10 cm				
-470		96					60°		INCREASE IN VESICLES SIZE TO 1-5 mm		
			5.0/5.0 (100%)	2.9/5.0 (58%)			60°				
-471							80°				
							80°				
-472							70°		VESICULAR BASALT, WITH VESICLES UP TO 10 mm GENERALLY 2-6 mm DARK GRAY (N4) WITH DUSKY RED (10R 3/2) IN VESICLES		
							40°				

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-473											
-474											
-475											
-476		97	1.0/1.0 (100%)	1.0/1.0 (100%)					BASALT, GRADES TO DUSKY RED (10R 3/3)		BOX 50
-477		98	3.7/4.0 (74%)	3.3/4.0 (66%)					BASALT, GRADES TO DARK GRAY (N4), VESICLES 2-5 mm		
-478											
-479									BROKEN TO RUBBLE		
-480									GRADES TO VERY FINE GRAINED OLIVINE BASALT, DARK GRAY (N4) FEW VESICLES TO 5 mm GENERALLY <1 mm.		
-481		99	5.0/5.0 (100%)	4.0/5.0 (80%)							
-482											
-483									FINE TO MEDIUM GRAINED BASALT, VESICLES 3-8 mm		BOX 51

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-484								1-2 mm			
-485		100	5 0/5 0 (100%)	4 8/5 0 (96%)							
-486							75°	1 mm	FINE GRAINED OLIVINE BASALT, DARK GRAY (N4) WITH FEW VESICLES 1-2 mm		4/26/08
-487											
-488									GRADES TO LARGER VESICLES OF 5-10 mm		
-489									20-25 mm VOID WITH CINDERS, RED (10R 4/6)		
-490		101	5 0/5 0 (100%)	4 6/5 0 (92%)			10°	2-3 mm			
-491							70°	2-3 mm	VESICULAR OLIVINE BASALT, DARK GRAY (N4) WITH TRACE RED (10R 4/6) LOCALLY VESICLES 2-5 mm		
-492							70°	2 mm			
-493							80°	4 mm			BOX 52
-493							80°	3 mm			
-494							20°	1 mm			
-494								3 mm			
-494								0-10°	VERY FRACTURED		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Vertical Angle:						
		Azimuth:			Checked By: K. Esposito						
		Job No.: 1005746			Logged By: B. Bragdon						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-495		102	5.0/5.0 (100%)	3.3/5.0 (66%)			70°		VESICULAR BASALT, DARK GRAY (N4) WITH SOME WEAK RED (10R 4/3) VESICLES UP TO 10 mm GENERALLY 2-5 mm, VERY FRACTURED 496.5'-498.5'		
-496						60°					
-497						40°					
-498						10°					
-499						80°					
-500						70°	1 mm				
-501		103	5.0/5.0 (100%)	3.3/5.0 (66%)			60°	1 mm	LARGER VESICLES FROM 501-504'; UP TO 10 mm, GENERALLY 2-5 mm WITH CINDERS OF WEAK RED (10R 4/3)		
-502						50°	1 mm				
-503						40°	3-10 mm				BOX 53
-504						40°					
-505		109	5.0/5.0 (100%)	4.8/5.0 (96%)			50°	1-3 mm	GRADES TO VERY FINE GRAINED BASALT, DARK GRAY (N4) WITH SOME DUSKY RED (10R 3/4) ALONG FRACTURES		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Job No.: 1005746						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-506											
-507							50°	1-3 mm			
-508							50°		GRADES TO GRAY (N5)		
-509											
-510		110	5.0/5.0 (100%)	3.3/5.0 (66%)			70°	5-10 mm	WITH CINDERS OF WEAK RED (10R 4/4)		
-511							70°		VESICULAR BASALT, DARK GRAY (N4), VESICLES 2-8 mm		BOX 54
-512							70°				
-513							50°	1 mm			
-514							80°		GRADES TO DUSKY RED (10R 3/3)		
-515							40 mm		VOID WITH CINDERS BLACK (N2.5) WITH SOME IRIDESCENCE LOCALLY		
-516		111	5.0/5.0 (100%)	5.0/5.0 (100%)			80 mm		VESICULAR BASALT, DARK GRAY (N4), VESICLES UP TO 10 mm GENERALLY 2-5 mm		
							85°		10x20 mm VOID		
									10x40 mm VOID		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-517							60°	1 mm			
-518											
-519							85°	1-2 m			
-520		112	5.0/5.0 (100%)	4.7/5.0 (94%)			85°				
-521							85°	1-2 m			BOX 56
-522							85°	1 mm	GRADES TO FINE GRAINED BASALT, DARK GRAY (N4) WITH 1-3 mm VESICLES, GENERALLY 1 mm		
-523											
-524							70°	1 mm			
-525		113	5.0/5.0 (100%)	4.6/5.0 (92%)			85°	1 mm			
-526							85°	1 mm	BASALT, AS ABOVE WITH TRACE DUSKY RED (10R 3/2) LOCALLY ALONG FRACTURES		
-527							75°	1 mm			
							90°	1 mm			
							80°	2 mm			
									FEW VUGS UP TO 10 mm		

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-528											
-529									VESICULAR BASALT, DARK GRAY (N4) FINE GRAINED, 1-3 mm VESICLES		
-530		114	5.0/5.0 (100%)	5.0/5.0 (100%)					FEW VUGS TO 8 mm		BOX 56
-531											
-532								5-10 mm VOID			
-533								85° 2 mm	GRADES TO MEDIUM GRAINED BASALT, DARK GRAY (N4) TO BLACK (N2.5) WITH VESICLES 5-10 mm CINDERS RED (10R 4/6) COATING AND IN FRACTURE		
-534								85° 2 mm			
-535		115	5.0/5.0 (100%)	4.1/5.0 (82%)				80° 3 mm	BB GRADES TO FINE GRAINED BASALT, WITH VESICLES 1-2 mm		
-536								1-2 mm			
-537								85° 2 mm			
-538								90° 1 mm	GRADES TO MEDIUM GRAINED BASALT, WITH VESICLES		

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
Checked By: K. Esposito		Job No.: 1005746									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-539								70° 2 mm	RUBBLE 3-5 mm, DARK GRAY (N4) WITH DUSKY RED (10R 3/3) LOCALLY		
-540		116	5.0/5.0 (100%)	2.7/5.0 (54%)				70° 5 mm			BOX 57
-541								70° 2 mm	FINE TO MEDIUM GRAINED BASALT, WEAK RED (10R 4/3), VESICLES UP TO 10 mm		
-542								50° 2 mm			
-543								10° 20° 2-3 mm			
-544											
-545		117	5.0/5.0 (100%)	5.0/5.0 (100%)				60° 2 mm	BASALT, GRADES TO DUSKY RED (10R 3/2) SMALL VESICLES APPROX 1 mm FEW 3-4 mm		
-546									FINE GRAINED BASALT, DARK GRAY (N4) TO BLACK (N2.5) WITH SMALL VESICLES 1-2 mm		
-547											
-548									FEW HORIZONTAL ZONES OF VESICLES 3-8 mm		
-549								85° 1 mm			BOX 58

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TEST P-3 K0158ED4

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
						Sheet No.: 51 of 67				
						Job No.: 1005746				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
550		118	5.0/5.0 (100%)	4.9/5.0 (98%)						
551										
552						40°	1 mm			
553						90°				
554						30°				
555		119	4.9/5.0 (98%)	4.6/5.0 (92%)		30°		GRADES TO LARGER VESICLES AND DUSKY RED (10R 4/4)		
556						85°				
557						80°	1 mm	VESICULAR BASALT, VERY DARK GRAY (N3) WITH SOME DUSKY RED (10R 3/3) LOCALLY, WITH VESICLES UP TO 10 mm GENERALLY 2-5 mm		
558						85°				BOX 59
559						80°	1-2 m			
560		120	5.1/5.0 (102%)	4.8/5.0 (96%)		85°	1 mm			
						30°	1-2 m	FEW HORIZONTAL VUGS		
						75°	1 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Sheet No.: 52 of 67					
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Job No.: 1005746					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Northing: 698,178.53		Vertical Angle:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Easting: 584,480.21		Azimuth:					
				Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-561											
-562							60°	1 mm	FINE GRAINED VESICULAR BASALT, VERY DARK GRAY (N3) WITH VESICLES 1-2 mm		
-563											
-564											
-565		121	4.9/5.0 (98%)	2.3/5.0 (46%)			80°		GRADES TO BLACK (N2.5) BASALT, WITH ABUNDANT 2-5 mm VESICLES, VERY FRACTURED RUBBLE WITH CINDERS DUSKY RED (10R 3/4)		
-566							70°				
-567									RUBBLE WITH CINDERS DUSKY RED (10R 3/4)		BOX 60
-568							60°				
-569							50°				
-570		122					40°		FRACTURED TO RUBBLE		
-571			5.0/5.0 (100%)	4.7/5.0 (94%)			10°		BLACK (N2.5) BASALT, WITH ABUNDANT 1-2 mm VESICLES		
							80°	2 mm			
							70°	1 mm			

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
572						90°				
-573										
-574						85°	10 mm	SOME RUBBLE		
-575						85°	1 mm			
-576		123	5.0/5.0 (100%)	4.6/5.0 (92%)		40°				
-577						80°	1.2 mm	FINE GRAINED BASALT, VERY DARK GRAY (N3), VESICLES APPROX 1 mm OR LESS WITH HORIZONTAL VUGS/VESICLES		BOX 61
-578						75°	1-2 mm	HORIZONTAL VUGS/VESICLES		
-579										
-580		124	5.0/5.0 (100%)	5.0/5.0 (100%)				HORIZONTAL VUGS/VESICLES		
-581										
-582						90°	1 mm	HORIZONTAL VUGS/VESICLES		

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
583										
584								HORIZONTAL VUGS/VESICLES		
585		125	5.0/5.0 (100%)	5.0/5.0 (100%)			5 mm			4/27/08
586								FINE GRAINED BASALT, DARK GRAY (N3), VESICLES LESS THAN 1 mm, FEW VUGS AND HORIZONTAL VESICLES WITH HORIZONTAL VUGS/VESICLES		BOX 62
587							1.2 mm			
588										
589							2.5 mm	0-10° WITH 2.5 mm FRACTURES		
590		126	5.0/5.0 (100%)	5.0/5.0 (100%)						
591								HORIZONTAL VUGS VESICULATED BASALT, <1 mm 20° FRACTURE OFF VERTICAL FRACTURE		
592								FRACTURE 2-3 mm		
593										

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
594											
595		127	5.0/5.0 (100%)	2.4/5.0 (48%)				50"			BOX 63
596								20"	FINE GRAINED OLIVINE BASALT, DARK GRAY (N3) WITH SMALL VESICLES LESS THAN 1 mm, TRACE HORIZONTAL OF BANDED FINE GRAINED MATERIAL		
597								40"			
598								50"			
599								50"	VERY FRACTURED		
600		128	5.0/5.0 (100%)	3.4/5.0 (68%)				50"			
601								70"	FINE GRAINED OLIVINE BASALT, AS ABOVE, VERY FRACTURED LOCALLY, FRACTURES 1-5 mm		
602								30"			
603								50"			
604								40"			
								60"			BOX 64
								3 mm			
								50"			

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MWH		ROCK BORING LOG				Hole No.: GW-1					
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Core Barrel: HQ x 5'		Easting: 584,480.21		Azimuth:			
Drill Rig: Rotary Core		Ground Elev.: 5176.32									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
605		129	5.0/5.0 (100%)	5.0/5.0 (100%)							
606							85°	1 mm	FINE GRAINED OLIVINE BASALT, DARK GRAY (N4), VESICLES LESS THAN 1 mm	TEST P-2 K ₁ =2.0E-04	
607							50°	1 mm			
608							50°	2 mm			
609							20°	2 mm			
610		130	5.0/5.0 (100%)	5.0/5.0 (100%)							
611							30°	1 mm			
612											
613							30°	1 mm			BOX 65
614											
615		131	5.0/5.0 (100%)	3.7/5.0 (74%)							

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
Checked By: K. Esposito		Job No.: 1005746									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
616								0-10" 5 mm			
617							50°	1-2 mm	GRADES TO FINE TO MEDIUM GRAINED OLIVINE BASALT, DUSKY RED (2.5R 3/2) WITH ABUNDANT VESICLES UP TO 10 mm	TEST P-1 K ₁₀ = 1.8E-04	
618							60°	2-3 mm			
619							10-20"				
620		132							RUBBLE		
621			5.0/5.0 (100%)	4.6/5.0 (92%)			40°	1 mm			
622							30°	3-4 mm			BOX 66
623									VUGS/VESICLES UP TO 40 mm		
624								1 mm			
625		133	5.0/5.0 (100%)	4.2/5.0 (84%)				3 mm	BASALT, GRADES TO DARK REDDISH GRAY (10R 3/1) AND VESICLES LESS THAN 1 mm		
626								1 mm	BASALT, GRADES TO DARK GRAY (N4)		
							75°				
							40°				

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MWH		Project: Areva Feature: Core Log			Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:			
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32					
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
627						80° 1 mm			
628						10° 70° 20° 1-3 mm			
629						80°			
630		134					10x40 mm VOID		
631			5.0/5.0 (100%)	5.0/5.0 (100%)					BOX 67
632									
633							20 x 30 mm VOID		
634									
635		135	5.0/5.0 (100%)	5.0/5.0 (100%)					
636						80° 2-3 cm			
637							BASALT, DUSKY RED (10R 3/3) GRADES TO LARGER VESICLES		

1005746D013-A.dwg

MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
638											
639								10° 1-2 mm	BASALT, GRADES TO FINE GRAINED DARK GRAY (N4). VESICLES LESS THAN 1 mm VESICLES 2-5 mm LOCALLY		
640		136									BOX 68
641			5.0/5.0 (100%)	5.0/5.0 (100%)							
642									2-5 mm VESICLES		
643											
644											
645		137	5.0/5.0 (100%)	3.2/5.0 (64%)							4/28/08
646											
647								30° 1-2 mm	WITH HORIZONTAL VESICLES UP TO 5 mm		
648								70° 1 mm			
								80° 1 mm			
								90° 1 mm			

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
649										
650		138	1.0/1.0 (100%)	0.6/1.0 (60%)			1 mm	VERY FINE GRAINED OLIVINE BASALT, DARK GRAY (N4) VESICLES OF 1 mm		BOX 69
651							1 mm			
652		139	4.0/4.0 (100%)	3.4/4.0 (85%)			1.2 mm			
653										
654										
655		140	1.0/1.0 (100%)	1.0/1.0 (100%)				AS ABOVE		
656		141	1.0/1.0 (100%)	1.0/1.0 (100%)						
657		142	3.0/3.0 (100%)	3.0/3.0 (100%)						
658										
659							1 mm	WITH WEAK RED (10R 4/3) ALONG FRACTURE		BOX 70

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1					
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
660		143	5.0/5.0 (100%)	5.0/5.0 (100%)					VERY FINE GRAINED BASALT, DARK GRAY (N4) TRACE VESICLES GREATER THAN 1 mm, GENERALLY LESS THAN 1 mm		
661							85°	1 mm			
662											
663											
664											
665		144							WITH TRACE 5 mm VESICLES		
666			5.0/5.0 (100%)	3.0/5.0 (75%)							
667							50°		WITH FEW 5-10 mm VESICLES FRACTURED TO RUBBLE WITH TRACE CINDERS OF WEAK RED (10R 4/4)		
668									FINE TO MEDIUM GRAINED BASALT, WEAK RED (10R 4/2), VESICLES 5-10 mm, SOME PHENOCRYSTS	BOX 71	
669											
670		145	5.0/5.0 (100%)	5.0/5.0 (100%)			85°	1 mm	GRADES TO DARK GRAY (N4) WITH FEW VESICLES UP TO 10 mm, GENERALLY 1-3 mm		

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MWH		Project: Areva Feature: Core Log			ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito					
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:					
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:					
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32							
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
671								2 mm			
672							85°				
673							85°	1 mm			
674							70°	1 mm			
675							85°	1 mm	FINE GRAINED BASALT, DARK GRAY (N4) VESICLES 1 mm OR LESS		
676		146	5.0/5.0 (100%)	4.8/5.0 (96%)					WITH FEW VESICLES UP TO 10 mm		
677											
678											BOX 72
679											
680		147	5.0/5.0 (100%)	2.5/5.0 (50%)					RUBBLE WITH SOME WEAK RED (10R 4/4)		
681							80°		GRADES TO DARK REDDISH GRAY (10Y 4/1) WITH VESICLES OF UP TO 2 mm		
							85°	1 mm			
							60°	1 mm			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito			
Feature: Core Log		Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:			
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Core Barrel: HQ x 5'		Easting: 584,480.21		Azimuth:			
Drill Rig: Rotary Core		Ground Elev.: 5176.32									
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Feet	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-682							40°				
-683							40°	1-2 mm			
-684							40°		VERY BROKEN, DARK REDDISH GRAY (10Y 4/1) TO DARK GRAY (N4)		
-685							10°		VERY FRACTURED 683.5-687'		
-686		148	5.0/5.0 (100%)	2.9/5.0 (58%)			40°				
-687							40°		SOME WEAK RED (10R 4/3) IN FRACTURES LOCALLY		
-688									WITH VUGS UP TO 20 mm		BOX 73
-689							85°	2-3 mm			
-690		149	5.0/5.0 (100%)	4.3/5.0 (86%)			10°				
-691							80°		BASALT, GRADES TO DARK REDDISH GRAY (10Y 4/1) WITH ABUNDANT 2-4 mm VESICLES, SOME VESICLES UP TO 15 mm LOCALLY		
-692							70°	1-2 mm			
							50°				
							70°		BASALT, GRADES TO FINE GRAINED DARK GRAY (N4), VESICLES GENERALLY 1 mm		
							80°				

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Azimuth:						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Job No.: 1005746						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
693								0-10"			
694								2-3 mm	BASALT, GRADES TO DARK GRAY (N4) WITH WEAK RED (10R 4/2) ALONG FRACTURES		
695		150	5.0/5.0 (100%)	3.8/5.0 (76%)				70"	RUBBLE WEAK RED (10R 4/2)		
696								30"	RUBBLE		
697											BOX 74
698								40"			
699									VUGS/VOIDS UP TO 15 mm		
700		151							2 x 35 mm VOID		
701			5.0/5.0 (100%)	5.0/5.0 (100%)				30"			
702									FINE GRAINED BASALT, DARK GRAY (N4) WITH VUGS/VOIDS UP TO 15 mm		
703								80"			
								1 mm			
								70"			
								2 mm	10 x 30 mm VOID		

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MWH		Project: Areva Feature: Core Log		ROCK BORING LOG		Hole No.: GW-1				
Date Started: 4/21/08		Date Completed: 5/8/08		Logged By: B. Bragdon		Checked By: K. Esposito				
Total Depth (ft): 730.5		Depth to Water (ft):		Northing: 698,178.53		Vertical Angle:				
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux		Easting: 584,480.21		Azimuth:				
Drill Rig: Rotary Core		Core Barrel: HQ x 5'		Ground Elev.: 5176.32						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-704										
-705		152	4.8/5.0 (96%)	4.8/5.0 (96%)				WITH VUGS AND VOIDS UP TO 15 mm VESICULATED BASALT, WITH VESICLES UP TO 20 mm	4/29/08	
-706										BOX 75
-707							30° 1-2 mm			
-708										
-709										
-710		153	5.0/5.0 (100%)	1.0/5.0 (20%)				HIGHLY FRACTURED BASALT, HORIZONTAL AND VERTICAL FRACTURES		
-711										
-712							40°			
-713							40°			
-714							20°			
							20°			
							30°			

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
		Ground Elev.: 5176.32			Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	ROD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-715		154	5.0/5.0 (100%)	1.0/5.0 (20%)					HIGHLY FRACTURED BASALT, FRACTURE 1-2 mm		
-716							40°				BOX 76
-717							50°				
-718							40°				
-719											
-720		155	5.0/5.0 (100%)	4.5/5.0 (90%)			40°		SLIGHTLY VESICULAR BASALT, WITH VESICLES GENERALLY 1 mm		
-721							30°				
-722							50°				
-723											
-724							20°				
-725		156	5.0/5.0 (100%)	2.5/5.0 (50%)			50°				
-725							40°				

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MWH		ROCK BORING LOG			Hole No.: GW-1						
Project: Areva		Date Started: 4/21/08			Date Completed: 5/8/08						
Feature: Core Log		Total Depth (ft): 730.5			Depth to Water (ft):						
Drilling Contr.: Crux Subsurface, Inc.		Driller: Brandon Gereaux			Northing: 698,178.53						
Drill Rig: Rotary Core		Core Barrel: HQ x 5'			Easting: 584,480.21						
					Ground Elev.: 5176.32						
					Checked By: K. Esposito						
					Vertical Angle:						
					Azimuth:						
Depth (ft)	Elevation (ft)	Run No.	Recovery (%)	RQD (%)	Fractures/Foot	Lithology (Graphic Symbol)	Structure	Fracture Spacing	Lithologic Descriptions	Packer Test	Notes and Observations (Sample / Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
-726									VUGS 1 mm		
-727											
-728									VISCULATED BASALT, VUGS 1-20 mm		
-729											
-730									TOTAL DEPTH 730.5'		
-731											
-732											
-733											
-734											
-735											
-736											

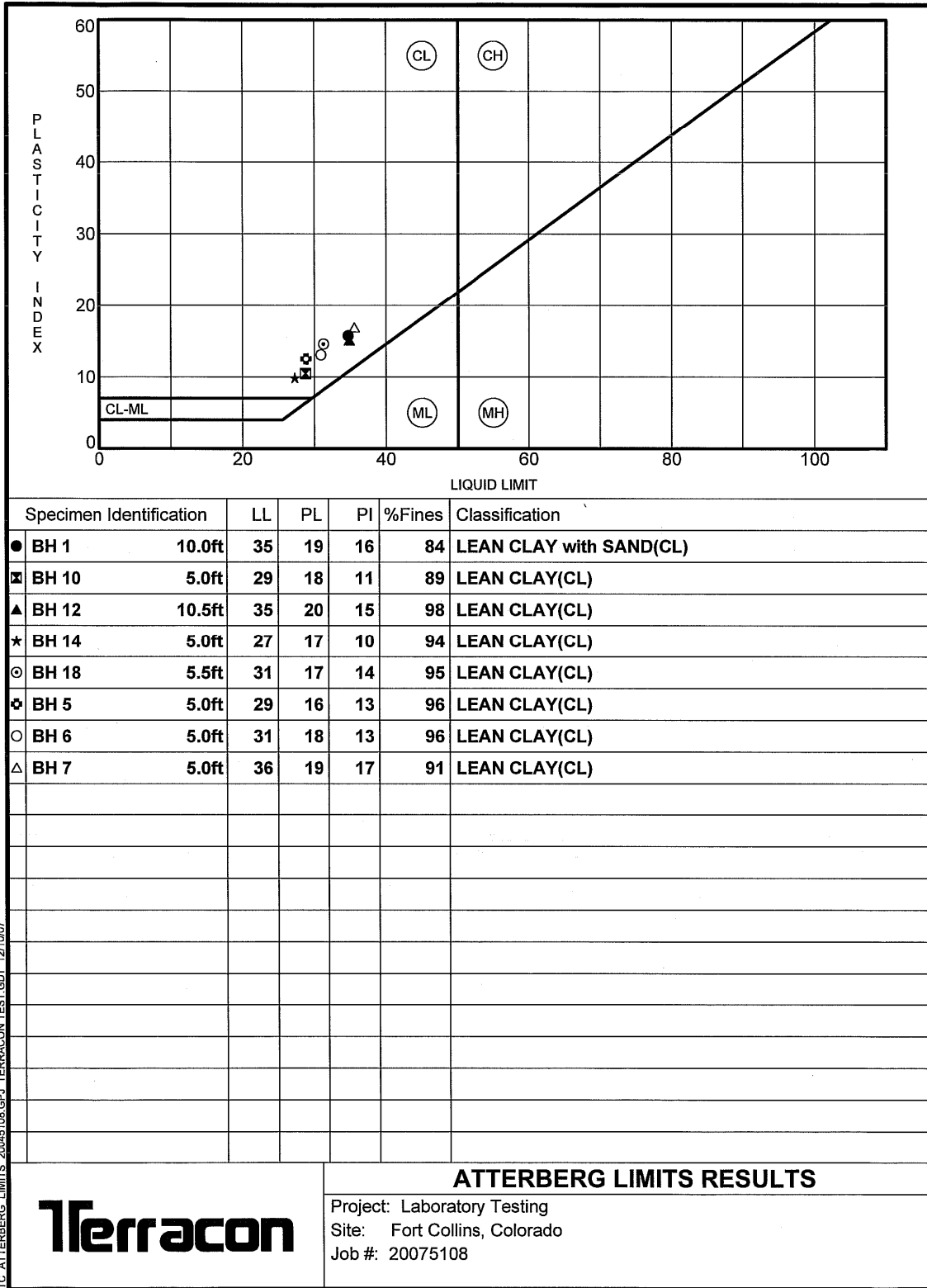
1005746D014--A.dwg

8.0 LABORATORY RESULTS

8.1 NOVEMBER 2007 RESULTS

- Summary Table
- Atterberg Limits
- Grain Size Analysis
- Grain Size Analysis with Hydrometer
- Consolidation

Specific Gravity	ASTM D854-06
Natural Moisture Content	ASTM D2216-98
Natural Dry Density	ASTM D2216-98
Grain Size Analysis	ASTM D422-63R02
Atterberg Limits	ASTM D4318-00
Consolidation	ASTM D2435-02
Proctor Compaction (Modified)	ASTM D1557-02
Resistance R-Value	ASTM D2844-01
Water Soluble Sulfate	AASHTO T290-95-UL (2003)
Resistivity	AASHTO T288-91-UL (2004)
pH	AASHTO T289-91-UL (2004)

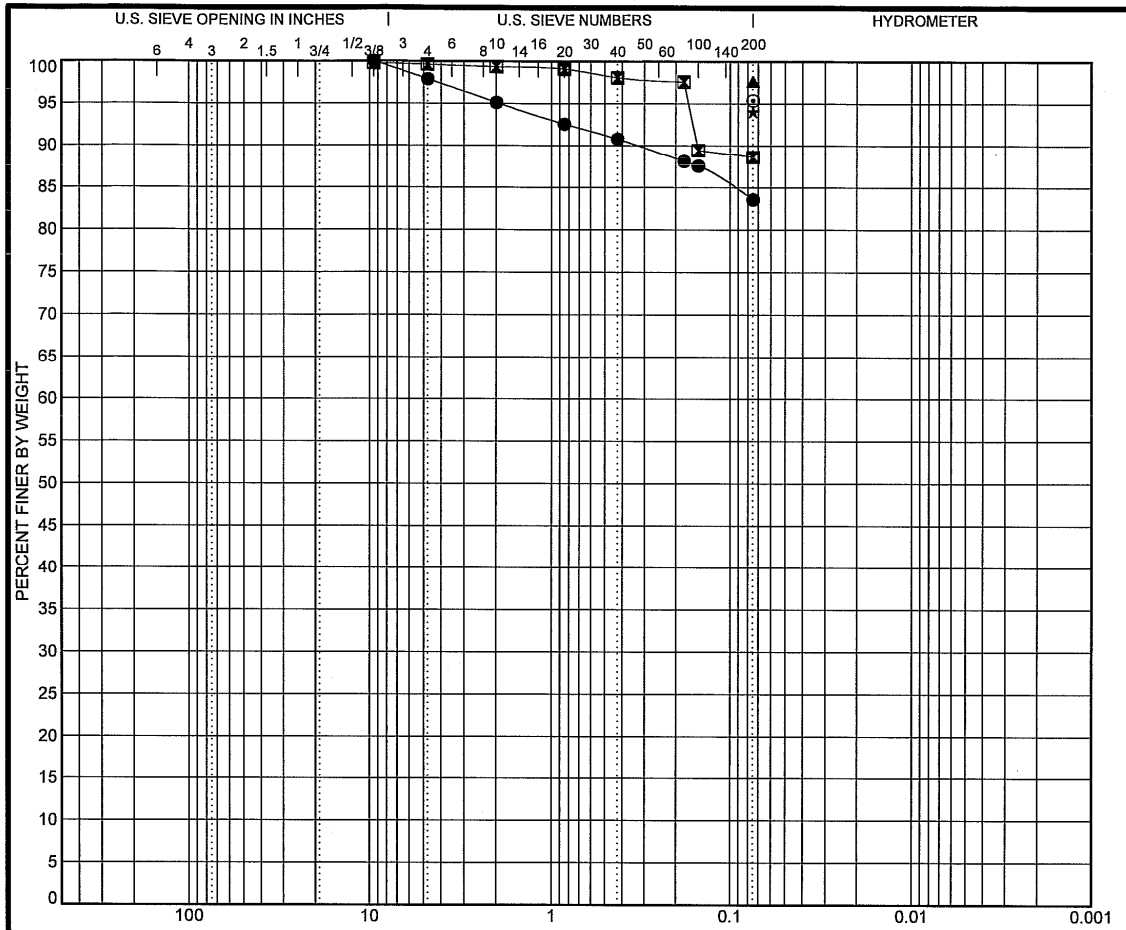


TC ATTERBERG LIMITS 20045108.GPJ TERRACON TEST.GDT 12/10/07



ATTERBERG LIMITS RESULTS

Project: Laboratory Testing
 Site: Fort Collins, Colorado
 Job #: 20075108



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● BH 1 10.0ft	LEAN CLAY with SAND(CL)	35	19	16		
☒ BH 10 5.0ft	LEAN CLAY(CL)	29	18	11		
▲ BH 12 10.5ft	LEAN CLAY(CL)	35	20	15		
★ BH 14 5.0ft	LEAN CLAY(CL)	27	17	10		
◎ BH 18 5.5ft	LEAN CLAY(CL)	31	17	14		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● BH 1 10.0ft	9.5				2.1	14.3	83.6	
☒ BH 10 5.0ft	9.5				0.1	11.0	88.6	
▲ BH 12 10.5ft	0.075				0.0	0.0	97.6	
★ BH 14 5.0ft	0.075				0.0	0.0	94.0	
◎ BH 18 5.5ft	0.075				0.0	0.0	95.4	

TC GRAIN SIZE 20045108.GPJ TERRACON TEST.GDT 12/10/07

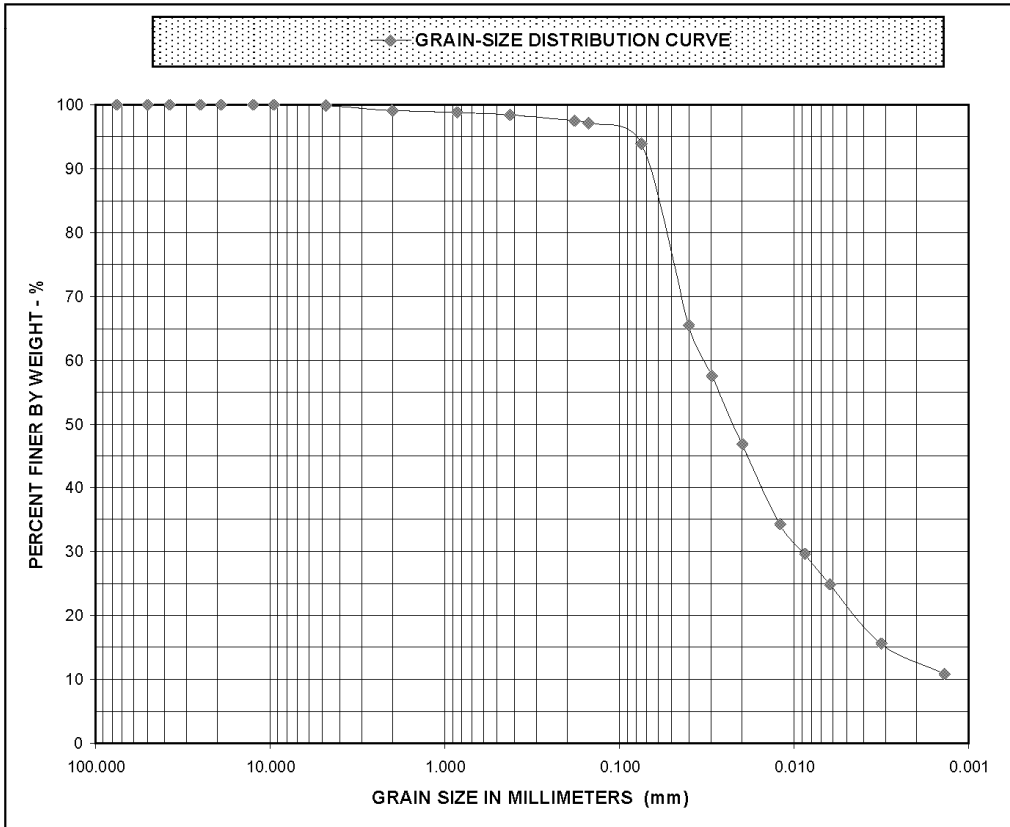
	GRAIN SIZE DISTRIBUTION
	Project: Laboratory Testing
	Site: Fort Collins, Colorado
	Job #: 20075108
	Date:



301 North Howes Street
 Fort Collins, Colorado 80521
 (970) 484-0359 FAX (970) 484-0454

CLIENT: MWH
 PROJECT:
 PROJECT LOCATION:
 SAMPLE LOCATION: BH-5 @ 5'

SAMPLED BY: Client
 DATE RECEIVED: 3-Dec-07
 REPORT DATE: 10-Dec-07
 PROJECT NO: 20075108

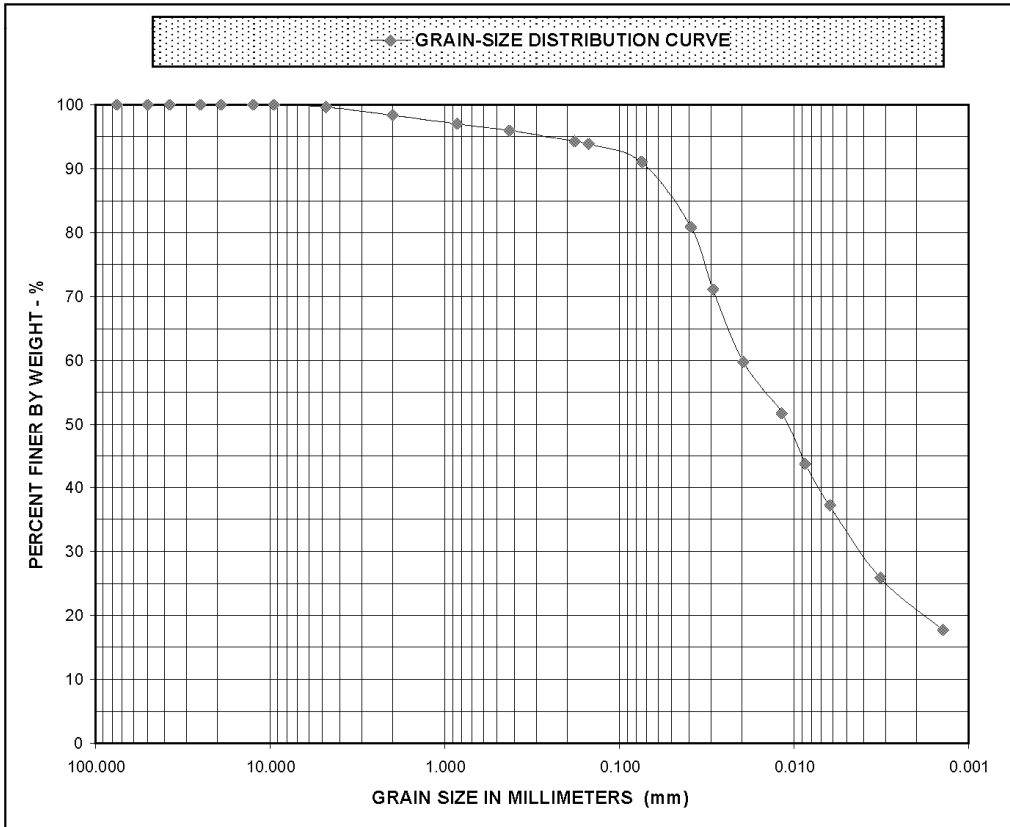


SAMPLE LOCATION	SOIL CLASSIFICATION	MC%	LL	PI	Cc	Cu
BH-5 @ 5'	CL	NR	29	13	1.94	25.90

SAMPLE LOCATION	D100	D60	D30	D10	% GRAVEL	% SAND	% SILT	% CLAY
BH-5 @ 5'	9.500	0.033	0.009	0.001	0.2	6.0	72.7	21.1

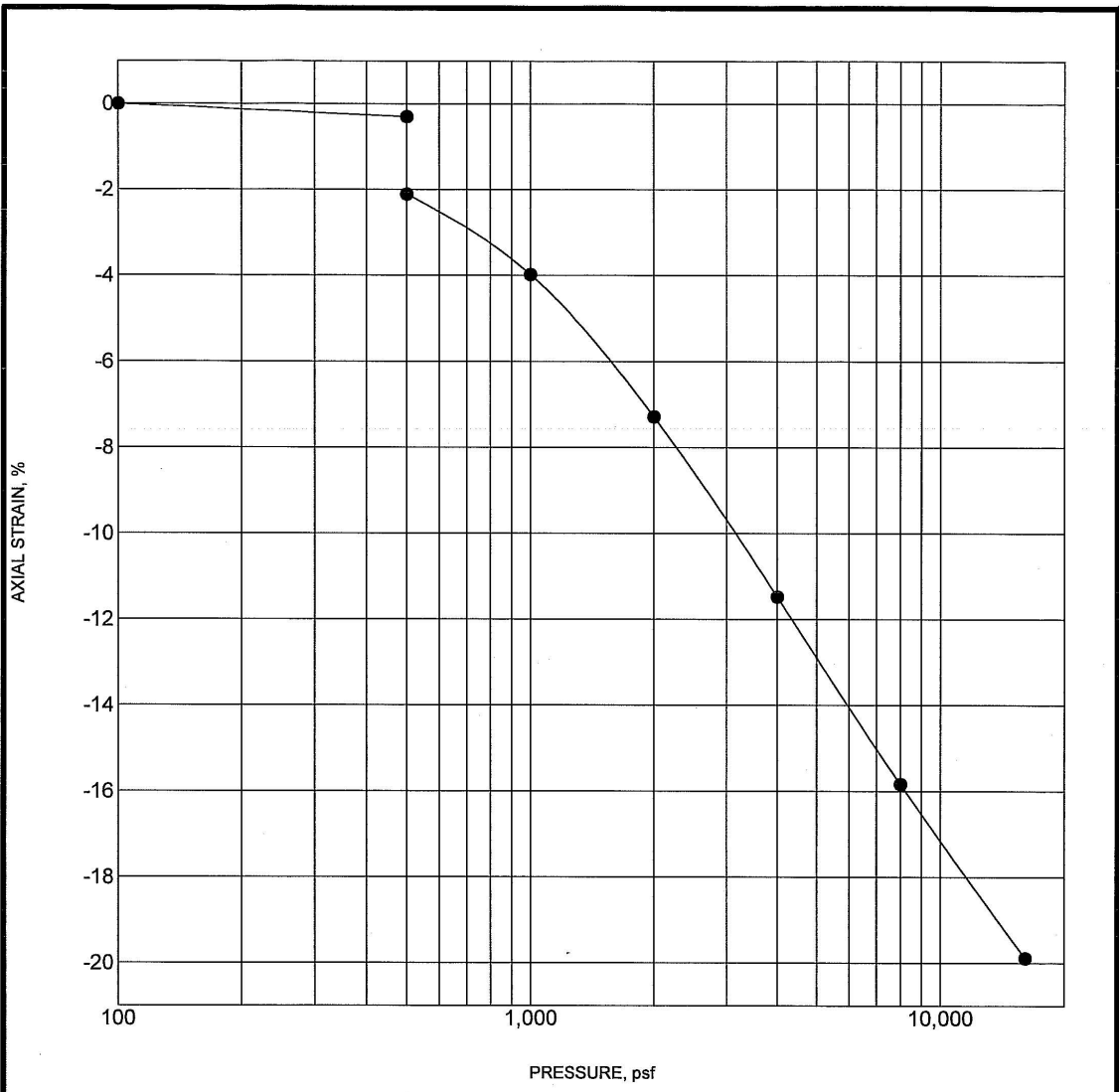
CLIENT: MWH
 PROJECT:
 PROJECT LOCATION:
 SAMPLE LOCATION: BH-18 @ 5.5'

SAMPLED BY: Client
 DATE RECEIVED: 3-Dec-07
 REPORT DATE: 10-Dec-07
 PROJECT NO: 20075108



SAMPLE LOCATION	SOIL CLASSIFICATION	MC%	LL	PI	Cc	Cu
BH-18 @ 5.5'	CL	NR	31	14	#N/A	#N/A

SAMPLE LOCATION	D100	D60	D30	D10	% GRAVEL	% SAND	% SILT	% CLAY
BH-18 @ 5.5'	9.500	0.020	0.004	#N/A	0.4	8.6	58.5	32.5

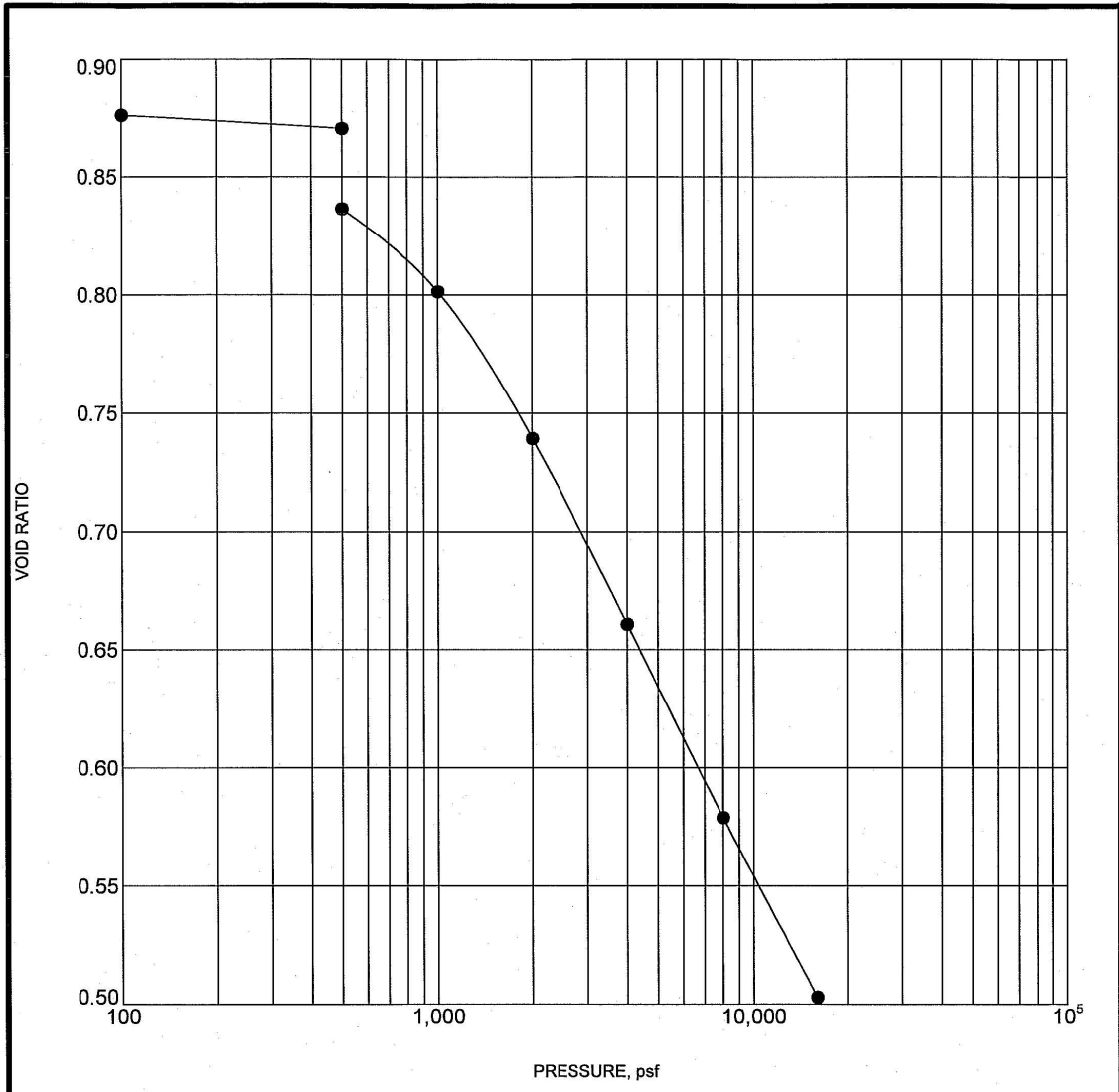


TC CONSOL. STRAIN 20045108.GPJ TERRACON TEST.GDT 12/10/07

Specimen Identification	Classification	γ_d , pcf	WC, %
● BH 12 10.5ft	LEAN CLAY(CL)	88	12

Notes:

	SWELL CONSOLIDATION TEST
	Project: Laboratory Testing Site: Fort Collins, Colorado Job #: 20075108 Date:



TC CONSOL. VOID RATIO 20045108.GPJ TERRACON TEST.GDT 12/10/07

Specimen Identification	Classification	γ_d , pcf	WC, %
● BH 12 10.5ft	LEAN CLAY(CL)	88	12

Notes:

	CONSOLIDATION TEST
	Project: Laboratory Testing Site: Fort Collins, Colorado Job #: 20075108

8.0 LABORATORY RESULTS

8.2 MAY 2008 RESULTS

- Summary Table
- Atterberg Limits
- Consolidation
- Proctor Compaction
- Resistance R-Value

Specific Gravity	ASTM D854-06
Natural Moisture Content	ASTM D2216-98
Natural Dry Density	ASTM D2216-98
Grain Size Analysis	ASTM D422-63R02
Atterberg Limits	ASTM D4318-00
Consolidation	ASTM D2435-02
Proctor Compaction (Modified)	ASTM D1557-02
Resistance R-Value	ASTM D2844-01
Water Soluble Sulfate	AASHTO T290-95-UL (2003)
Resistivity	AASHTO T288-91-UL (2004)
pH	AASHTO T289-91-UL (2004)

Sheet 1 of 1

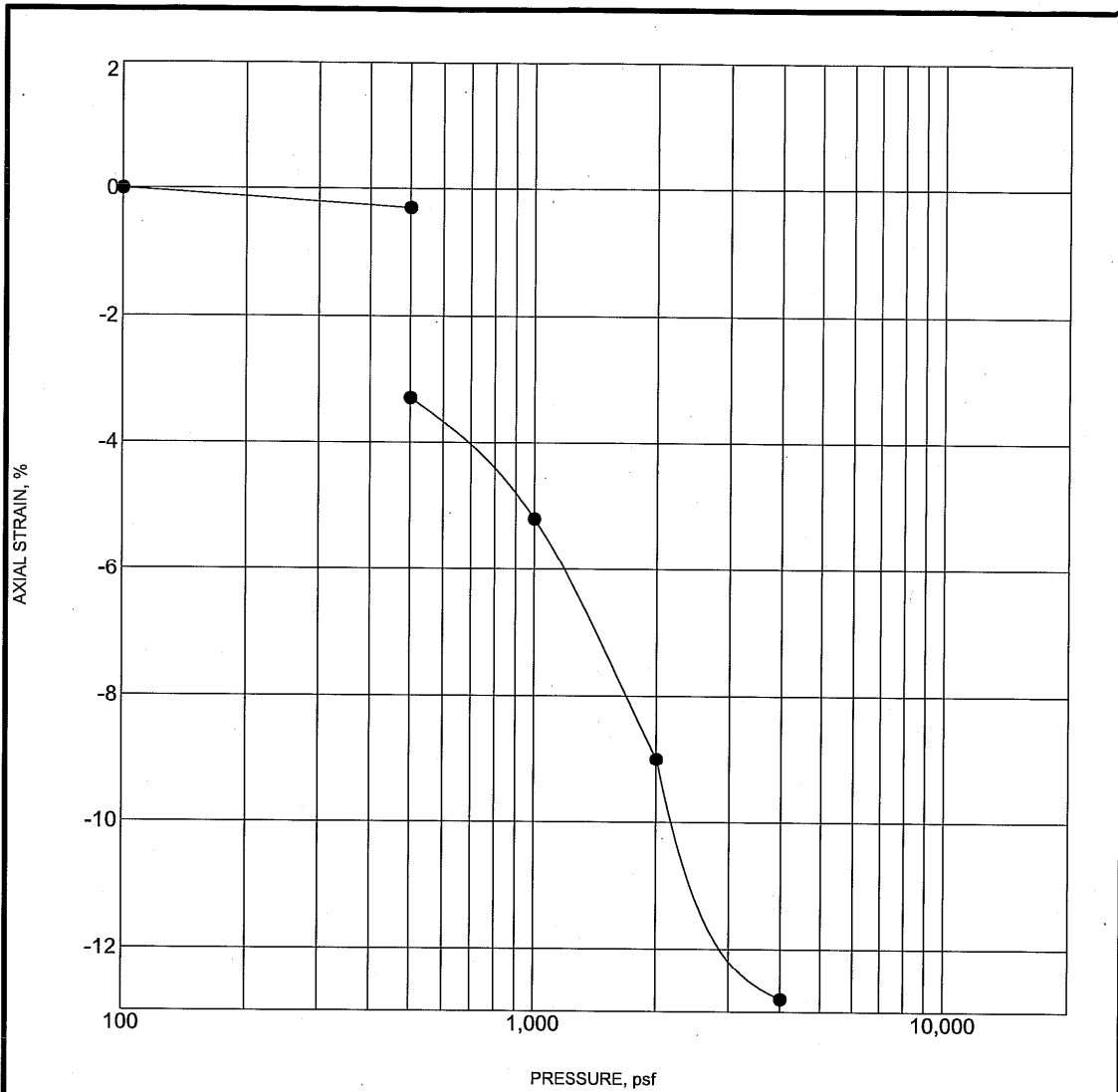
Borehole	Depth	Liquid Limit	Plasticity Index	% < #200 Sieve	AASHTO Classification	USCS Classification	Water Content (%)	Dry Unit Weight (pcf)	Swell (%) / Surcharge (psf)	Unconfined Compressive Strength (psf)	Water Soluble Sulfate (ppm)	Resistivity (OHM-CM)	PH	Oxidation Reduction Potential	Specific Gravity
22	5.0						16.3								
23	1.0	36	12	89	A-6	CL									
23	5.0	33	14	87	A-6	CL					100	1229	8.36		2.69
25	5.5	42	24	86	A-7-6	CL	14.9				1700	245	8.36		2.70
28	5.0						10.6								
29	5.5						13.0	81.2	-3.0/500						
29	10.0						16.0								
30	5.5	35	16	97	A-6	CL	10.7	90.4	-0.4/500						
30	10.5						12.7								
30	15.5						14.7								
30	20.5						19.0								

PC LAB SUMMARY 20075108.GPJ BORING 022208.GDT 6/17/08

Terracon

SUMMARY OF LABORATORY RESULTS

Project: AREVA Idaho Falls Site-Laboratory Testing
 Site: AREVA Idaho Falls Site Idaho Falls, Idaho
 Job #: 20075108
 Date: 6-17-08

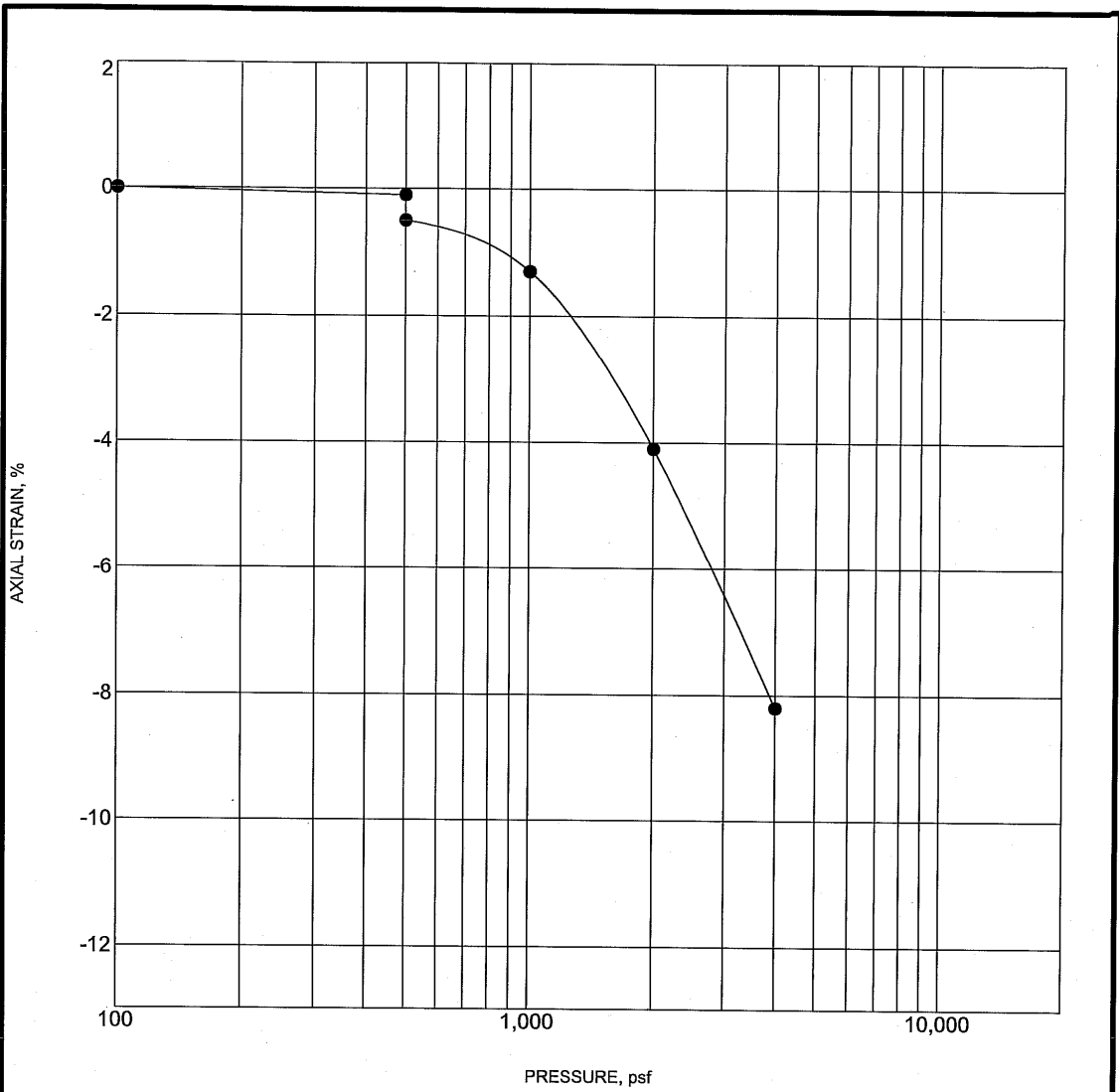


Specimen Identification		Classification	γ_d , pcf	WC, %
● 29	5.5ft	LEAN CLAY (CL)	81	13

Notes:

TC CONSOL STRAIN 20075108.GPJ BORING.GDT 6/13/08

	SWELL CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108 Date:

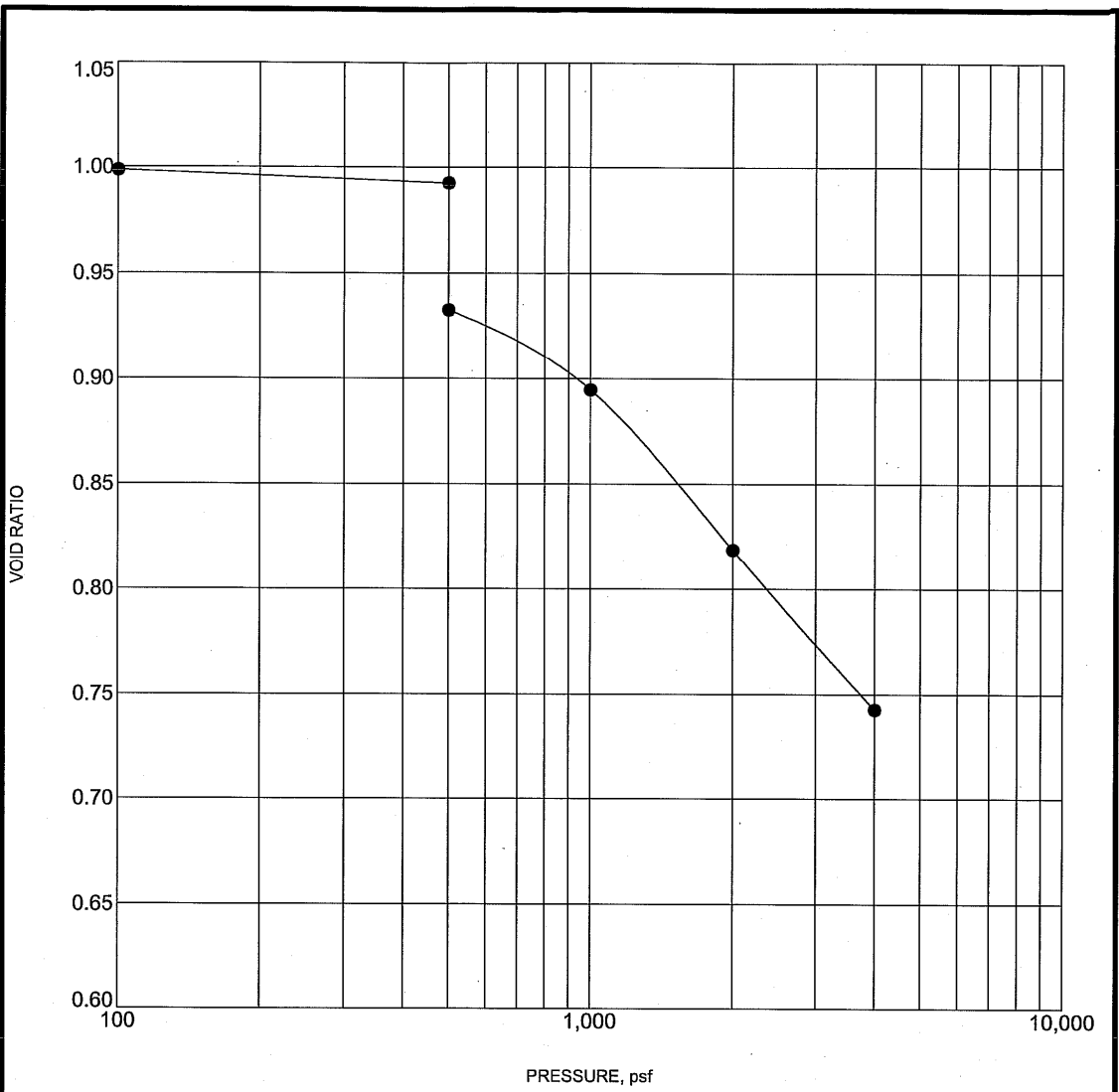


Specimen Identification		Classification	γ_d , pcf	WC, %
●	30 5.5ft	LEAN CLAY(CL)	90	11

Notes:

TC CONSOL. STRAIN 20075-08.GPJ BORING.GDT 6/13/08

	SWELL CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108 Date:

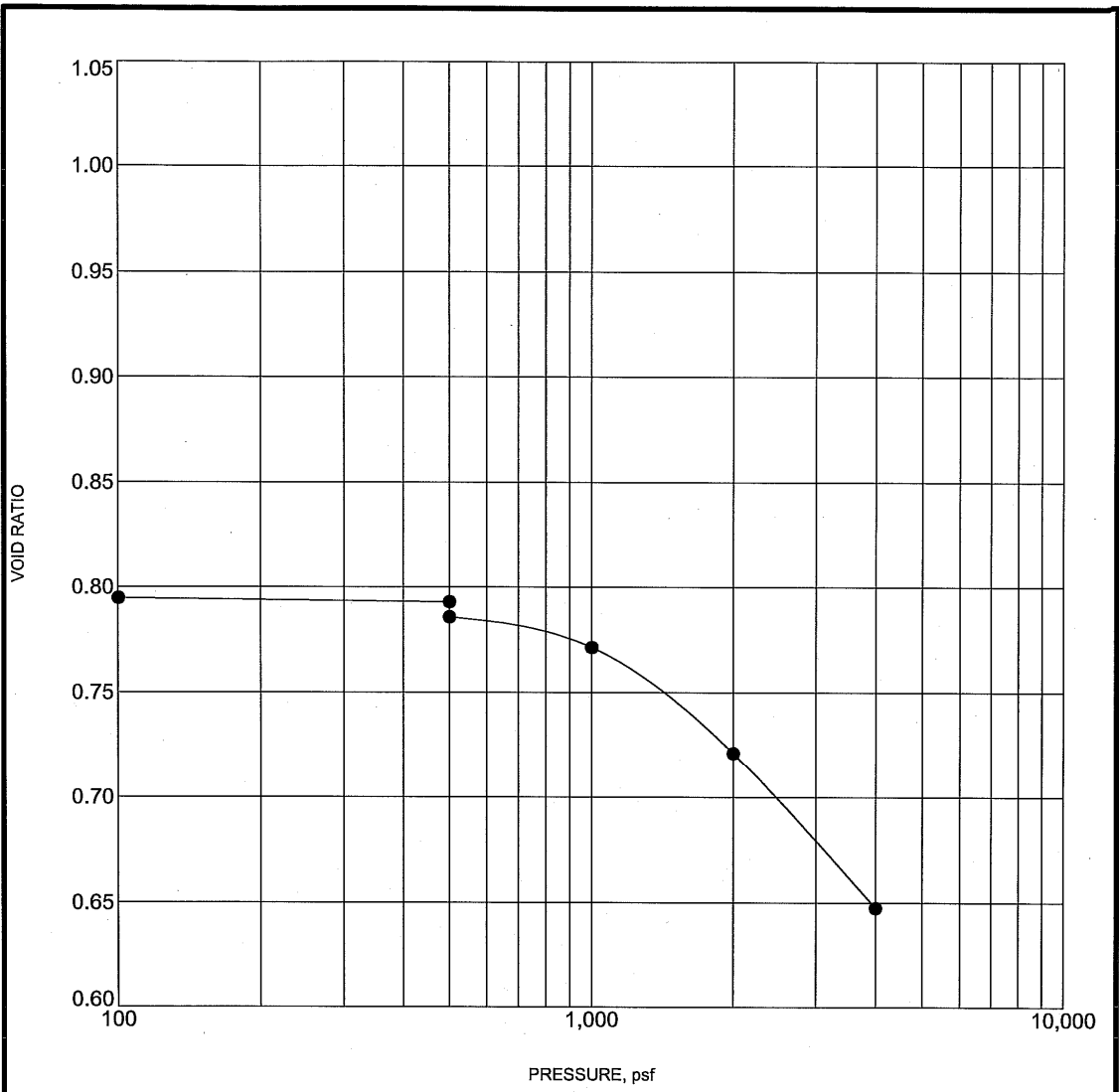


TG CONSOL. VOID. RATIO. 20075108.GPJ BORING.GDT 6/13/08

Specimen Identification	Classification	γ_d , pcf	WC, %
● 29 5.5ft	LEAN CLAY (CL)	81	13

Notes:

	CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108



Specimen Identification	Classification	γ_d , pcf	WC, %
● 30 5.5ft	LEAN CLAY(CL)	90	11

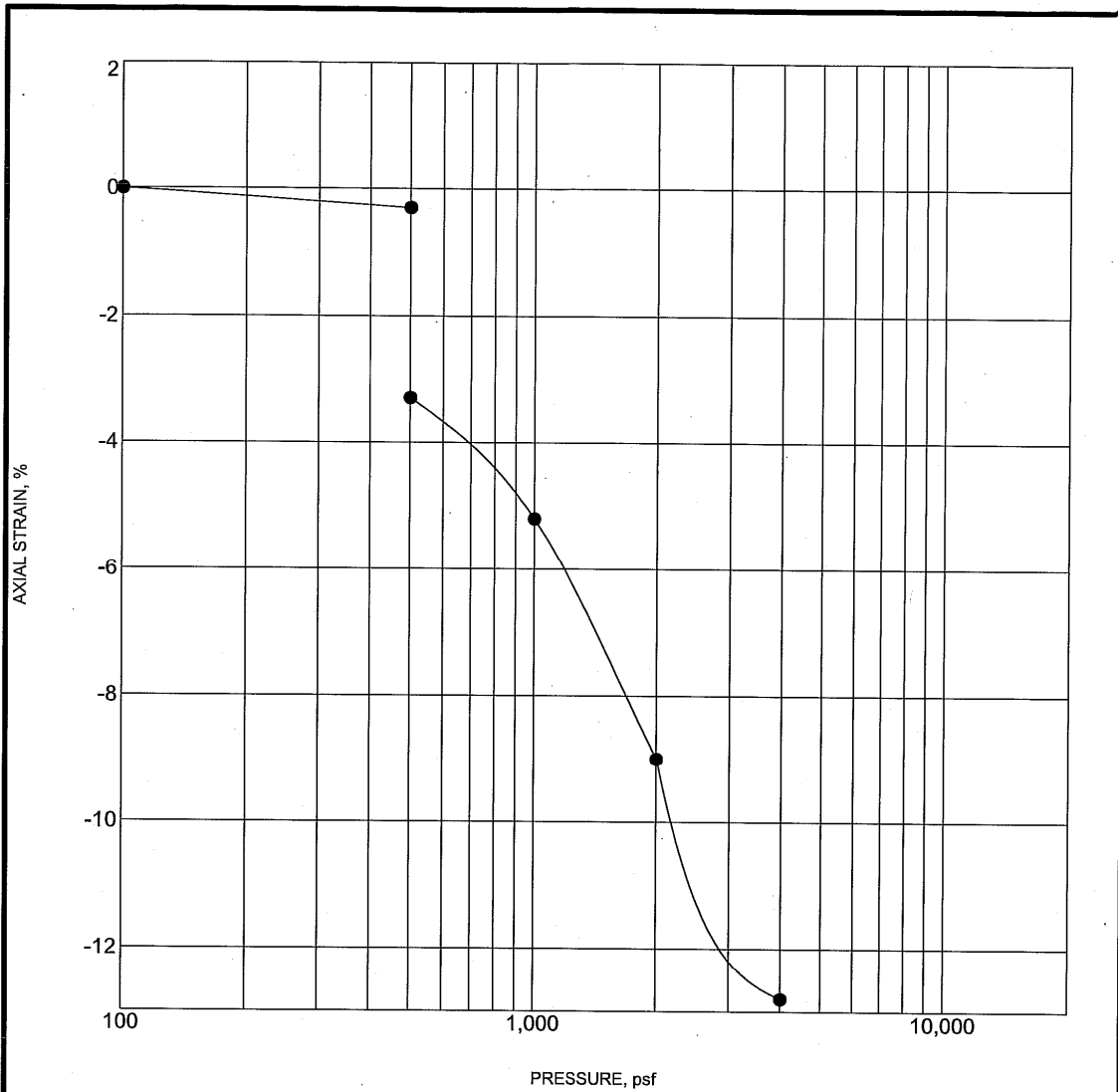
Notes:

TC CONSOL VOID RATIO 20075108.GPJ BORING.GDT 6/13/08



CONSOLIDATION TEST

Project: AREVA Idaho Falls Site-Laboratory Testing
 Site: AREVA Idaho Falls Site Idaho Falls, Idaho
 Job #: 20075108

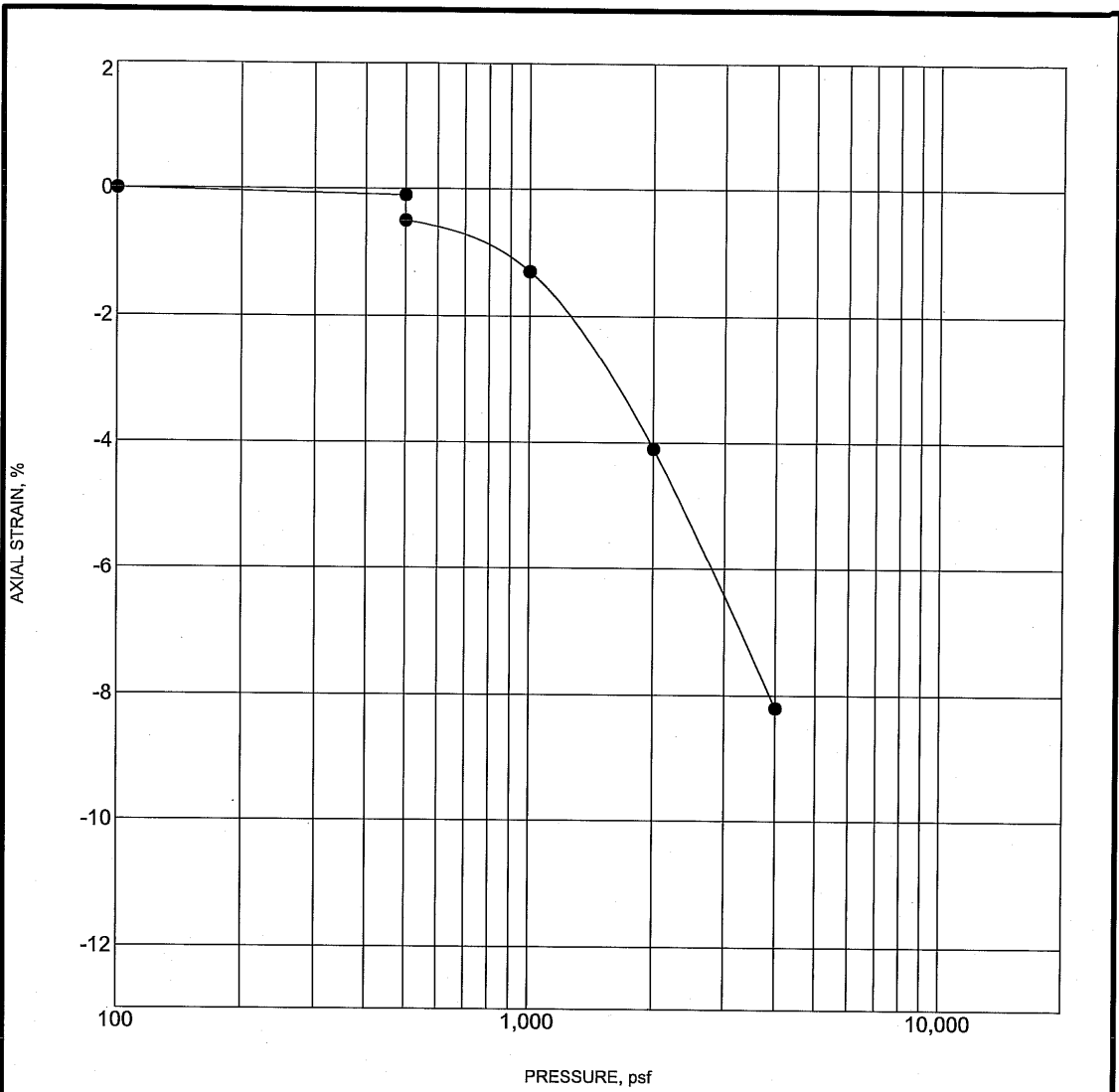


Specimen Identification		Classification	γ_d , pcf	WC, %
● 29	5.5ft	LEAN CLAY (CL)	81	13

Notes:

TC CONSOL STRAIN 20075108.GPJ BORING.GDT 6/13/08

	SWELL CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108 Date:

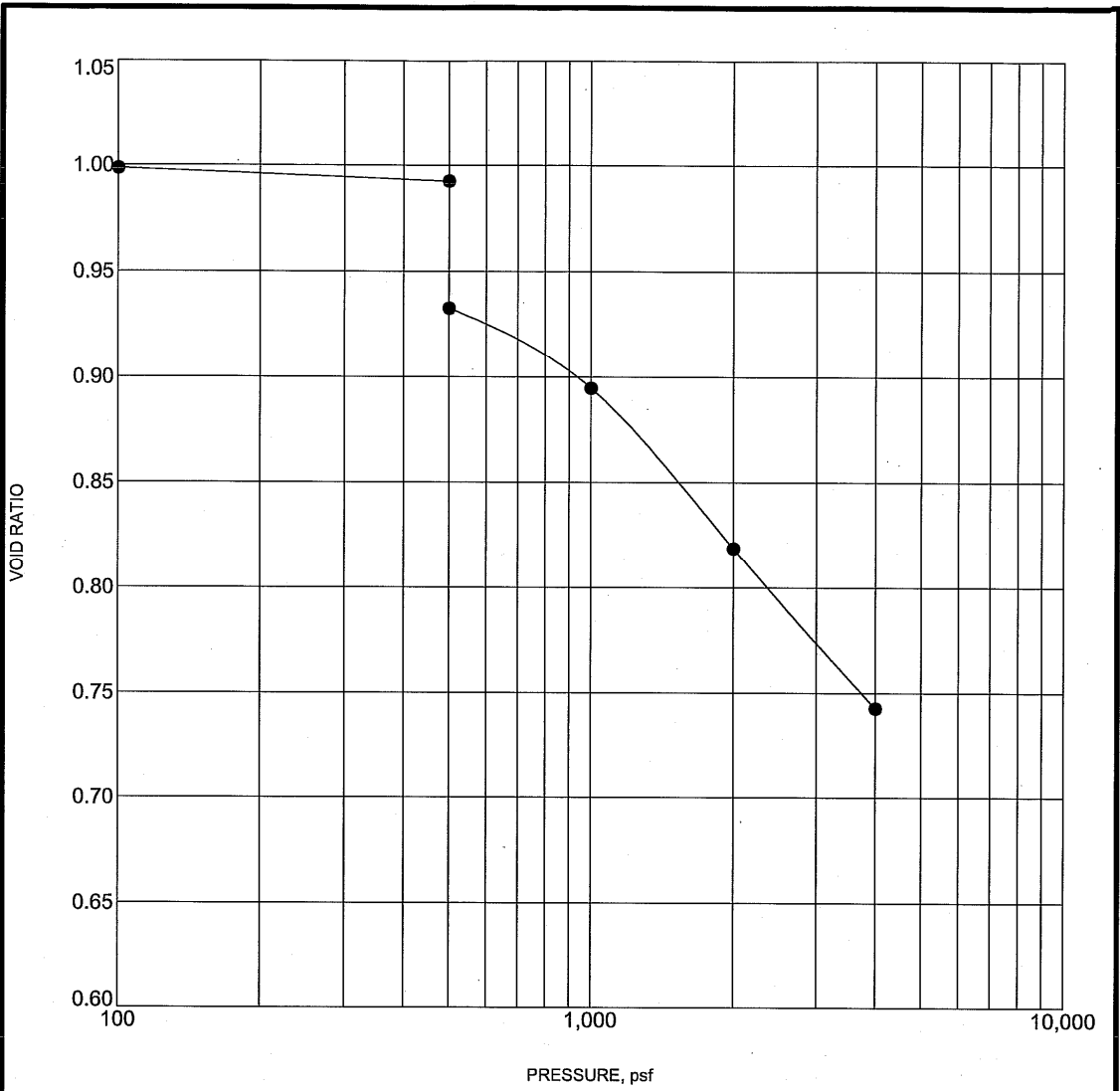


Specimen Identification	Classification	γ_d , pcf	WC, %
● 30 5.5ft	LEAN CLAY(CL)	90	11

Notes:

TC CONSOL. STRAIN 20075-08.GPJ BORING.GDT 6/13/08

	SWELL CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108 Date:

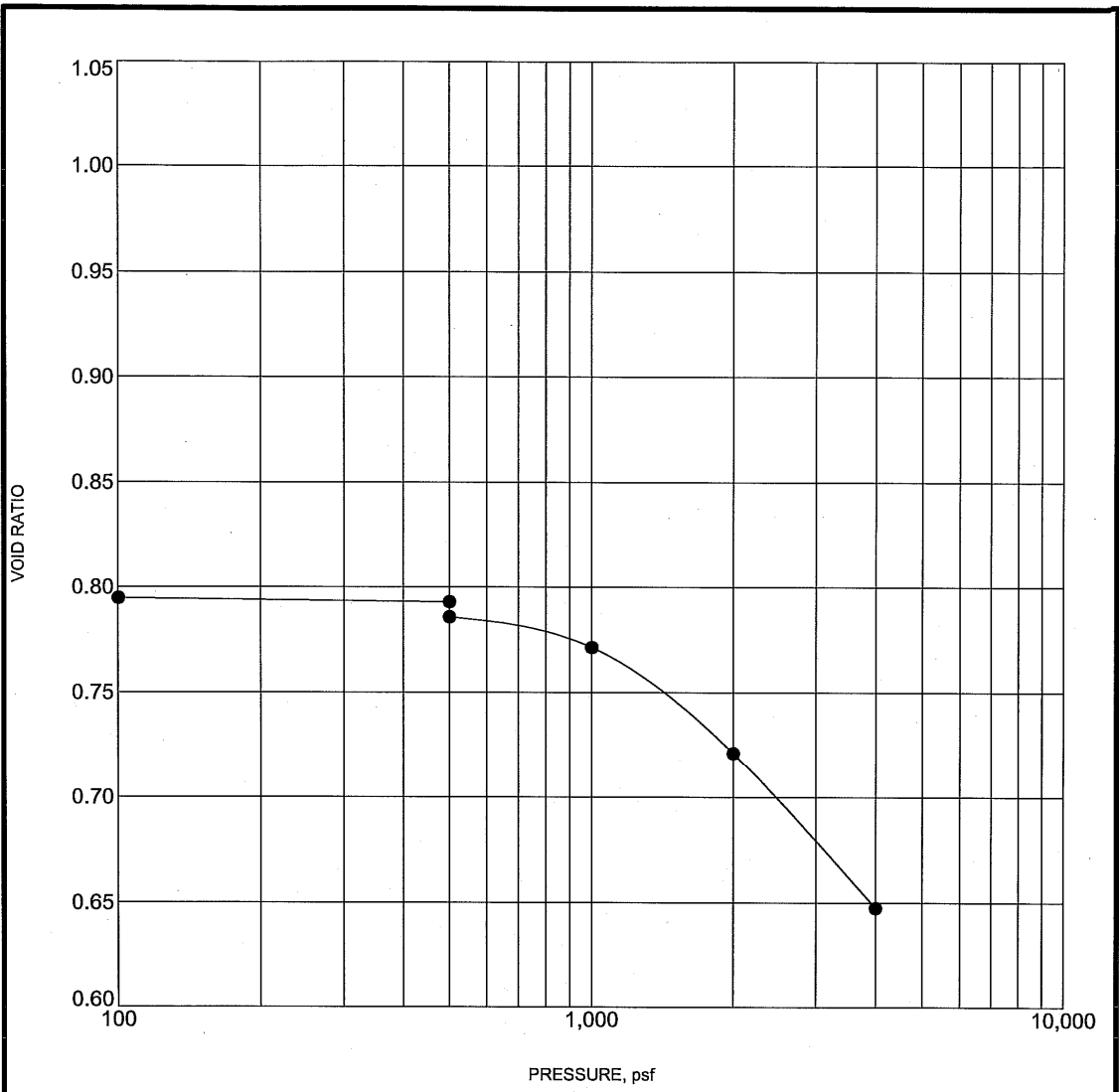


TG CONSOL. VOID. RATIO. 20075108.GPJ BORING.GDT 6/13/08

Specimen Identification	Classification	γ_d , pcf	WC, %
● 29 5.5ft	LEAN CLAY (CL)	81	13

Notes:

	CONSOLIDATION TEST
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108



Specimen Identification	Classification	γ_d , pcf	WC, %
● 30 5.5ft	LEAN CLAY(CL)	90	11

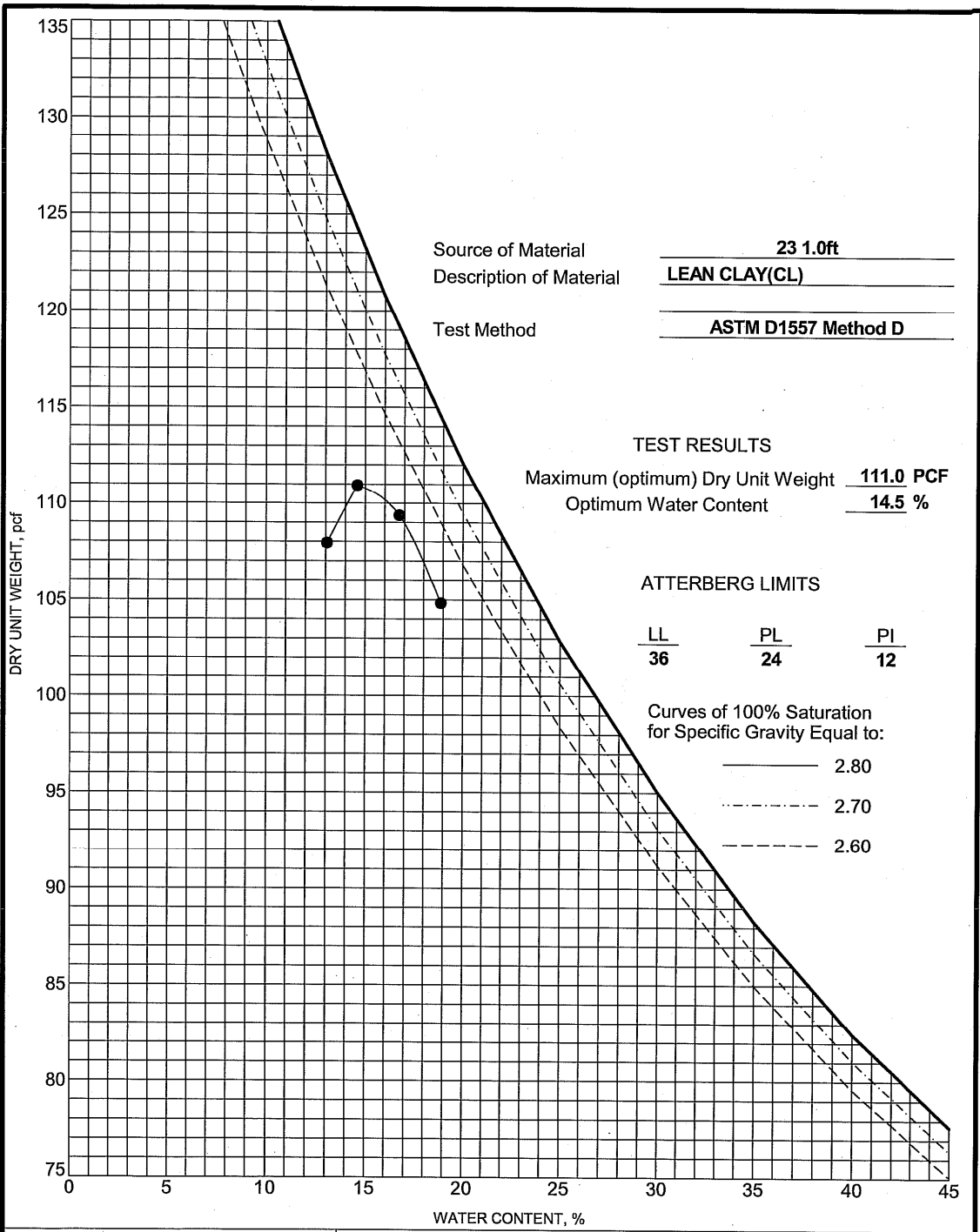
Notes:

TC CONSOL VOID RATIO 20075108.GPJ BORING.GDT 6/13/08



CONSOLIDATION TEST

Project: AREVA Idaho Falls Site-Laboratory Testing
 Site: AREVA Idaho Falls Site Idaho Falls, Idaho
 Job #: 20075108

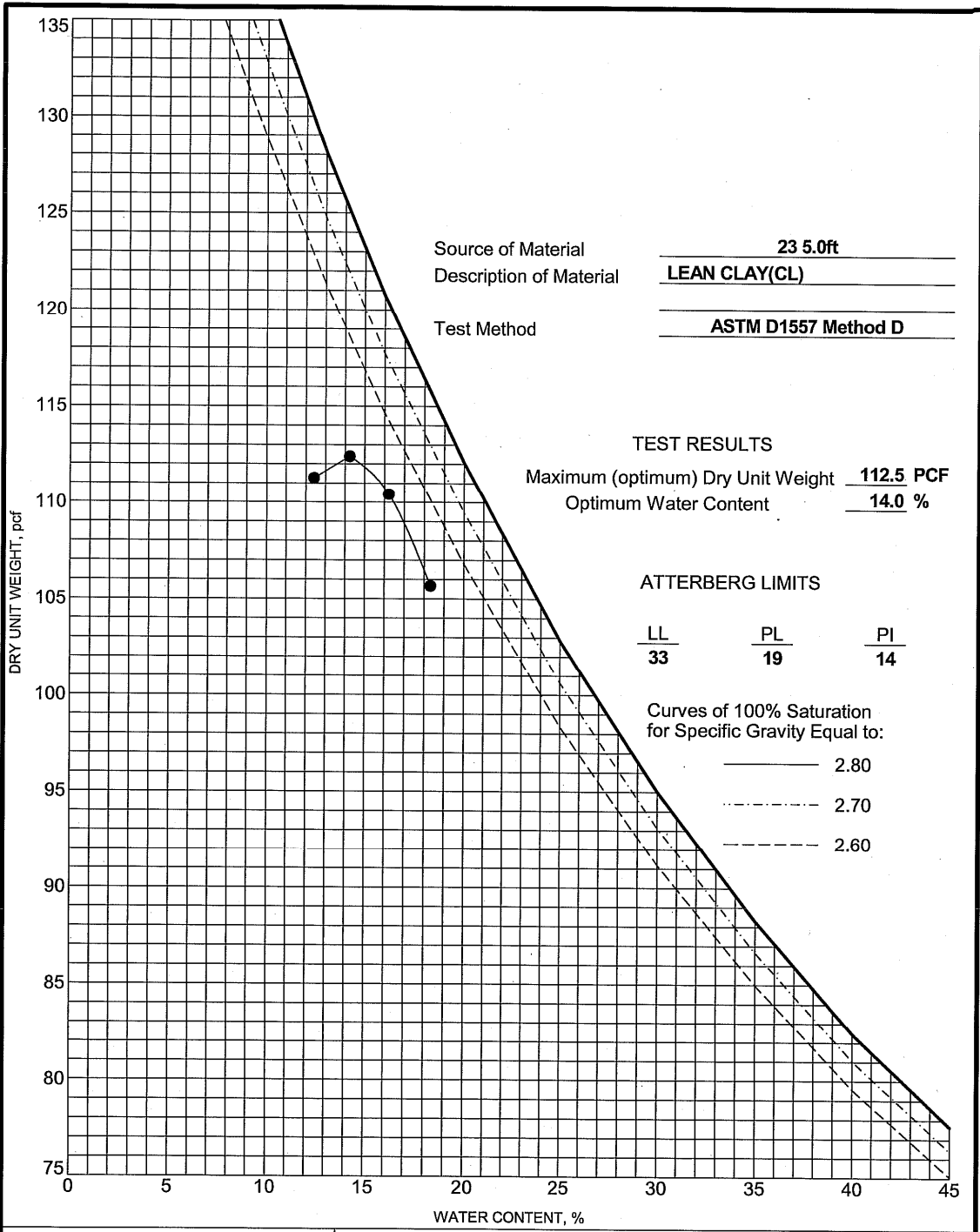


T.C. COMPACTION, 20075108.GPJ, BORING.GDT, 6/13/08



MOISTURE-DENSITY RELATIONSHIP

Project: AREVA Idaho Falls Site-Laboratory Testing
 Site: AREVA Idaho Falls Site Idaho Falls, Idaho
 Job #: 20075108
 Date:



TC COMPACTON 20075108.GPJ BORING.GDT 6/13/08

	MOISTURE-DENSITY RELATIONSHIP
	Project: AREVA Idaho Falls Site-Laboratory Testing Site: AREVA Idaho Falls Site Idaho Falls, Idaho Job #: 20075108 Date:



301 North Howes Street
FORT COLLINS, COLORADO 80521
(970) 484-0359 FAX (970) 484-0454

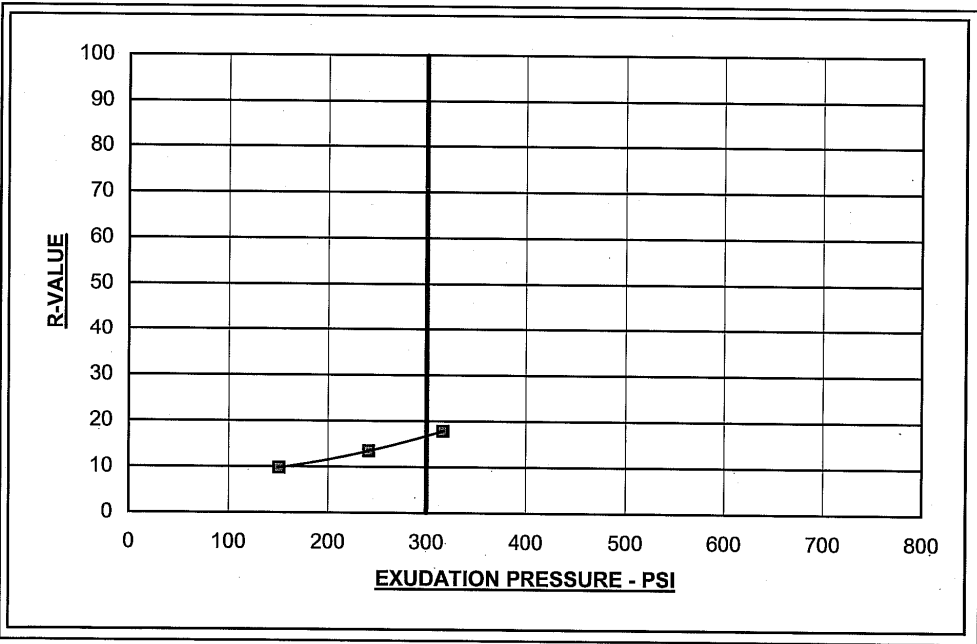
RESISTANCE R-VALUE & EXPANSION PRESSURE OF COMPACTED SOIL ASTM D2844

CLIENT: MWH
PROJECT: AREVA Idaho Falls Project
LOCATION: BH23 @ 1'
TERRACON NO. 20075108
DATE OF TEST: 29-May-08
CLASSIFICATION: lean clay (CL)

SAMPLE DATA TEST RESULTS

TEST SPECIMEN NO.	1	2	3
COMPACTION PRESSURE (PSI)	80	145	230
DENSITY (PCF)	104.9	109.5	110.7
MOISTURE CONTENT (%)	21.6	19.0	18.2
EXPANSION PRESSURE (PSI)	-0.31	-0.12	-0.16
HORIZONTAL PRESSURE @ 160 PSI	136	130	127
SAMPLE HEIGHT (INCHES)	2.64	2.56	2.56
EXUDATION PRESSURE (PSI)	150.4	241.8	316.6
CORRECTED R-VALUE	9.8	13.5	17.8
UNCORRECTED R-VALUE	9.2	13.2	17.4

R-VALUE @ 300 PSI EXUDATION PRESSURE = 17





301 North Howes Street
FORT COLLINS, COLORADO 80521
(970) 484-0359 FAX (970) 484-0454

RESISTANCE R-VALUE & EXPANSION PRESSURE OF COMPACTED SOIL AASHTO T-190

CLIENT: MWH
PROJECT: AREVA Idaho Falls Project
LOCATION: BH23 @ 5'
TERRACON NO. 20075108
DATE OF TEST: 29-May-08
CLASSIFICATION: lean clay (CL)

SAMPLE DATA TEST RESULTS

TEST SPECIMEN NO.	1	2	3
COMPACTION PRESSURE (PSI)	85	170	220
DENSITY (PCF)	105.4	110.3	111.8
MOISTURE CONTENT (%)	21.0	18.6	18.2
EXPANSION PRESSURE (PSI)	-0.31	-0.31	-0.31
HORIZONTAL PRESSURE @ 160 PSI	139	129	123
SAMPLE HEIGHT (INCHES)	2.61	2.54	2.52
EXUDATION PRESSURE (PSI)	200.5	286.4	326.2
CORRECTED R-VALUE	8.8	14.6	19.0
UNCORRECTED R-VALUE	8.5	14.6	19.0

R-VALUE @ 300 PSI EXUDATION PRESSURE = 16

