APPENDIX E

Geotechnical Investigation Summary Report

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
2.0	GEOLOGIC SETTING	1
3.0	SITE GEOTECHNICAL INVESTIGATIONS	1
4.0	SUBSURFACE CONDITIONS	2
4.1	SOIL CONDITIONS	2
4.2	BEDROCK CONDITIONS	3
4.3	GROUNDWATER	3
5.0	PRELIMINARY FOUNDATION RECOMMENDATIONS	3
5.1	FOUNDATIONS ON ROCK	3
5.2	FOUNDATIONS ON SOIL	3
5.3	CORROSION PROTECTION	4
5.4	SEISMIC SITE CLASS	4
5.5	LIQUEFACTION	4
6.0	RECOMMENDATIONS FOR ADDITIONAL WORK	4
7.0	BORING LOGS	12
7.1	NOVEMBER 2007 – SOIL	12
7.2	MAY 2008 – SOIL	32
7.3	APRIL – MAY 2008 – ROCK CORING	42
8.0	LABORATORY RESULTS	109
8.1	NOVEMBER 2007 RESULTS	109
8.2	MAY 2008 RESULTS	116

LIST OF TABLES

Table E.1 Summary of Laboratory Soil Index Testing
Table E.2 Summary of Chemical Testing

LIST OF FIGURES

Figure E.1 Boring Location Plan

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 SW¼ of section 13, the SE¼ of section 14, the NE¼ of section 23, and the NW¼ 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 6.6 m (0.5 to 21.5 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 6.6 m (21.5 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, grayish 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, Cc, 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/cm^3 (111 and 112.5 lbs/ft^3) 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 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/cm³ [pcf])	Gradation Gravel (%)	Sand (%)	Fines (%)	Silt (%)	Clay (%)	Atterberg Limits LL (%)	PI (%)	Soil Type
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	1.5 [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	1.5 [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	6.6 [21.5]		19.0									CL

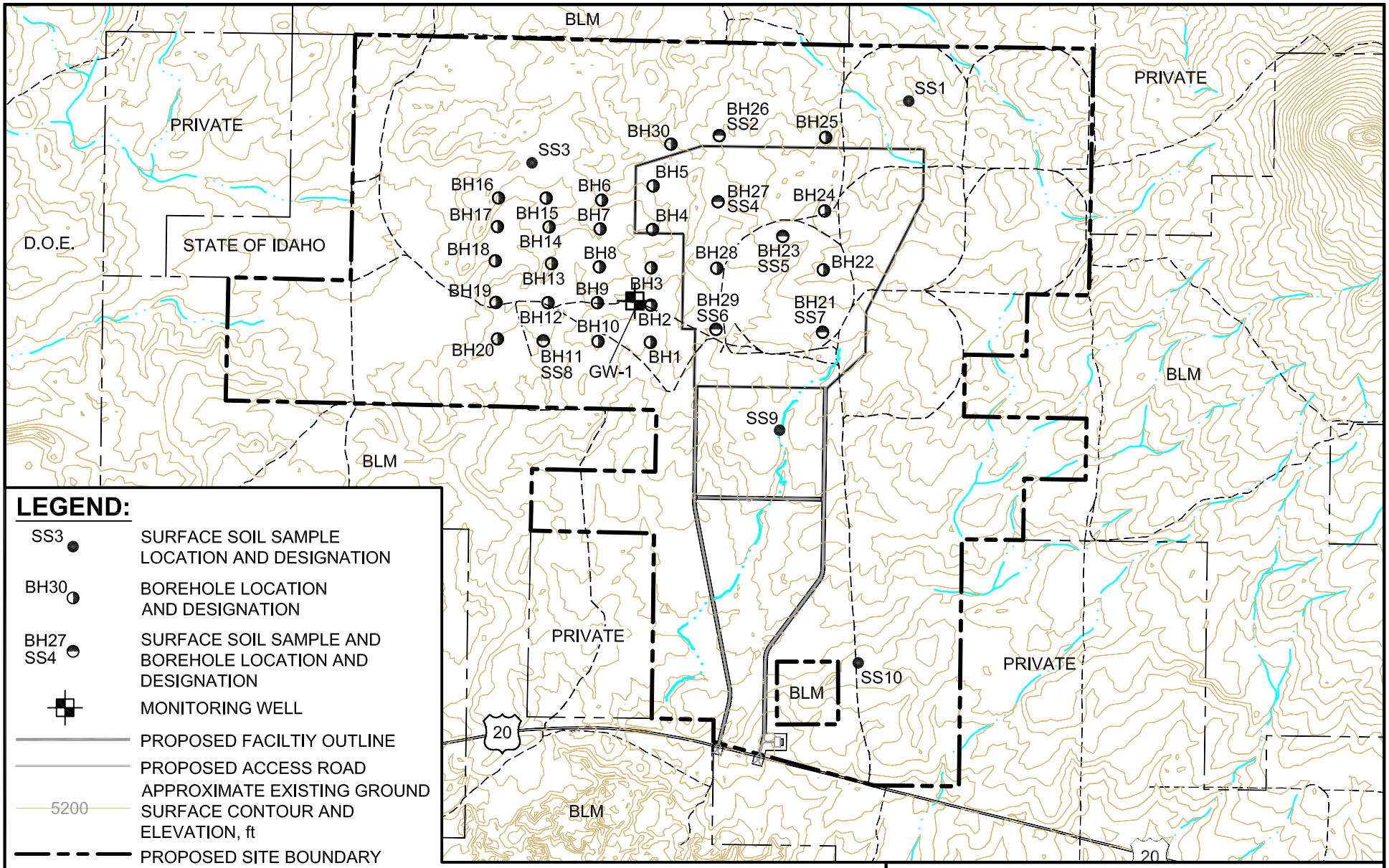
Specific Gravity	ASTM D854-06
Natural Moisture Content	ASTM D2216-98
Natural Dry Density	ASTM D2216-98
Grain Size Analysis	ASTM D422-63R02
Atterberg Limits	ASTM D4318-00

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 SS4	SURFACE SOIL SAMPLE AND BOREHOLE LOCATION AND DESIGNATION
	MONITORING WELL
	PROPOSED FACILTIY 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.

SCALE
0 800 1600 m

SCALE
0 2500 5000 ft

N

Figure E-1 **Rev. 0**

Borehole and Soil Sample Locations

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

7.0 BORING LOGS

7.1 NOVEMBER 2007 – SOIL

BH1 through BH20

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	BH1
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
			5'				
			Tan to lt. brown clay, dry	CL	10	7	Observations from cuttings.
			6'	CL			
			Tan to lt. brown clay, dry				
10	5153.35		10'	CL	12	41	
			Brown clay with black basalt fragments, moist				
			11'6"	ROCK			
			Refusal				
20	5143.35						
30	5133.35						
40	5123.35						
50	5113.35						
60	5103.35						
70	5093.35						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH2**
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): 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
			5'				
			Tan to lt. brown clay, slightly moist	CL	4	16	2" Layer of flaky, very light tan clay, dry Observations from cuttings
			6'	CL			
			Tan to lt. brown clay, dry				
10	5164.71		10'	CL	4	51/5"	
			Brown clay with black basalt fragments, moist	ROCK			
			10'6"				
			Refusal				
20	5154.71						
30	5144.71						
40	5134.71						
50	5124.71						
60	5114.71						
70	5104.71						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH3**
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 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
			5'				
			Lt. brown clay, slightly moist	CL	3	9	Observations from cuttings
			6'	CL			
			Tan to lt. brown clay, dry				
10	5173.79		10'	CL	14	25	
			Brown clay with black basalt fragments, dry	ROCK			
			11'				
			Refusal				
20	5163.79						
30	5153.79						
40	5143.79						
50	5133.79						
60	5123.79						
70	5113.79						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH4**
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): 12 ft	Depth to Water (ft):	Northing: 699788.587	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared & John	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
			5'				
			Brown, moist clay	CL	6	12	Observations from cuttings
			6'	CL			
			Tan to lt. brown clay, dry				
10	5165.05		10'	CL	8	53	
			Brown, moist clay				
			12'	ROCK			
			Refusal				
20	5155.05						
30	5145.05						
40	5135.05						
50	5125.05						
60	5115.05						
70	5105.05						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH5**
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
			5'				
			Tan clay, dry	CL	DM	25	
			8'	ROCK			
			Refusal				
10	5177.12						
20	5167.12						
30	5157.12						
40	5147.12						
50	5137.12						
60	5127.12						
70	5117.12						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH6**
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
			5' Brown clay, slightly moist	CL	8	29	some organic material, grasses
			8' Refusal	ROCK			
10	5167.77						
20	5157.77						
30	5147.77						
40	5137.77						
50	5127.77						
60	5117.77						
70	5107.77						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH7**
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
			5'				
			Brown clay, moist	CL	6	31	
			7'	ROCK			
			Refusal				
10	5153.93						
20	5143.93						
30	5133.93						
40	5123.93						
50	5113.93						
60	5103.93						
70	5093.93						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH8**
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): 0.5 ft	Depth to Water (ft):	Northing: 698972.681	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared & John	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
			6" Refusal	ROCK			
10	5157.09						
20	5147.09						
30	5137.09						
40	5127.09						
50	5117.09						
60	5107.09						
70	5097.09						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH9**
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: 698205.143	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared & John	Easting: 583403.290	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			Tan clay, dry	CL			Observations from cuttings
			5'				
			Brown clay, moist	CL	4	6	
			8'	ROCK			
			Refusal				
10	5167.5						
20	5157.5						
30	5147.5						
40	5137.5						
50	5127.5						
60	5117.5						
70	5107.5						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH10**
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
			5'	CL	DM	21	
			Tan clay, dry	CL			Observations from cuttings
			6'				
			Tan to lt. brown clay, dry				
10	5160.42		10'	CL	12	28	
			Lt. brown clay, moist				
			14'	ROCK			
			Refusal				
20	5150.42						
30	5140.42						
40	5130.42						
50	5120.42						
60	5110.42						
70	5100.42						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH11**
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
			2'6"				
			Refusal	ROCK			
10	5143.86						
20	5133.86						
30	5123.86						
40	5113.86						
50	5103.86						
60	5093.86						
70	5083.86						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH12**
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
			5'				
			Lt. tan clay, dry	CL	4	15	Observations from cuttings
			6'	CL			
			Tan to lt. brown clay, dry				
10	5154.68		10'				
			Lt. brown clay, dry	CL	DM	42	
			14'	ROCK			
			Refusal				
20	5144.68						
30	5134.68						
40	5124.68						
50	5114.68						
60	5104.68						
70	5094.68						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH13**
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
			5'				
			Tan clay, slightly moist	CL	6	20	some organics
			7'	ROCK			
			Refusal				
10	5161.78						
20	5151.78						
30	5141.78						
40	5131.78						
50	5121.78						
60	5111.78						
70	5101.78						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH14**
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
			5'				
			Brown clay, moist	CL	6	16	
			7'6"				
			Refusal	ROCK			
10	5150.75						
20	5140.75						
30	5130.75						
40	5120.75						
50	5110.75						
60	5100.75						
70	5090.75						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH15**
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: 700429.172	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared & John	Easting: 582276.876	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
			3'6" 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

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH16**
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
			3'6" Refusal	ROCK			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

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH17**
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): 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	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. tan clay, dry	CL			Observations from cuttings
			4' Refusal	ROCK			
10	5132.74						
20	5122.74						
30	5112.74						
40	5102.74						
50	5092.74						
60	5082.74						
70	5072.74						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH18**
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
			5'	ROCK	DM	50/3"	
			Tan clay with basalt fragments, dry	ROCK			
			5'6"				
			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

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH19**
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 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
			3'				
			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

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH20**
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: 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
			5'	ROCK	4	7	
			Lt. brown clay, dry	ROCK			
			6'				
			Refusal				
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

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	BH21
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): 2 ft	Depth to Water (ft):	Northing: 697639.321	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared	Easting: 588232.531	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	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
			2'				
			Refusal	ROCK			
10	5169.63						
20	5159.63						
30	5149.63						
40	5139.63						
50	5129.63						
60	5119.63						
70	5109.63						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH22**
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): 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
			5'	CL	8"	1	Sample taken from inside the center pivot area
			Soils very soft, split spoon sunk 12" on the first blow. Soil is brown silty clay, moist.	CL			
			6'				
10	5194.89		Brown silty clay, moist				
			10'	ROCK			
20	5184.89						
30	5174.89						
40	5164.89						
50	5154.89						
60	5144.89						
70	5134.89						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH23**
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 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
			5'	ROCK			Samples from the NW side of center pivot
10	5184.98						
20	5174.98						
30	5164.98						
40	5154.98						
50	5144.98						
60	5134.98						
70	5124.98						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH24**
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): 2.5 ft	Depth to Water (ft):	Northing: 700238.043	Vertical Angle:
Drilling Contr.: Andrew Well Drilling	Driller: Jared	Easting: 588240.236	Ground Elev.: 5209.66

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			Brown silty clay, moist.	CL			Basalt outcroppings to the north @5'
			2'6"				
			Refusal	ROCK			Observations from cuttings
10	5199.66						
20	5189.66						
30	5179.66						
40	5169.66						
50	5159.66						
60	5149.66						
70	5139.66						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH25**
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
			5'				
			Soil is brown silty clay, moist.	CL	12"	4	Observations from splitspoon
			6'6"	CL			Observations from cuttings
			Brown silty clay, moist.	ROCK			
			7'				
10	5190.64		Refusal				
20	5180.64						
30	5170.64						
40	5160.64						
50	5150.64						
60	5140.64						
70	5130.64						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH26**
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
			5'				
			Brown clumpy silty clay, moist.	CL			
			5'6"	ROCK			
			Refusal				
10	5181.4						
20	5171.4						
30	5161.4						
40	5151.4						
50	5141.4						
60	5131.4						
70	5121.4						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH27**
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
			5'				
			tan silty clay, powdery dry. No sample recovered.	CL			
			5'6"	ROCK			
			Refusal				
10	5177.94						
20	5167.94						
30	5157.94						
40	5147.94						
50	5137.94						
60	5127.94						
70	5117.94						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH28**
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): 4 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
			5'				
			tan silty clay, powdery dry.	CL		19	
			6'	ROCK			
			Refusal				
10	5165.61						
20	5155.61						
30	5145.61						
40	5135.61						
50	5125.61						
60	5115.61						
70	5105.61						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH29**
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): 11 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.
			5'				
			Soil is tan silty clay, moist. Not much cohesion.	CL	6"	33	Observations from sample.
			6'	CL			Observations from cuttings.
			Brown silty clay, moist.				
10	5159.69		10'				
			Brown silty clay, moist, more cohesive.	CL	12"	21	Observations from sample.
			11'	ROCK			
			Refusal				
20	5149.69						
30	5139.69						
40	5129.69						
50	5119.69						
60	5109.69						
70	5099.69						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH30**
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): 21.5 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
			5'				
			Soil is brown clumpy silty clay, moist.	CL	6"	43	Observations from sample
			6'	CL			Observations from cuttings
			Brown silty clay, moist.				
10	5180.33		10'				
			Brown silty clay, moist.	CL	6"	11	Observations from sample
			11'	CL			Observations from cuttings
			Brown silty clay, moist				
			15'				
			Brown silty clay, moist	CL	8"	14	Observations from sample
			16'	CL			Observations from cuttings
			Brown silty clay, moist				
20	5170.33		20'				
			Brown silty clay, moist	CL	12	18	Observations from sample
			21'6"	ROCK			
			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

MWH

Project: Areva
Feature: Core 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
			2.5/3.5 (83%)	NA							
1											
2											
3											
									SLIGHT WEATHERING VESICULAR OLIVINE BASALT, WK FEOX IN SOME VESICLES, HARD VERY STRONG ROCK		BEDROCK / SOIL INTERFACE
4			1.5/1.5 (100%)	1.2/1.5 (80%)							
								1 mm			
5		1							BROWNISH BLACK (5Y 2/1) TO BLACK (N1) GRADING TO FRESH APPROX 5' BGS VESICLES UP TO 15 mm		
			3.2/3.5 (90%)	3.2/3.5 (90%)							
								1 mm			
6									LOST WATER CIRCULATION FLUID OUT IN FRACTURES		
7											
8											
								1 mm			
		2							GRADING TO SMALLER VESICLES WITH FEW UP TO 10 mm		
9			2.0/2.0 (100%)	1.7/2.0 (85%)				1 mm			
							70°	1-2 mm			
10											BOX 2
		3									

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ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	2 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.)
11			5.0/5.0 (100%)	3.6/5.0 (72%)					VESICULAR OLIVINE BASALT, WK FEOX LOCALLY BROWNISH BLACK (5Y 2/1) ABUNDANT VESICLES UP TO 10 mm		
12							70°	1 mm 1 mm			
13											
14							80°	13 mm GAP			
15		4	4.9/5.0 (98%)	4.5/5.0 (90%)							
16								1 mm 1 mm			
17									GRADES TO DARK REDDISH GRAY (10 YR 3/1)		
18							10-0°	1-2 mm			
19							20° 80°				BOX 3
20		5	5.2/5.0 (100%)	5.2/5.0 (100%)				2-6 mm			
21											

1005746D08-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core 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 (%)	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.)
22							50°		VESICULAR OLIVINE BASALT, DARK GRAY (N4)		
23											
							30°	1-2 mm			
24											
25							10°		1 mm WITH 5 mm VOID		
26		6	5.0/5.0 (100%)	5.0/5.0 (100%)							
27										TEST P-8 K_h = 3.0 E-5	
28											BOX 4
29									LARGE VESICLES UP TO 20 mm		
							30°				
30		7						3 mm			
31			5.0/5.0 (100%)	3.2/5.0 (64%)					SMALL VESICLES		
							80°	1 mm			
32									CLAY ALONG FRACTURE, LARGE VESICLES UP TO 15 mm, GENERALLY <2 mm		

1005746D008-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	4 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.)
33									SMALL VESICLES, GENERALLY 1-2 mm		
34											
								3 mm			
35							40°				
		8									
36			5.0/5.0 (100%)	5.0/5.0 (100%)							
37											
							90°	1-3 mm			
38											BOX 5
39											
40											
		9						UP TO 10 mm	40.5-41.4 VERY FINE SMALL VESICLES (<1 mm)		
			5.0/5.0 (100%)	3.3/5.0 (66%)							
41											
								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)		
42											
							40°		GRADES TO VERY DARK GRAY (N3)		
43									GRADES TO WEAK RED (10R 4/2)		
									CINDERS DUSKY RED (10R 3/3)		

1005746D008-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	5 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.)
44											
45											
		10							LARGE VESICLES 4-20 mm		
46			5.0/5.0 (100%)	5.0/5.0 (100%)							
									GRADES TO DUSKY RED (10R 3/2)		
47							60°	5 mm			BOX 6
48											
49											
50											
		11									
51			5.1/5.0 (100%)	4.7/5.0 (94%)			10°	2 mm			
									51.5-53.5 VERY FINE GRAINED BASALT, FEW 1mm VESICLES		
52							60°	2 mm			
53											
									3-5 mm VESICLES		
54							90°	2 mm			

1005746D08-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	6 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.)
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)		
57											BOX 7
58									GRADES TO LARGER VESICLES (3-15 mm) AND DARK REDDISH GRAY (10R 3/1)		
59							85°		5-10 mm OR MORE		
60									FRACTURE FILLED WITH SILTY FINE TO MEDIUM SAND, LOST APPROXIMATELY 0.5' OF MATERIAL WITH CIRCULATION		
		13							VESICULAR BASALT, DUSKY RED (2.5YR 3/2)		
61			5.0/5.0 (100%)	4.6/5.0 (92%)			90°		SILTY CLAY, YELLOWISH BROWN (10YR 5/4) MEDIUM PLASTICITY VERY STIFF		
62							60°	1 mm	OLIVINE BASALT, DARK GRAY (N4) VESICLES 1-10 mm		
63							60°	1 mm			
									SILTY CLAY, AS ABOVE AT 61'		
64							20°				
									VESICULAR BASALT, DUSKY RED (2.5YR 3/2) VESICLES 2-10 mm		
65		14					10°				

1005746D008-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	7 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.)
66			4.7/5.0 (94%)	3.1/5.0 (62%)				1-5 mm	VERY FRACTURED OLIVINE BASALT, 1-5 mm FRACTURES, REDDISH GRAY (2.5YR N5)		
67							85°	2 mm			BOX 8
								2 mm			
68							80°	1-2 mm			
69								1 mm			
70									VESICLES 3-10 mm		
		15									
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											
73							80°	2 mm			
74									20 mm TOTAL WITH SILTY CLAY FRACTURE FILLING		
75							20°		WITH SILTY CLAY FRACTURE FILLING		
		16						3 mm	3 mm, FEOX ALONG FRACTURE WITH TRACE CLAY		
76											

1005746D09-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core 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											BOX 9
			5.0/5.0 (100%)	4.5/5.0 (90%)							
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										TEST P-7 K_h = 2.0 E-08	
84											
85											
		18	5.0/5.0 (100%)	5.0/5.0 (100%)							
86									OLIVINE BASALT, VERY DARK GRAY (N3) TO BLACK (N2.5) VERY FINE GRAINED, FEW VESICLES 2 mm		
87											BOX 10

1005746D08-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	9 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.)
88											
89											
								1-2 mm			
							30°				
90									BASALT, OLIVINE WITH 1-5 mm VESICLES VERY DARK GRAY (N3) TO BLACK (N2.5)		
		19									
			4.9/5.0 (98%)	3.4/5.0 (68%)							
91								2 mm			
							60°				
								1-2 mm			
92											
							60°				
									3-8 mm WITH TRACE SILTY CLAY FRACTURE FILLING		
93											
							70°				
								2 mm			
								1 mm			
94											
								1 mm			
							60°				
								1 mm			
95											
		20					60°				
							60°				
									VERY FRACTURED, ALL 1-3 mm		
			5.0/5.0 (100%)	3.2/5.0 (64%)							
96									VERY DARK GRAY (N3) WITH DARK REDDISH GRAY (10R 3/1) LOCALLY		BOX 11
							40°				
97											
							40°				
							60°				
98											

1005746D008-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 10 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.)
99							80°				
							60°				
100											
		21	4.9/5.0 (98%)	3.6/5.0 (72%)			50°		VERY FRACTURED WITH 1-3 mm FRACTURES		
101								5 mm			
							50°		GRADES TO VERY DARK GRAY (N3) WITH SOME DARK REDDISH GRAY (10R 3/1) MAINLY ALONG FRACTURES		
102											
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			

1005746D09-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 11 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.)
110		23	4.8/5.0 (96%)	2.4/5.0 (48%)			80°		VERY SMALL VESICLES (1-2 mm)		
111							50°				
112									OLIVINE BASALT, SMALL (<1 mm) VESICLES VERY DARK GRAY (N3)		
							50°				
113									VERY FRACTURED TO RUBBLE (113-115.5) SOME SILTY CLAY FRACTURE FILLING		
114											BOX 13
								20 mm			
115		24	5.0/5.0 (100%)	3.1/5.0 (62%)				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									3-5 mm VESICLES		
118							80°		BASALT, GRADES TO VERY DARK GRAY (N3) TO DARK REDDISH GRAY (10R 3/1)		
									3-10 mm VESICLES		
119							80°				
120		25	4.9/5.0 (98%)	4.9/5.0 (98%)							

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core 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 (%)	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.)
121							80°	1 mm			
122									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		
								1-2 mm			
123											BOX 14
							50°				
124											
							80°	1 mm			
125		26					70°				
								1 mm			
			5.0/5.0 (100%)	4.8/5.0 (96%)							
126									FINE GRAINED OLIVINE BASALT, VESICLES <1 mm GRADES TO REDDISH BLACK (2.5YR N2.5) TO GRAY (N5)		
127											
							70°	1 mm			
128											
129											
130									INCREASE IN VESICLE SIZE TO 2-10 mm, SOME CINDERS OF WEAK RED (10R 4/4) AT 130.5		
		27									
131			5.0/5.0 (100%)	3.8/5.0 (76%)							
							80°	7 mm	BASALT, GRADES TO WEAK RED (10R 4/3)		

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 13 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.)
132							70°	2 mm			
133									FRACTURED TO RUBBLE BASALT, WEAK RED (10R 4/3) VESICLES 2-10 mm		BOX 15
							70°	1 mm			
								2 mm			
134							40°				
							50°	2 mm			
135							80°	2 mm			
		28									
136			5.0/5.0 (100%)	3.8/5.0 (76%)							
							80°	3 mm			
137											
							80°				
138								20 mm VOID			
							70°				
							30°				
139											
140									RUBBLE 140-142.5		
		29									
141			5.0/5.0 (100%)	2.8/5.0 (56%)							
142											

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 14 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.)
143											BOX 16
								1 mm			
144									1-2 mm WITH TRACE SILT ALONG FRACTURES		
145							70°	1 mm			
		30									
146			4.2/5.0 (84%)	3.4/5.0 (68%)					RUBBLE / MAY HAVE BEEN VOID AT 145.5-146		
147							70° 80°	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											
149											
150							80°	2 mm			
		31					80°	2 mm			
			5.0/5.0 (100%)	4.7/5.0 (94%)							
151											
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

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 15 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.)
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)		
								3 mm	VESICLES AND VOIDS UP TO 15 mm		
160		33	4.8/5.0 (96%)	4.1/5.0 (82%)							
161											
162							85°	5 mm			
							80°	3 mm			
163									LARGE VESICLES AND VOIDS UP TO 25 mm		BOX 18
164							90°				

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 16 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.)
165											
		34							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		
			5.0/5.0 (100%)	5.0/5.0 (100%)							
166											
167											
168											
							80°	2-5 mm			
169											
170									FINE GRAINED BASALT, VESICLES 1-3 mm FEW TO 10 mm DARK GRAY (N4) TO DARK REDDISH GRAY (10R 3/1)		
		35									
			5.0/5.0 (100%)	5.0/5.0 (100%)							
171											
								3 mm			
172									VESICLES UP TO 20 mm 172-173 FEET		
173											BOX 19
174											
175											
		36									
			5.0/5.0 (100%)	4.1/5.0 (82%)							

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	17 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.)
176							40°		DARK GRAY (N4) WITH SOME WEAK RED (10R 4/3) ALONG FRACTURES		
177							80°				
178							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		
179							50°				
180		37	5.0/5.0 (100%)	3.1/5.0 (62%)							
181									VERY BROKEN TO RUBBLE 180.5-183		
182											BOX 20
183							40°		MEDIUM GRAINED BASALT, WITH VESICLES UP TO 3 mm, VERY DARK GRAY (N3)		
184								2 mm			
185		38					10-20°				
186			5.0/5.0 (100%)	5.0/5.0 (100%)				2 mm			

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	18 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.)
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							ML		RUBBLE ABOVE CONTACT FINE SANDY SILT, RED (10R 5/8) SLIGHTLY MOIST, NON PLASTIC		
195		40	5.0/5.0 (100%)	5.0/5.0 (100%)			ML				
196										TEST P-6 K_h = 2.5 E-06	
197									GRADES TO YELLOWISH BROWN (10YR 5/4) AT 197		
							ML		BASALT, DARK REDDISH GRAY (10R 4/1)		

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
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 (%)	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.)
198											
							ML		SILTY CLAY, VERY STIFF, SLIGHTLY PLASTIC, SOME BEDDING		
199											
									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		
200											
		41					80°	1 mm			BOX 22
			5.0/5.0 (100%)	4.7/5.0 (94%)			80°	3 mm			
201											
202											
203									VESICLES UP TO 10 mm GENERALLY 1-5 mm		
							90°	2 mm			
204											
205											
		42					90°	1-3 mm			
			4.4/5.0 (88%)	3.5/5.0 (70%)							
206											
									VOID, DRILLED VERY FAST FOR APPROX 0.5' TRACE SILT COATING		
207											
									BASALT GRADES TO GRAY (N5)		
208											
							90°	1 mm			

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	20 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.)
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°	1 mm			
213								5 mm			
214							30° 80°	2 mm	GRADES BASALT, TO DARK REDDISH GRAY (10R 4/1) AND TO LARGER VESICLES UP TO 10 mm		
215		44	5.0/5.0 (100%)	3.5/5.0 (70%)					FRACTURED TO RUBBLE WITH TRACE DUSKY RED (10R 3/7) CINDERS LARGE VESICLES UP TO 20 mm SOME OLIVINE ALONG FRACTURES		
216											
217									GRADES TO VERY FINE GRAINED BASALT, GRAY (N6)		
218											
219							80°				

1005746D009-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	21 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.)
220											BOX 24
		45							FINE GRAINED BASALT, AS ABOVE		
			4.3/5.0 (86%)	3.3/5.0 (66%)							
221											
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									

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 22 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.)
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%)							
237									GRADES TO FINE GRAINED BASALT, DARK GRAY (7.5R 4/1) WITH FEW VESICLES		
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

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 23 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.)
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		
							70°	1 mm			
								2 mm			
245		50									
			4.9/5.0 (98%)	4.6/5.0 (92%)			70°				
								2 mm			
246											
247								3 mm	WITH TRACE SILTY SAND		
							60°				
248								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											
		51					60°				BOX 27
								1 mm			
			5.0/5.0 (100%)	4.0/5.0 (80%)			70°				
251								1 mm			
252											

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	24 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.)
253							SM		SILTY SAND (SM), MODERATE YELLOWISH BROWN (10YR 5/4) NON PLASTIC		
							10°				
254								2 mm	VESICULAR BASALT, BLACK (N2.5), ABUNDANT VESICLES UP TO 10 mm		
255								2 mm	WITH TRACE SILTY SAND ALONG FRACTURE		
		52									
256			5.0/5.0 (100%)	5.0/5.0 (100%)							
257								2 mm			
									VESICULAR BASALT, AS ABOVE GRADING TO DARK GRAY (7.5R 4/1)		
258											
259											
260											
		53					80°				
			5.0/5.0 (100%)	4.7/5.0 (94%)				1 mm			BOX 28
261											
									DECREASE IN AMOUNT OF VESICLES UP TO 10 mm		
262											
263									FEW VUGS/VESICLES UP TO 20 mm		

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	25 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.)
264											
265							45°				
		54									
			5.0/5.0 (100%)	5.0/5.0 (100%)							
266											
									VESICULAR BASALT, BLACK (N2.5) TO DARK GRAY (N4) FEW VESICLES GREATER THAN 5 mm		
267											
268								2 mm			
269											
								2 mm	WITH TRACE YELLOWISH BROWN (10YR 5/4) SILT ALONG FRACTURE		
270							45°				BOX 29
		55									
			5.0/5.0 (100%)	5.0/5.0 (100%)							
271											
									NO FRACTURES, DARK REDDISH GRAY (10R 4/1), FINE GRAINED SMALL VESICLES 1-2 mm		
272											
273											
274											

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 26 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.)
275		56									
			5.0/5.0 (100%)	4.3/5.0 (86%)							
276							50°	1 mm			
277											
								1 mm	FINE GRAINED BASALT, WITH FEW VESICLES GREATER THAN 3 mm		
278											
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
			5.0/5.0 (100%)	5.0/5.0 (100%)							
281								2 mm	BASALT, GRADES TO DARK REDDISH GRAY (10R 3/1)		
							20°				
282								1 mm			
283							60°		GRADES TO BLACK (N2.5) BASALT, WITH ABUNDANT VESICLES 3-5 mm SOME 10-15 mm		
							20°	2-3 mm	FRACTURES FILLED WITH MODERATE YELLOWISH BROWN (10YR 5/4) SILT		
284											
							80°				
285		58									

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core 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 (%)	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.)
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			
							10°				
288								5-10 mm			BOX 31
							40°		SOME SILT OF YELLOWISH BROWN (10YR 5/4) IN FRACTURES AND RUBBLE		
289							40°	1 mm	SOME DUSKY RED (10R 3/4) IN VUGS VOIDS		
290		59					30°	3 mm	SOME SILT OF YELLOWISH BROWN (10YR 5/4)		
291			5.0/5.0 (100%)	3.7/5.0 (74%)				1 mm			
								1 mm			
292							50°				
293											
294											
295		60							LARGER VESICLES APPROX 295 DARK GRAY (N4) TO BLACK (N2.5) WITH DUSKY RED IN VOIDS RUBBLE		
296			5.0/5.0 (100%)	4.3/5.0 (86%)							

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	28 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.)
297											
								1 mm			
298											BOX 32
									SILT IN FRACTURE LARGE VESICLES DARK GRAY BLACK		
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 (2.5YR 4/2) IN VESICLES SAND DUSKY RED (10R 3/3) ALONG FRACTURES		
301											
302											
303							10°	2 mm			
304											
305									RUBBLE OF DARK GRAY (N4) TO BLACK (N2.5) VESICULAR BASALT, WITH WEAK RED (10R 3/3) ALONG FRACTURES AND IN VESICLES		
		62	5.0/5.0 (100%)	3.7/5.0 (74%)			70°				
306							85°	1 mm			
							85°	2 mm			
307											BOX 33

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 29 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.)
308									VERY FRACTURED BASALT, WITH WEAK RED (10R 4/4) CINDERS		
309											
									VERY FRACTURED, BASALT, GRADES TO DUSKY RED (10R 3/2) WITH YELLOWISH BROWN (10YR 5/4) SILTY COATING ALONG FRACTURES		
310											
		63									
311			5.0/5.0 (100%)	3.8/5.0 (76%)			70°	2-5 mm			
312									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		
							80°	2 mm			
313											
314								3 mm			
									VOID WITH LIGHT BROWN (7.5YR 6/3) COATING VESICLES UP TO 5 mm SOME VUGS		
315											
		64									
			2.0/2.5 (80%)	0.7/2.5 (28%)							
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		4/24/08

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	30 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.)
319											SHORT CORE RUN TO CHECK DRILL BIT BOX 34
								2 mm			
320		66							VESICULAR BASALT, VERY DARK GRAY (N3) WITH VESICLES UP TO 10 mm		
			4.2/4.6 (91%)	4.2/4.6 (91%)			60°	2 mm			
321											
322											
								5 mm	WITH TRACE YELLOWISH BROWN (10YR 5/4) SILT COATING ALONG FRACTURE		
323											
324											
		67									
325			1.0/1.0 (100%)	1.0/1.0 (100%)					DECREASE IN VESICLES SIZE AND FINER GRAINED BASALT, VERY DARK GRAY (N3)		SHORT CORE RUN TO CHECK DRILL BIT
		68									
326			5.0/5.0 (100%)	4.2/5.0 (84%)				1-2 mm			
327							85°	2 mm			
328											BOX 35
							30°				
329								1-4 mm	WITH SOME YELLOWISH BROWN (10YR 5/4) COATING ALONG FRACTURES AND TRACE SILT LOCALLY		
							10				

1005746D010-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	31 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.)
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		
								VOID			
334									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%)			60°	2 mm			
337							50°	1-2 mm			
338									GRADES TO VERY DARK GRAY (N3) WITH REDDISH GRAY (10R 3/1) LOCALLY WITH FEW VESICLES VESICLES UP TO 3 mm		BOX 36
339							80°	3 mm			
340		71									

1005746D11 – A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	32 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.)
341			5.0/5.0 (100%)	4.6/5.0 (92%)				3 mm			
								1 mm			
342							20°				
								2 mm	GRADES TO WEAK RED (10R 4/2) LARGE VESICLES UP TO 15 mm		
343							85°	1 mm			
344									GRADES TO DARK GRAY (N4) FINE TO MEDIUM GRAINED FEW VESICLES >2 mm		
							40°				
345											
		72	5.0/5.0 (100%)	4.7/5.0 (94%)					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		
346											
							90°	1-5 mm			
347											BOX 37
							90°	1-10 mm			
348											
							70°				
349								1 mm	SOME FRACTURE COATING OF YELLOW BROWN (10YR 5/4)		
								3 mm			
350											
		73	5.0/5.0 (100%)	5.0/5.0 (100%)							
351											

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	33 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.)
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 VESICULES UP TO 15 mm		
357							80°	2 mm			BOX 38
358								3 mm	GRADES TO DARK REDDISH GRAY (10R 3/1) WITH VESICULES UP TO 15 mm WITH SOME BENTONITE FROM DRILLING FLUID ALONG FRACTURES		
359								1 mm			
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		

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	34 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.)
363											
									GRADES TO WEAK RED (10R 4/2) WITH VESICLES UP TO 10 mm		
364							50°				
									2-5 mm TRACE YELLOWISH BROWN FRACTURE COATING, BASALT, GRADES TO DUSKY RED (10R 3/2)		
365		76					30°				
366			4.5/5.0 (90%)	2.8/5.0 (56%)			60°				
								2-5 mm	DARK RED (10R 3/4) FRACTURE COATING, TRACE SILTY SAND OF YELLOWISH BROWN (10YR 5/4) GRADES TO RUBBLE		BOX 39
367							40°				
368											
369							30°		BASALT, GRADES TO VERY DARK GRAY (N3) WITH VESICLES UP TO 5 mm		
370		77									
			4.9/5.0 (98%)	4.9/5.0 (98%)				1 mm			
371							10°				
									WITH TRACE YELLOWISH BROWN (10YR 5/4) COATING ALONG FRACTURE, BASALT, GRADES TO VERY DARK GRAY (N3) WITH VESICLES 5-20 mm		
372								2-3 mm			
373											

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 35 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.)
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										TEST P-5 Kh= 5.9E-04	BOX 40
378											
379							90°				
380		79	4.9/5.0 (98%)	4.6/5.0 (92%)				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		

1005746D011 – A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	36 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.)
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											BOX 41
							50°	1 mm	WITH TRACE SILTY COATING LOCALLY ALONG FRACTURES OF YELLOWISH BROWN (10YR 5/4)		
388							70°	1 mm			
389							50°	1 mm			
390		81	5.0/5.0 (100%)	4.3/5.0 (86%)			40°	1 mm			
391								1 mm			
392							50°	1 mm			
							40°	2 mm			
393							20°				
394									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		
395		82	4.5/5.0 (90%)	2.8/5.0 (56%)							BOX 42 4/25/08

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1
Sheet No.: 37 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.)
396											
397									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		
398											
							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							10°				
								2 mm	GRADES TO VESICULAR BASALT, WITH VESICLES UP TO 5-8 mm, VERY DARK GRAY (N3)		
402										TEST P-4 K_h= 3.6 E-06	
								ML/CL	SILT/CLAY, LOW TO MEDIUM PLASTICITY LOCALLY, STRONG BROWN (5YR 5/6) WITH COARSE GRAVEL TO COBBLE SIZE BASALT		
403											
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)		

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	38 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.)
407											
408											
409									GRADES TO CLAYEY SILT, SLIGHTLY MOIST		
410									WITH SOME FINE TO MEDIUM SAND		
		84									
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)		
							70°	1 mm			
412							80°	3 mm	FRACTURE COATING OF YELLOWISH BROWN (10YR 5/4)		
413								20 mm	VOID WITH SOME RUBBLE		
414											
415		85					20°	3 mm			BOX 44
			5.0/5.0 (100%)	5.0/5.0 (100%)							
416							60°	1 mm	FINE GRAINED BASALT, WITH FEW VUGS AND VESICLES UP TO 10 mm VERY DARK GRAY (N3)		
417							50°	2 mm			

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	39 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.)
418							40°	2 mm	WITH SOME PALE BROWN (10YR 6/3) COATING ALONG FRACTURE		
419							60°		VOID OF 20 mm		
420		86									
421			5.0/5.0 (100%)	3.7/5.0 (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		
							50°				
424							90°				
							50°				
425		86									BOX 45
			5.0/5.0 (100%)	4.5/5.0 (90%)							
426							60°	1-2 mm			
427							60°		RUBBLE IN FRACTURE (30 mm)		
428							85°	1-2 mm			

1005746D011 – A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	40 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.)
429							85°	2 mm			
430		88	4.5/5.0 (90%)	3.0/5.0 (60%)							
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							70°	1 mm			
435		89	5.0/5.0 (100%)	3.4/5.0 (68%)					WITH DUSKY RED (10R 4/4) CINDERS AT 435.5		BOX 46
436							40°				
							40°				
437							20°	3-5 mm	VESICLES BASALT, WITH PHENOCRYSTS VESICLES UP TO 5-8 mm, GENERALLY 1-5 mm, BLACK (N2.5)		
							20°				
438							90°				
							30°	1-2 mm			
439									TRACE DUSKY RED (10R 4/4) AND YELLOWISH BROWN (10YR 5/4) ALONG FRACTURES		

1005746D011—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	41 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.)
440		90	4.9/5.0 (98%)	4.6/5.0 (92%)			10°				
							10°	1 mm			
441							70°	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								1 mm			
443							20°	1 mm			
444							85°	2 mm			
							90°	3 mm			
445		91	5.0/5.0 (100%)	5.0/5.0 (100%)			85°	1 mm			BOX 47
446							20°	1 mm			
447							85°	1 mm			
448											
449							80°	1 mm			
450		92	5.0/5.0 (100%)	4.8/5.0 (96%)							

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 42 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.)
451											
452									FINE TO MEDIUM GRAINED BASALT, FEW 1 mm VESICLES, GRAY (N5) TO DARK GRAY (N4)		
453							85°	1 mm			
							30°				
454								10 mm	VOID WITH RUBBLE		
455		93									BOX 48
							40°				
456			5.0/5.0 (100%)	3.1/5.0 (62%)			70°				
							70°		FINE TO MEDIUM GRAINED BASALT, DARK GRAY (N4) FEW VESICLES GREATER THAN 1 mm		
457							85°		VERY FRACTURED		
							60°				
458											
							60°				
459									INCREASE IN VESICLE SIZE TO 1-3 mm		
460		94									
							60°	1 mm			
			5.0/5.0 (100%)	4.1/5.0 (82%)			80°	1 mm			
461							80°	1 mm			

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	43 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.)
462							60°	2 mm			
							85°	1 mm			
463											
464											BOX 49
								5-40 mm	GRADES TO MEDIUM GRAINED BASALT, DARK GRAY (N4) VESICLES 3-8 mm WITH CINDERS OF DUSKY RED (10R 3/2)		
465											
		95					50°				
466			5.0/5.0 (100%)	4.5/5.0 (90%)					CINDERS (20 cm) DUSKY RED (10R 3/2)		
							80°				
							80°				
467											
							75°				
468											
							40°		GRADES TO FINE GRAINED BASALT, DARK GRAY (N4), FEW VESICLES OVER 1 mm VERY BROKEN LOCALLY		
469								10 cm			
							60°				
470									INCREASE IN VESICLES SIZE TO 1-5 mm		
		96					60°				
			5.0/5.0 (100%)	2.9/5.0 (58%)							
							80°				
471							80°				
							70°		VESICULAR BASALT, WITH VESICLES UP TO 10 mm GENERALLY 2-6 mm DARK GRAY (N4) WITH DUSKY RED (10R 3/2) IN VESICLES		
472											
							40°				

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	44 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.)
473											BOX 50
									BASALT, GRADES TO DUSKY RED (10R 3/3)		
474											
							70°				
475											
		97	1.0/1.0 (100%)	1.0/1.0 (100%)					BASALT, GRADES TO DARK GRAY (N4), VESICLES 2-5 mm		
476											
		98	3.7/4.0 (74%)	3.3/4.0 (66%)							
477											
478											
							40°		BROKEN TO RUBBLE		
479							40°				
									GRADES TO VERY FINE GRAINED OLIVINE BASALT, DARK GRAY (N4) FEW VESICLES TO 5 mm GENERALLY <1 mm.		
480											
		99	5.0/5.0 (100%)	4.0/5.0 (80%)							
481											
482							30°				
								2 mm			
483							40°	2-5 mm	FINE TO MEDIUM GRAINED BASALT, VESICLES 3-8 mm		BOX 51
							70°	1 mm			

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	45 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.)
484								1-2 mm			
485											
		100									4/26/08
			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		
487											
488									GRADES TO LARGER VESICLES OF 5-10 mm		
489									20-25 mm VOID WITH CINDERS, RED (10R 4/6)		
							10°	2-3 mm			
490											
		101									
			5.0/5.0 (100%)	4.6/5.0 (92%)			70°	2-3 mm	VESICULAR OLIVINE BASALT, DARK GRAY (N4) WITH TRACE RED (10R 4/6) LOCALLY VESICLES 2-5 mm		
491							70°	2 mm			
492											BOX 52
							80°	4 mm			
							80°	3 mm			
493							20°	1 mm			
494								3 mm			
								0-10°	VERY FRACTURED		

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	46 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.)
495		102					70°				
496			5.0/5.0 (100%)	3.3/5.0 (66%)			60°		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'		
497							40°				
							10°				
498							80°				
							70°				
499							60°	1 mm			
500		103					50°	1 mm			
501			5.0/5.0 (100%)	3.3/5.0 (66%)					LARGER VESICLES FROM 501-504', UP TO 10 mm, GENERALLY 2-5 mm WITH CINDERS OF WEAK RED (10R 4/3)		
502							40°	3-10 mm			BOX 53
503							40°				
							40°				
504								1-3 mm			
							50°				
505		109							GRADES TO VERY FINE GRAINED BASALT, DARK GRAY (N4) WITH SOME DUSKY RED (10R 3/4) ALONG FRACTURES		
			5.0/5.0 (100%)	4.8/5.0 (96%)							

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 47 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.)
506							50°				
507							50°	1-3 mm			
508									GRADES TO GRAY (N5)		
509											
510		110	5.0/5.0 (100%)	3.3/5.0 (66%)			70° 70° 70°	5-10 mm	WITH CINDERS OF WEAK RED (10R 4/4)		
511									VESICULAR BASALT, DARK GRAY (N4), VESICLES 2-8 mm		BOX 54
512							50°	1 mm			
513							80°		GRADES TO DUSKY RED (10R 3/3)		
514							85°	40 mm 80 mm	VOID WITH CINDERS BLACK (N2.5) WITH SOME IRIDESCENCE LOCALLY		
515		111	5.0/5.0 (100%)	5.0/5.0 (100%)					VESICULAR BASALT, DARK GRAY (N4), VESICLES UP TO 10 mm GENERALLY 2-5 mm		
516									10x20 mm VOID		
									10x40 mm VOID		

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 48 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.)
517							60°	1 mm			
518											
519							85°	1-2 m			
							85°				
520		112									
			5.0/5.0 (100%)	4.7/5.0 (94%)							
521											BOX 55
							85°	1-2 m			
522							85°	1 mm			
									GRADES TO FINE GRAINED BASALT, DARK GRAY (N4) WITH 1-3 mm VESICLES, GENERALLY 1 mm		
523											
							70°	1 mm			
524											
								1 mm			
							85°				
525		113									
			5.0/5.0 (100%)	4.6/5.0 (92%)			85°	1 mm			
526							75°	1 mm	BASALT, AS ABOVE WITH TRACE DUSKY RED (10R 3/2) LOCALLY ALONG FRACTURES		
							90°	1 mm			
							80°	2 mm			
527											
									FEW VUGS UP TO 10 mm		

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 49 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.)
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											
								5-10 mm	VOID		
532							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		
533							85°	2 mm			
534											
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		

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	50 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.)
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°		FINE TO MEDIUM GRAINED BASALT, WEAK RED (10R 4/3), VESICLES UP TO 10 mm		
							50°	2 mm			
542							10°				
							20°				
543								2-3 mm			
544									BASALT, GRADES TO DUSKY RED (10R 3/2) SMALL VESICLES APPROX 1 mm FEW 3-4 mm		
545		117	5.0/5.0 (100%)	5.0/5.0 (100%)			60°				
546									FINE GRAINED BASALT, DARK GRAY (N4) TO BLACK (N2.5) WITH SMALL VESICLES 1-2 mm		
547									FEW HORIZONTAL ZONES OF VESICLES 3-8 mm	TEST P-3 K_h= 5.8E-04	
548											
549							85°	1 mm			BOX 58

1005746D012-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core 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 (%)	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.)
550		118	5.0/5.0 (100%)	4.9/5.0 (98%)							
551											
552							40°	1 mm			
553							90°				
554							30°				
555							30°		GRADES TO LARGER VESICLES AND DUSKY RED (10R 4/4)		
		119	4.9/5.0 (98%)	4.6/5.0 (92%)							
556							85°	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		
557							80°				
							85°				
							80°				
558							85°	1-2 m			BOX 59
								1 mm			
559							30°	1-2 m			
560		120	5.1/5.0 (102%)	4.8/5.0 (96%)					FEW HORIZONTAL VUGS		
							75°	1 mm			

1005746D013—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 52 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.)
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							50°				
569							50° 40°		FRACTURED TO RUBBLE		
570		122	5.0/5.0 (100%)	4.7/5.0 (94%)			10° 80°	2 mm	BLACK (N2.5) BASALT, WITH ABUNDANT 1-2 mm VESICLES		
571							70°	1 mm			

1005746D013—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	53 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.)
572							90°				
573											
							85°	10 mm	SOME RUBBLE		
574											
							85°	1 mm			
575							40°				
		123									
			5.0/5.0 (100%)	4.6/5.0 (92%)				1-2 mm	FINE GRAINED BASALT, VERY DARK GRAY (N3), VESICLES APPROX 1 mm OR LESS WITH HORIZONTAL VUGS/VESICLES		
576							80°				
577											BOX 61
							75°	1-2 mm			
578									HORIZONTAL VUGS/VESICLES		
579											
580											
		124							HORIZONTAL VUGS/VESICLES		
			5.0/5.0 (100%)	5.0/5.0 (100%)							
581											
							90°	1 mm			
582											
									HORIZONTAL VUGS/VESICLES		

1005746D013—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 54 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.)
583											
584							85°	5 mm	HORIZONTAL VUGS/VESICLES		
585		125	5.0/5.0 (100%)	5.0/5.0 (100%)							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							85°	1-2 mm			
588								2-5 mm	0-10° WITH 2-5 mm FRACTURES		
589							85°				
590		126	5.0/5.0 (100%)	5.0/5.0 (100%)			0-10°				
591									HORIZONTAL VUGS VESICULATED BASALT, < 1 mm 20° FRACTURE OFF VERTICAL FRACTURE		
592									FRACTURE 2-3 mm		
593											

1005746D013—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	55 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.)
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° 50°		VERY FRACTURED		
600		128	5.0/5.0 (100%)	3.4/5.0 (68%)			70°				
601							30°	50°	FINE GRAINED OLIVINE BASALT, AS ABOVE, VERY FRACTURED LOCALLY, FRACTURES 1-5 mm		
602							50°				
603							40° 60°				
604								3 mm 50°			BOX 64

1005746D013—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	56 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.)
605		129	5.0/5.0 (100%)	5.0/5.0 (100%)							
606									FINE GRAINED OLIVINE BASALT, DARK GRAY (N4), VESICLES LESS THAN 1 mm		
							85°	1 mm			
607										TEST P-2, K_h= 2.0E-04	
608							50°	1 mm			
609							50°	2 mm			
							20°	2 mm			
610		130	5.0/5.0 (100%)	5.0/5.0 (100%)				1 mm			
611							30°				
612											
613							30°				BOX 65
								1 mm			
614											
615		131	5.0/5.0 (100%)	3.7/5.0 (74%)							

1005746D013-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 57 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.)
616							0-10°	5 mm			
617							50°				
							60°	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_h = 1.8 E-04	
618							10-20°	2-3 mm			
619									RUBBLE		
620		132	5.0/5.0 (100%)	4.6/5.0 (92%)			40°				
621								1 mm			
622							30°	3-4 mm			BOX 66
623									VUGS/VESICLES UP TO 40 mm		
624								1 mm			
								3 mm	BASALT, GRADES TO DARK REDDISH GRAY (10R 3/1) AND VESICLES LESS THAN 1 mm		
625		133	5.0/5.0 (100%)	4.2/5.0 (84%)							
626								1 mm	BASALT, GRADES TO DARK GRAY (N4)		
							75°				
							40°	1 mm			

1005746D013-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	58 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.)
627							80°	1 mm			
							10°				
628							70°	1-3 mm			
							20°				
629							80°				
									10x40 mm VOID		
630		134									
			5.0/5.0 (100%)	5.0/5.0 (100%)							
631											BOX 67
632											
633									20 x 30 mm VOID		
634											
635		135	5.0/5.0 (100%)	5.0/5.0 (100%)							
							80°				
636								2-3 cm			
637									BASALT, DUSKY RED (10R 3/3) GRADES TO LARGER VESICLES		

1005746D013-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 59 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.)
638											
							10°	1-2 mm	BASALT, GRADES TO FINE GRAINED DARK GRAY (N4), VESICLES LESS THAN 1 mm VESICLES 2-5 mm LOCALLY		
639											
640		136	5.0/5.0 (100%)	5.0/5.0 (100%)							BOX 68
641											
642									2-5 mm VESICLES		
643											
644											
645		137	5.0/5.0 (100%)	3.2/5.0 (64%)							4/28/08
646											
							30°	1-2 mm			
647									WITH HORIZONTAL VESICLES UP TO 5 mm		
							70°				
648							80°	1 mm			
								1 mm			
							50°				

1005746D013-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 60 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.)
649							50°				
								1 mm			
							60°				
650							70°	1 mm			BOX 69
		138	1.0/1.0 (100%)	0.6/1.0 (60%)					VERY FINE GRAINED OLIVINE BASALT, DARK GRAY (N4) VESICLES OF 1 mm		
651							60°				
		139	4.0/4.0 (100%)	3.4/4.0 (85%)			70°				
							70°	1-2 mm			
652							70°				
							70°				
653							80°				
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							30°				
								1 mm	WITH WEAK RED (10R 4/3) ALONG FRACTURE		
659											BOX 70

1005746D013-A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	61 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.)
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									WITH TRACE 5 mm VESICLES		
		144									
666			5.0/5.0 (100%)	3.9/5.0 (78%)							
							50°				
667									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											
							85°	1 mm			
670									GRADES TO DARK GRAY (N4) WITH FEW VESICLES UP TO 10 mm, GENERALLY 1-3 mm		
		145	5.0/5.0 (100%)	5.0/5.0 (100%)							

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 62 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.)
671							85°	2 mm			
672											
673							85°	1 mm			
674							70°	1 mm			
							85°	1 mm			
675									FINE GRAINED BASALT, DARK GRAY (N4) VESICLES 1 mm OR LESS		
		146									
676			5.0/5.0 (100%)	4.8/5.0 (96%)					WITH FEW VESICLES UP TO 10 mm		
677											
678											BOX 72
679									RUBBLE WITH SOME WEAK RED (10R 4/4)		
680		147							GRADES TO DARK REDDISH GRAY (10Y 4/1) WITH VESICLES OF UP TO 2 mm		
			5.0/5.0 (100%)	2.5/5.0 (50%)			80°				
681							85°	1 mm			
							60°	1 mm			

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 63 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.)
682							40°				
								1-2 mm			
683							40°				
							40°				
							10°				
684									VERY BROKEN, DARK REDDISH GRAY (10Y 4/1) TO DARK GRAY (N4)		
685									VERY FRACTURED 683.5-687'		
		148	5.0/5.0 (100%)	2.9/5.0 (58%)			40°				
686									SOME WEAK RED (10R 4/3) IN FRACTURES LOCALLY		
687							40°				
688									WITH VUGS UP TO 20 mm		BOX 73
689							85°	2-3 mm			
							10°				
690		149	5.0/5.0 (100%)	4.3/5.0 (86%)					BASALT, GRADES TO DARK REDDISH GRAY (10Y 4/1) WITH ABUNDANT 2-4 mm VESICLES, SOME VESICLES UP TO 15 mm LOCALLY		
691							80°				
							70°	1-2 mm			
							50°				
692							70°		BASALT, GRADES TO FINE GRAINED DARK GRAY (N4), VESICLES GENERALLY 1 mm		
							80°				

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.: GW-1			
Sheet No.: 64 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.)
693							0-10°				
							50°				
							20°				
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)		
							30°				
696											
									RUBBLE		
697											BOX 74
							40°				
698											
									VUGS/VOIDS UP TO 15 mm		
699									2 x 35 mm VOID		
							30°				
700		151	5.0/5.0 (100%)	5.0/5.0 (100%)							
701									FINE GRAINED BASALT, DARK GRAY (N4) WITH VUGS/VOIDS UP TO 15 mm		
702							80°	1 mm			
703							70°	2 mm	10 x 30 mm VOID		

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	65 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.)
704											
705		152							WITH VUGS AND VOIDS UP TO 15 mm		4/29/08
			4.8/5.0 (96%)	4.8/5.0 (96%)					VESICULATED BASALT, WITH VESICLES UP TO 20 mm		
706											BOX 75
							30°	1-2 mm			
707											
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°				
							20°				
							20°				
714							30°				

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	66 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.)
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°				
							40°				
718											
719											
720							40°				
		155	5.0/5.0 (100%)	4.5/5.0 (90%)			30°		SLIGHTLY VESICULAR BASALT, WITH VESICLES GENERALLY 1 mm		
721							50°				
722											
723							20°				
724							50°				
725							40°				
		156	5.0/5.0 (100%)	2.5/5.0 (50%)							

1005746D014—A.dwg

ROCK BORING LOG

MWH

Project: Areva
Feature: Core Log

Hole No.:	GW-1
Sheet No.:	67 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.)
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)

SUMMARY OF LABORATORY TEST RESULTS

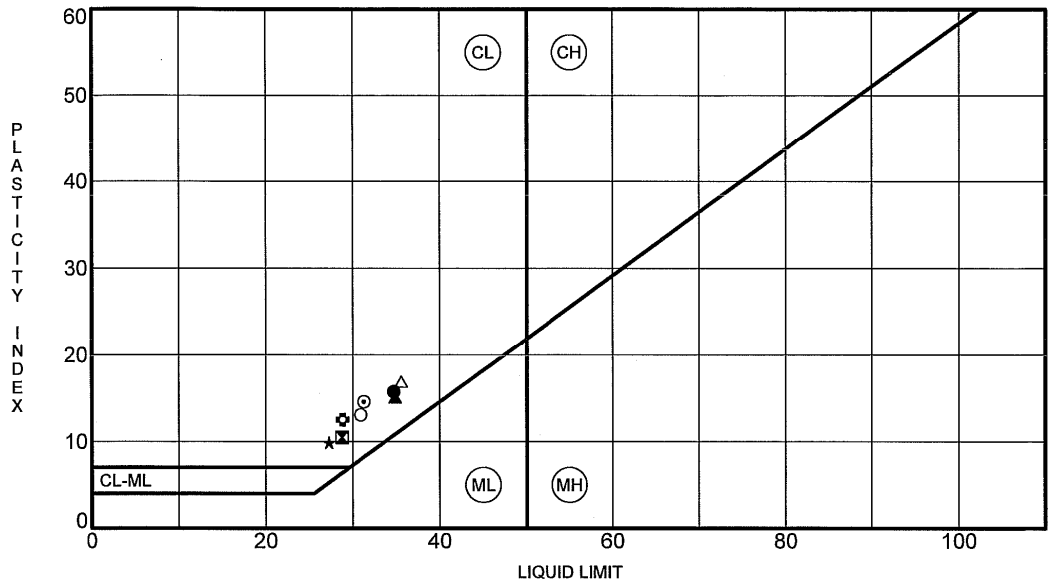
Terracon Project No. 20075108

Boring No.	Depth (ft.)	USCS Soil Classification	Initial Dry Density (pcf)	Initial Water Content (%)	Swell/Consolidation		Particle Size Distribution, Percent Passing by Weight					Atterberg Limits		Water Soluble Sulfates (mg/l)	Remarks
					Surcharge (ksf)	Swell (%)	3"	#4	#10	#40	#200	LL	PI		
BH 1	10	CL	104.4	15.5							84	35	16		4
BH 5	5	CL		13.6							96	29	13		4,6
BH 6	5	CL		9.6							96	31	13		4,6
BH 7	5	CL	112	14.1							91	36	17		4,6
BH 10	5	CL		10.9							89	29	11		4
BH 12	10.5	CL	88	12	0.5	-1.8					98	35	15		3,4,6
BH 14	5	CL		11.8							94	27	10		4,6
BH 18	5.5	CL		15.1							95	31	14		4,6

Notes:
Initial Dry Density, Initial Water Content, and Swell/Consolidation values obtained from undisturbed samples unless otherwise noted
* = Partially disturbed sample
- = Compression/settlement
NV = no value
NP = non-plastic

REMARKS
1 Remolded Compacted density (approximately 95% of ASTM D698 maximum density near optimum)
2 Remolded Compacted density (approximately 95% of ASTM D1557 maximum density near optimum)
3 Submerged to approximate saturation
4 Dry density and/or moisture content determined from one ring of a multi-ring sample
5 Visual Classification
6 Minus #200 Only

Terracon



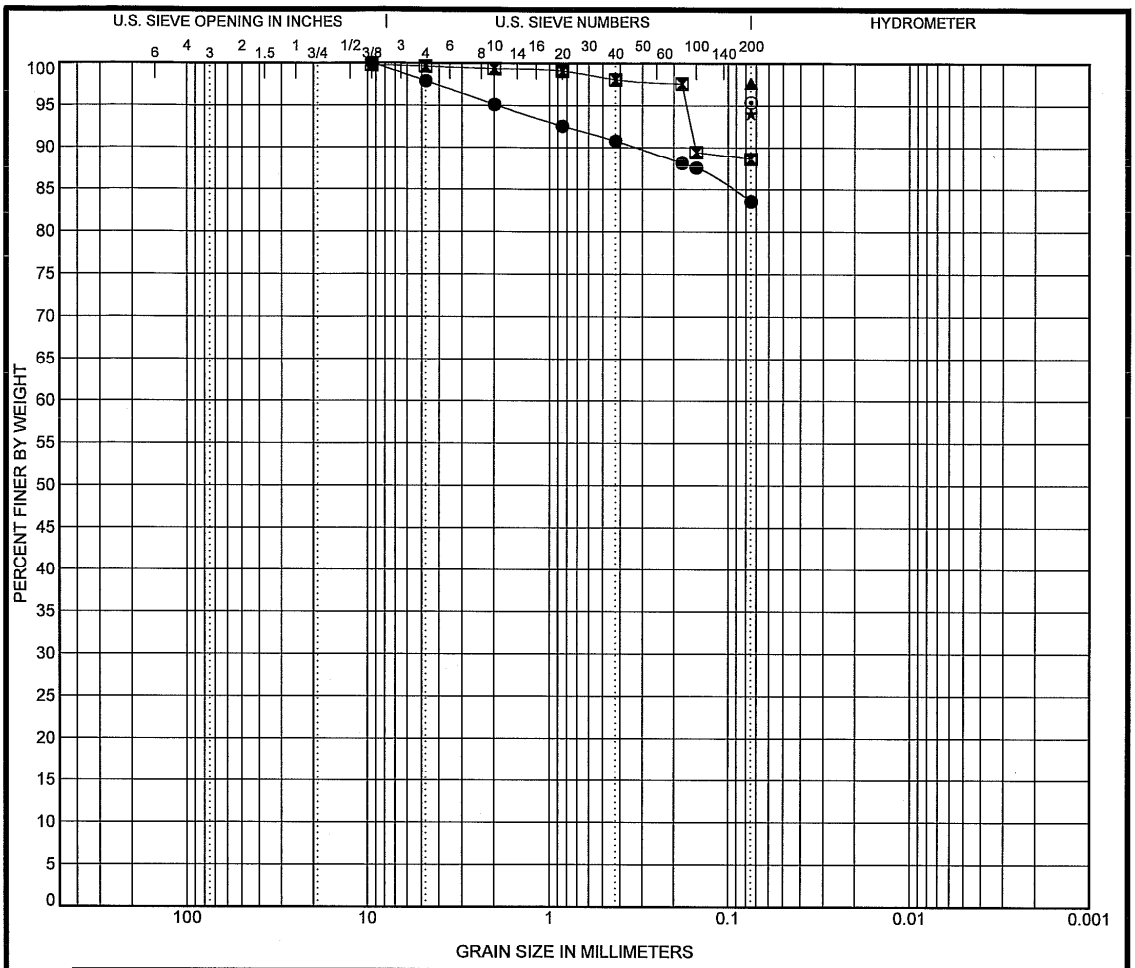
	Specimen Identification		LL	PL	PI	%Fines	Classification
●	**BH 1**	**10.0ft**	**35**	**19**	**16**	**84**	**LEAN CLAY with SAND(CL)**
⊠	**BH 10**	**5.0ft**	**29**	**18**	**11**	**89**	**LEAN CLAY(CL)**
▲	**BH 12**	**10.5ft**	**35**	**20**	**15**	**98**	**LEAN CLAY(CL)**
★	**BH 14**	**5.0ft**	**27**	**17**	**10**	**94**	**LEAN CLAY(CL)**
⊙	**BH 18**	**5.5ft**	**31**	**17**	**14**	**95**	**LEAN CLAY(CL)**
✿	**BH 5**	**5.0ft**	**29**	**16**	**13**	**96**	**LEAN CLAY(CL)**
○	**BH 6**	**5.0ft**	**31**	**18**	**13**	**96**	**LEAN CLAY(CL)**
△	**BH 7**	**5.0ft**	**36**	**19**	**17**	**91**	**LEAN CLAY(CL)**

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

Terracon

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	

Terracon

GRAIN SIZE DISTRIBUTION

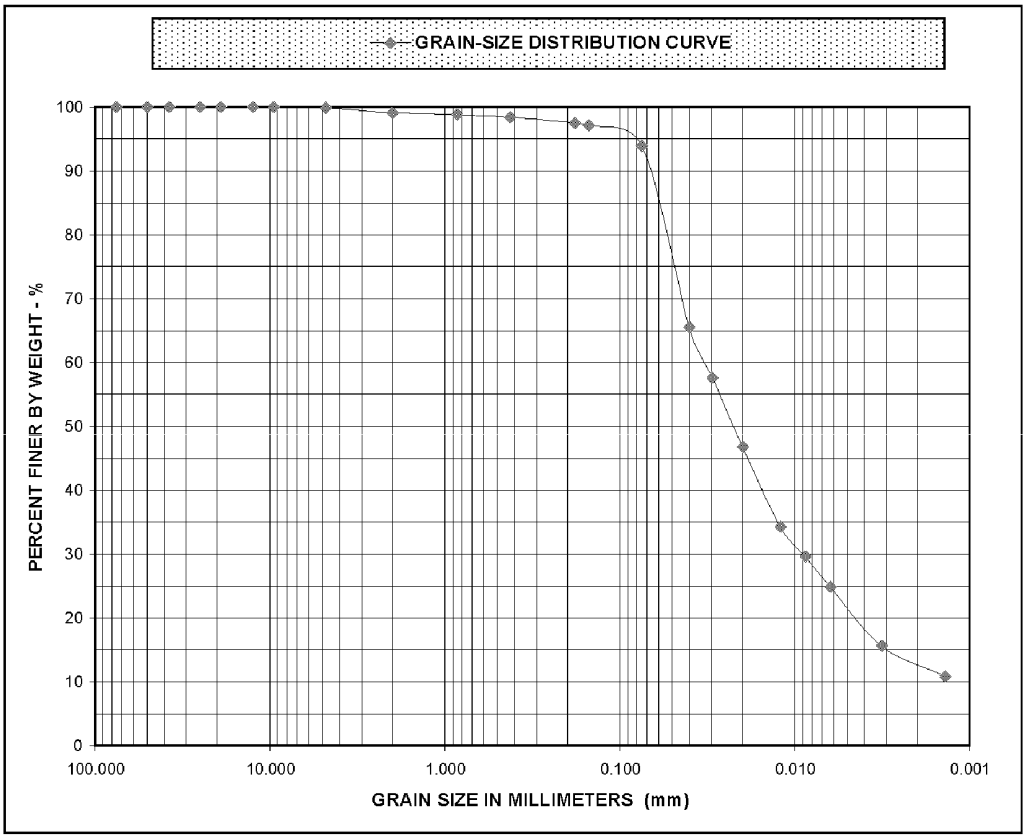
Project: Laboratory Testing
Site: Fort Collins, Colorado
Job #: 20075108
Date:

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

Terracon

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

CLIENT:	MWH	SAMPLED BY:	Client
PROJECT:		DATE RECEIVED:	3-Dec-07
PROJECT LOCATION:		REPORT DATE:	10-Dec-07
SAMPLE LOCATION:	BH-5 @ 5'	PROJECT NO:	20075108



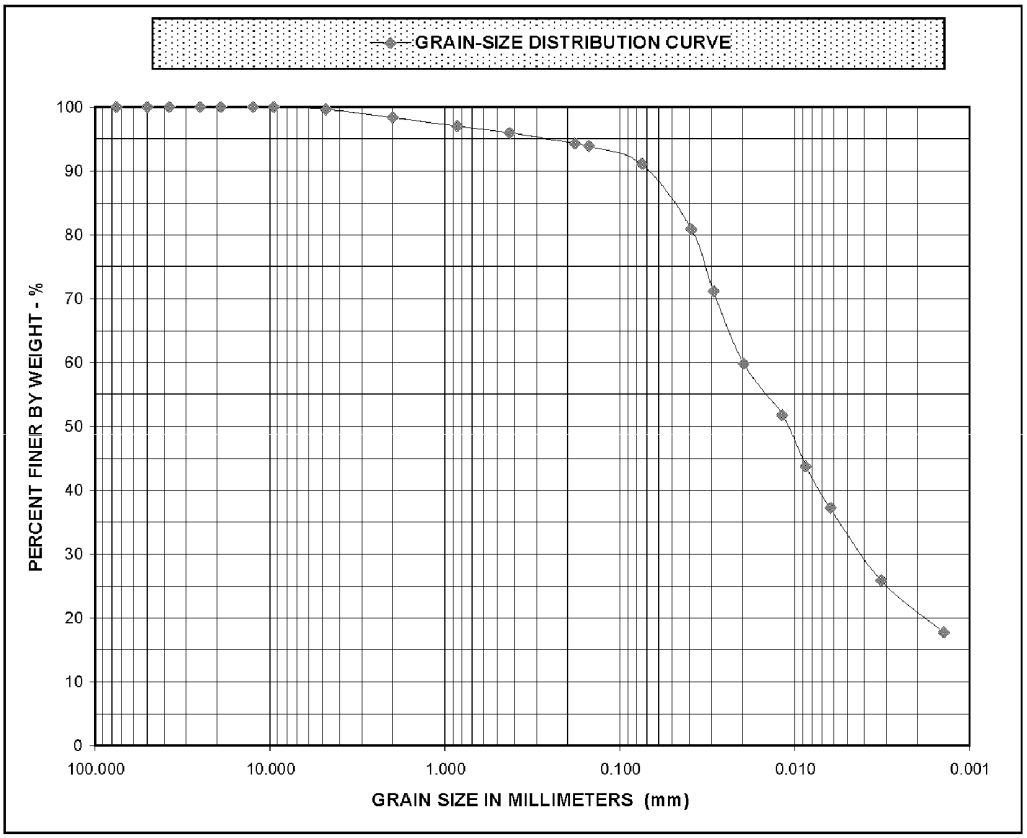
SAMPLE LOCATION	SOIL CLASSIFICATION	MC%	LL	PI	Cc	Cu
BH-5 @ 5'	CL	NR	29	13	1.94	25.90

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

Terracon

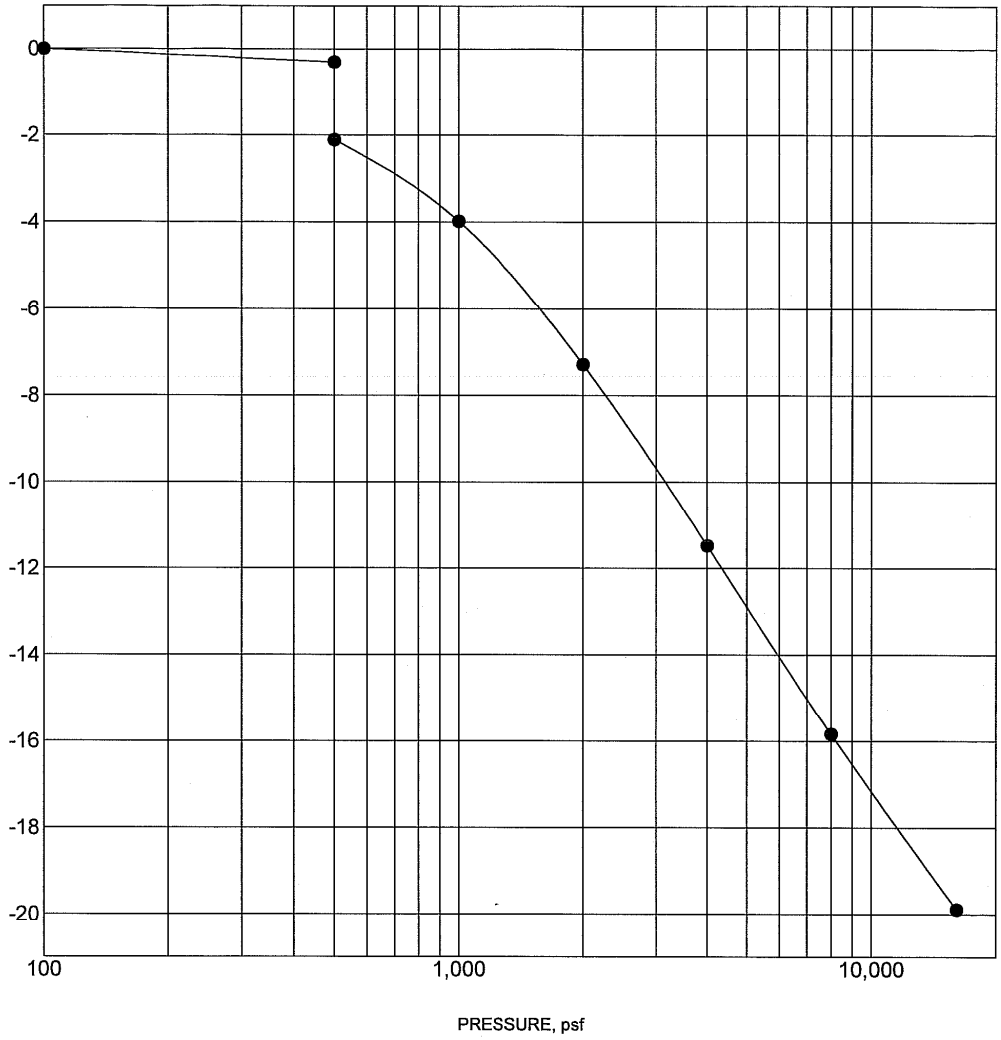
301 North Howes Street
Fort Collins, Colorado 80521
(970) 484-0359 FAX (970) 484-0454

CLIENT:	MWH	SAMPLED BY:	Client
PROJECT:		DATE RECEIVED:	3-Dec-07
PROJECT LOCATION:		REPORT DATE:	10-Dec-07
SAMPLE LOCATION:	BH-18 @ 5.5'	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



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

Notes:

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

Terracon

SWELL CONSOLIDATION TEST

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

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)

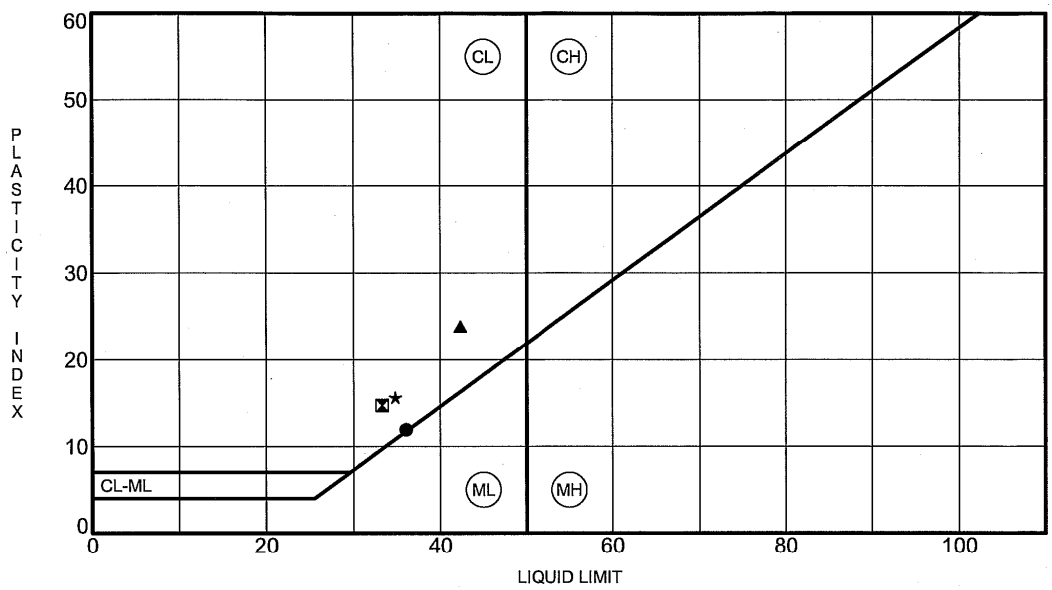
Borehole	Depth	Liquid Limit	Plasticity Index	% < #200 Sieve	AASHTO Class-ification	USCS Class-ification	Water Content (%)	Dry Unit Weight (pcf)	Swell (%)/ Surgharge (psf)	Unconfined Comp-ressive Strength (psf)	Water Soluble Sulfate (ppm)	Resistivity (OHM-CM)	PH	Oxidation Reduction Potential	Specific 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								

FC 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



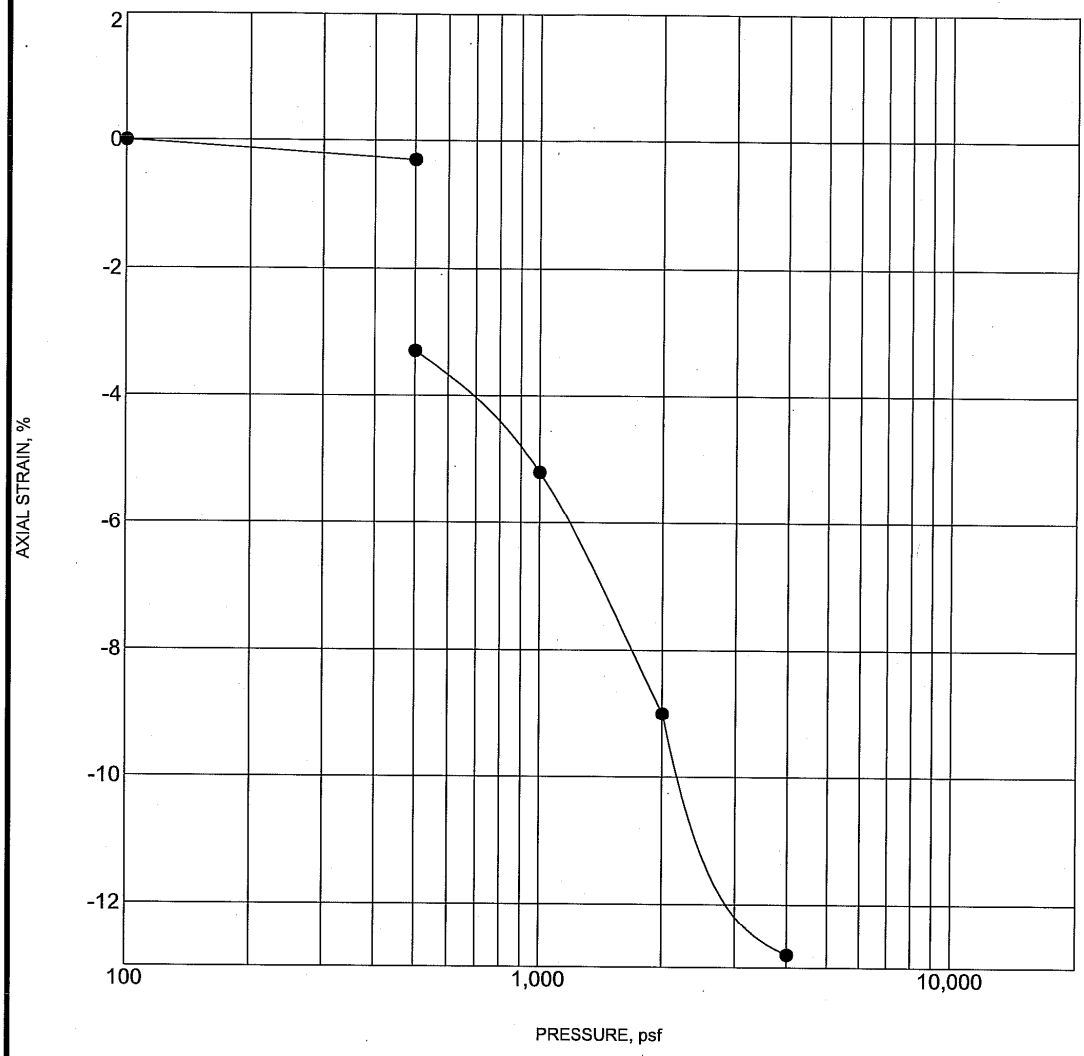
	Specimen Identification		LL	PL	PI	%Fines	Classification
●	23	1.0ft	36	24	12	89	LEAN CLAY(CL)
⊠	23	5.0ft	33	19	14	87	LEAN CLAY(CL)
▲	25	5.5ft	42	18	24	86	LEAN CLAY(CL)
★	30	5.5ft	35	19	16	97	LEAN CLAY(CL)

Terracon

ATTERBERG LIMITS RESULTS

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

TC ATTERBERG LIMITS 20075108.GPJ BORING.GDT 6/13/08



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

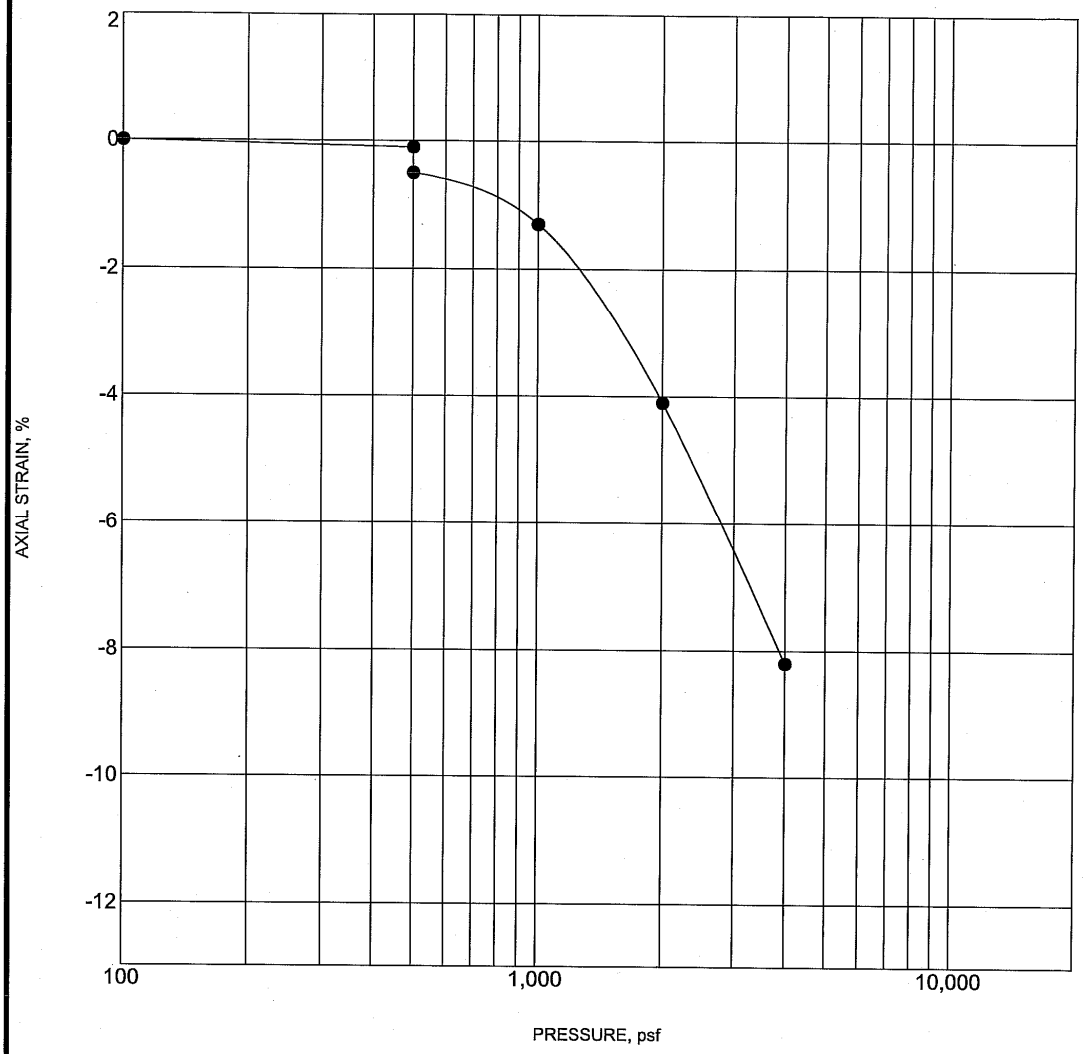
Notes:

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

Terracon

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

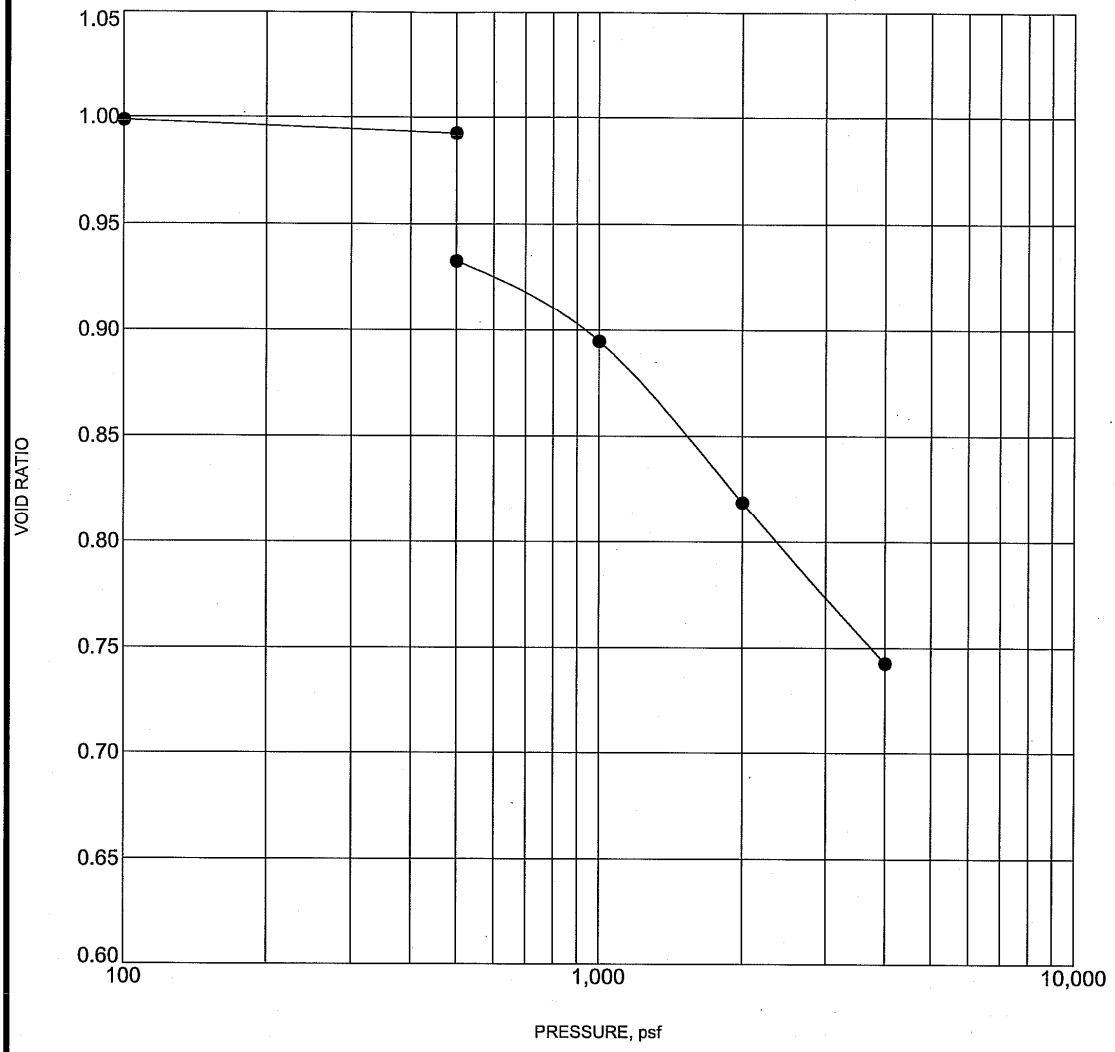
Notes:

Terracon

SWELL CONSOLIDATION TEST

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

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



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

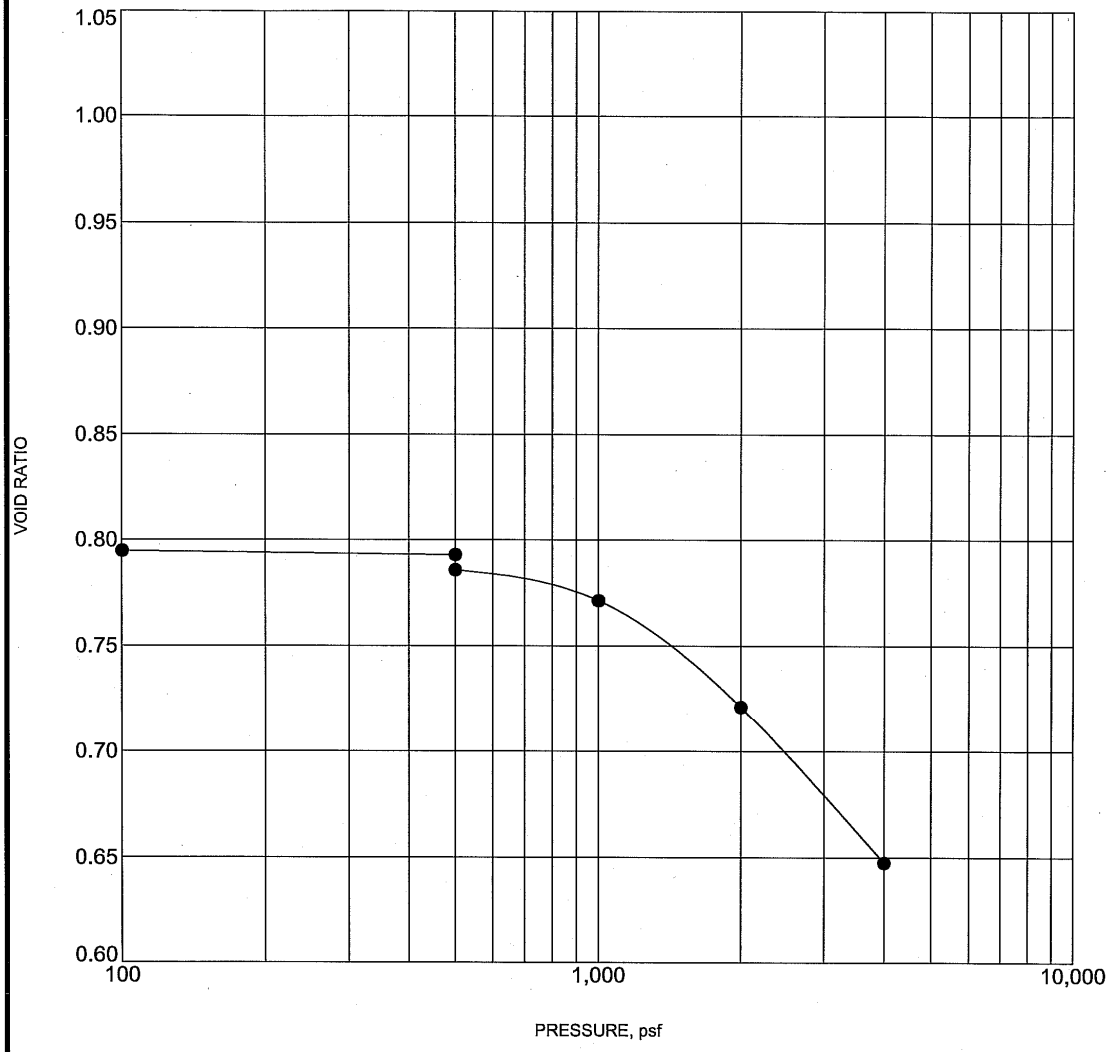
Notes:

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

Terracon

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

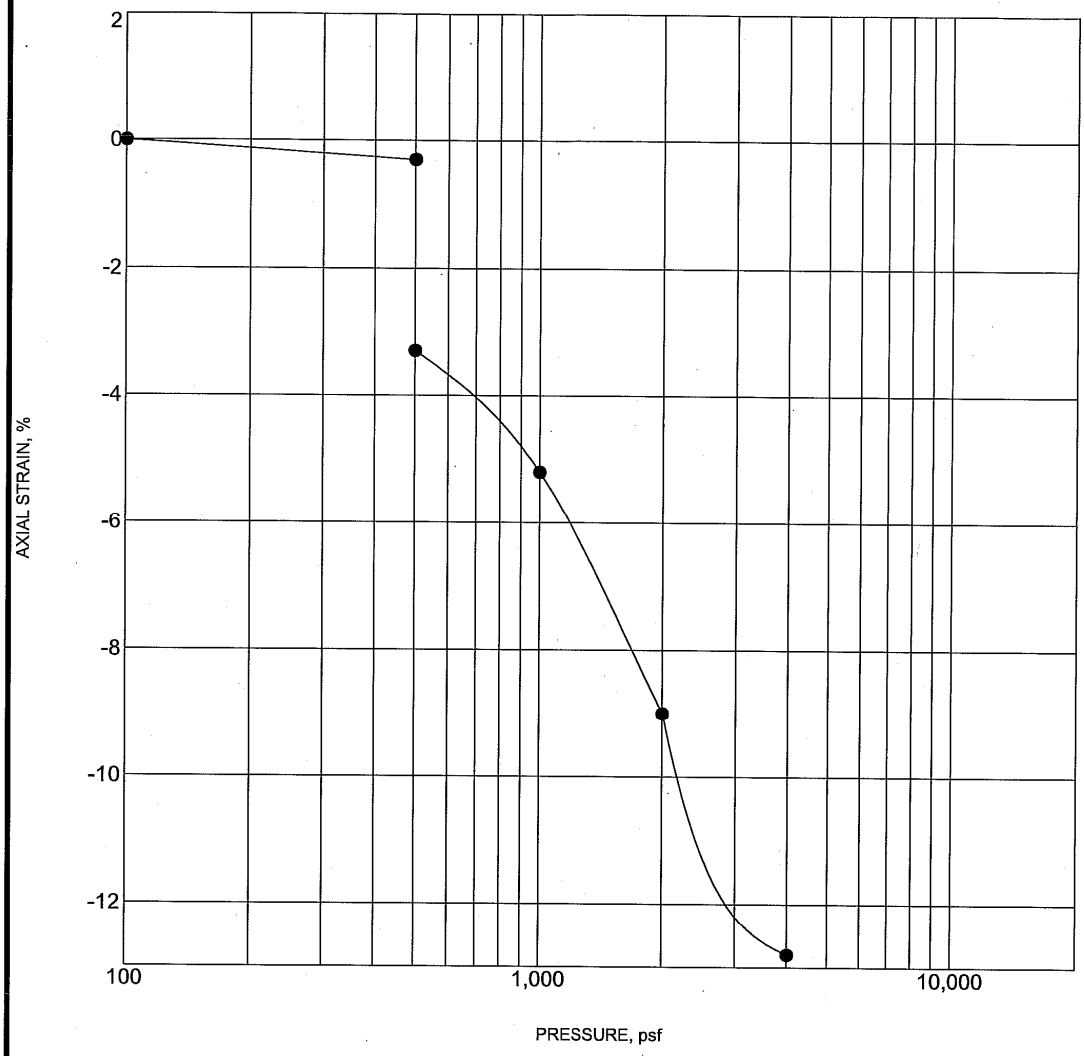
Notes:

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

Terracon

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

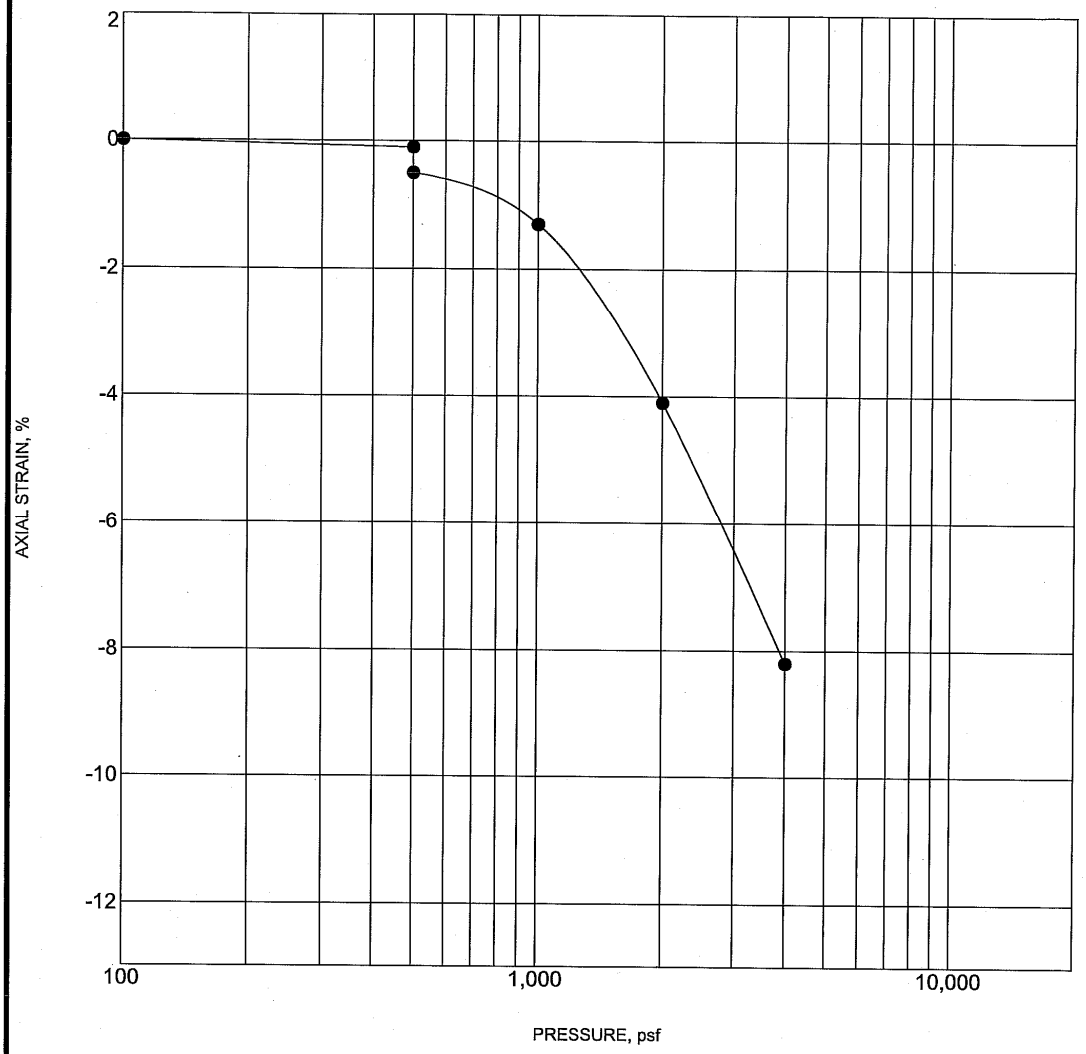
Notes:

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

Terracon

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

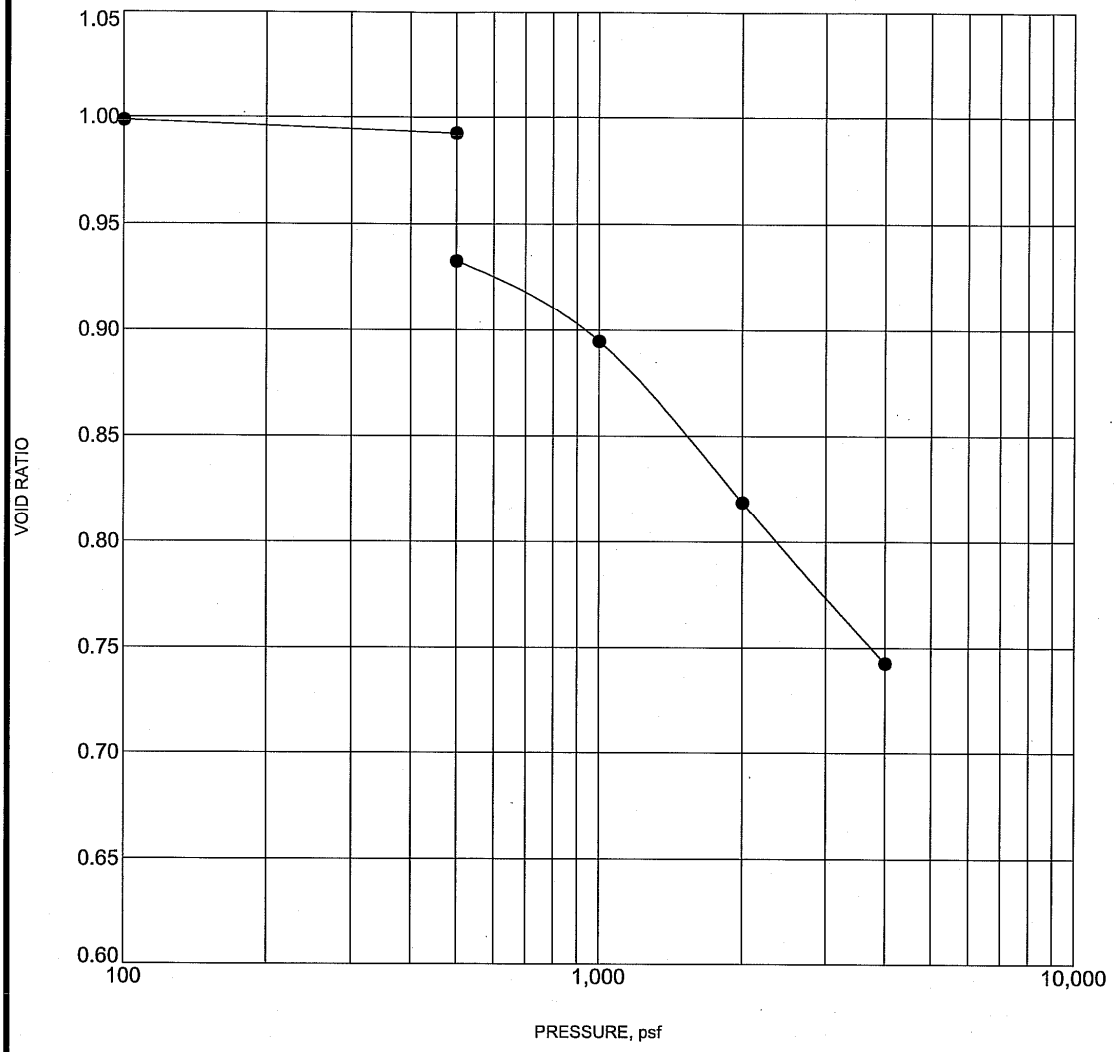
Notes:

Terracon

SWELL CONSOLIDATION TEST

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

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



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

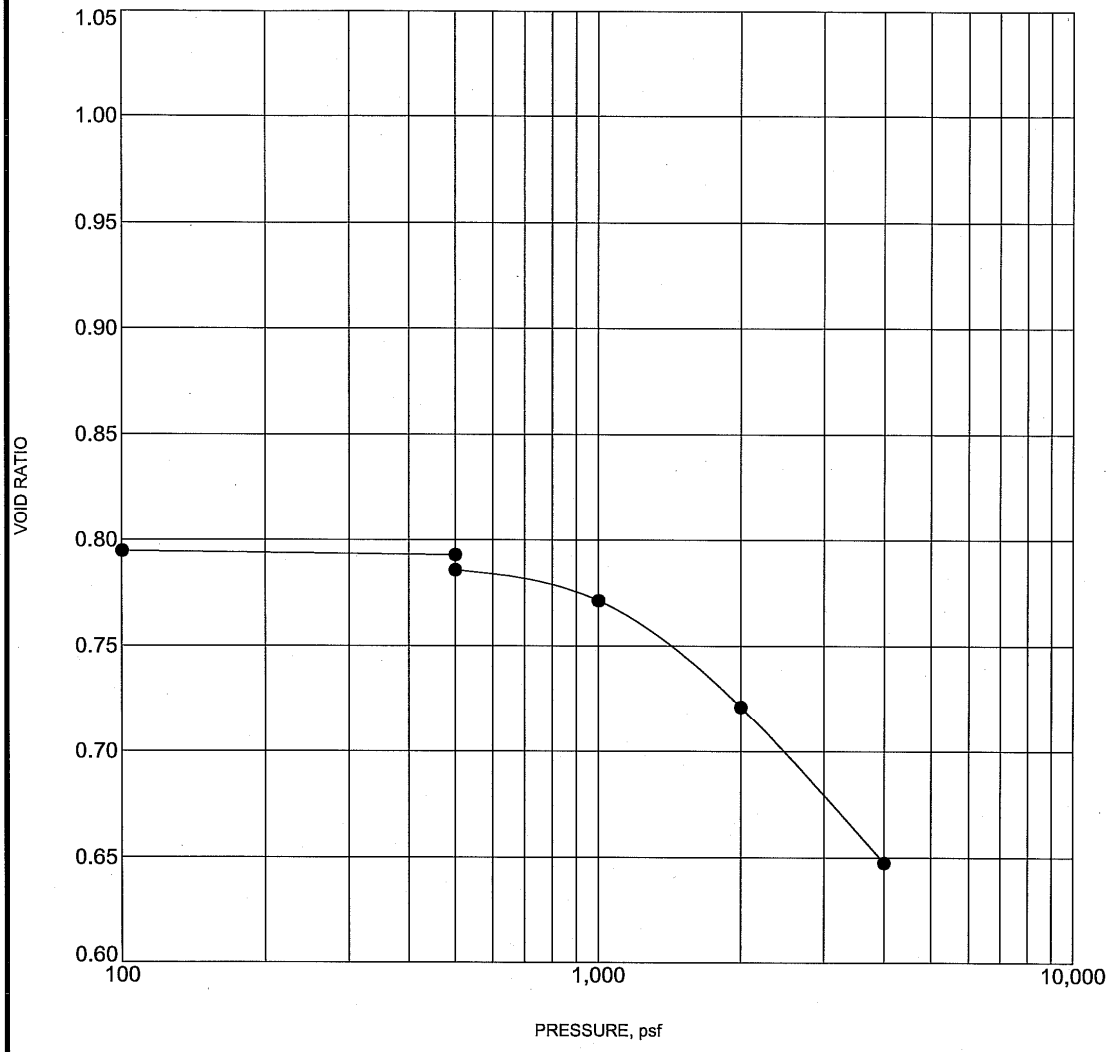
Notes:

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

Terracon

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

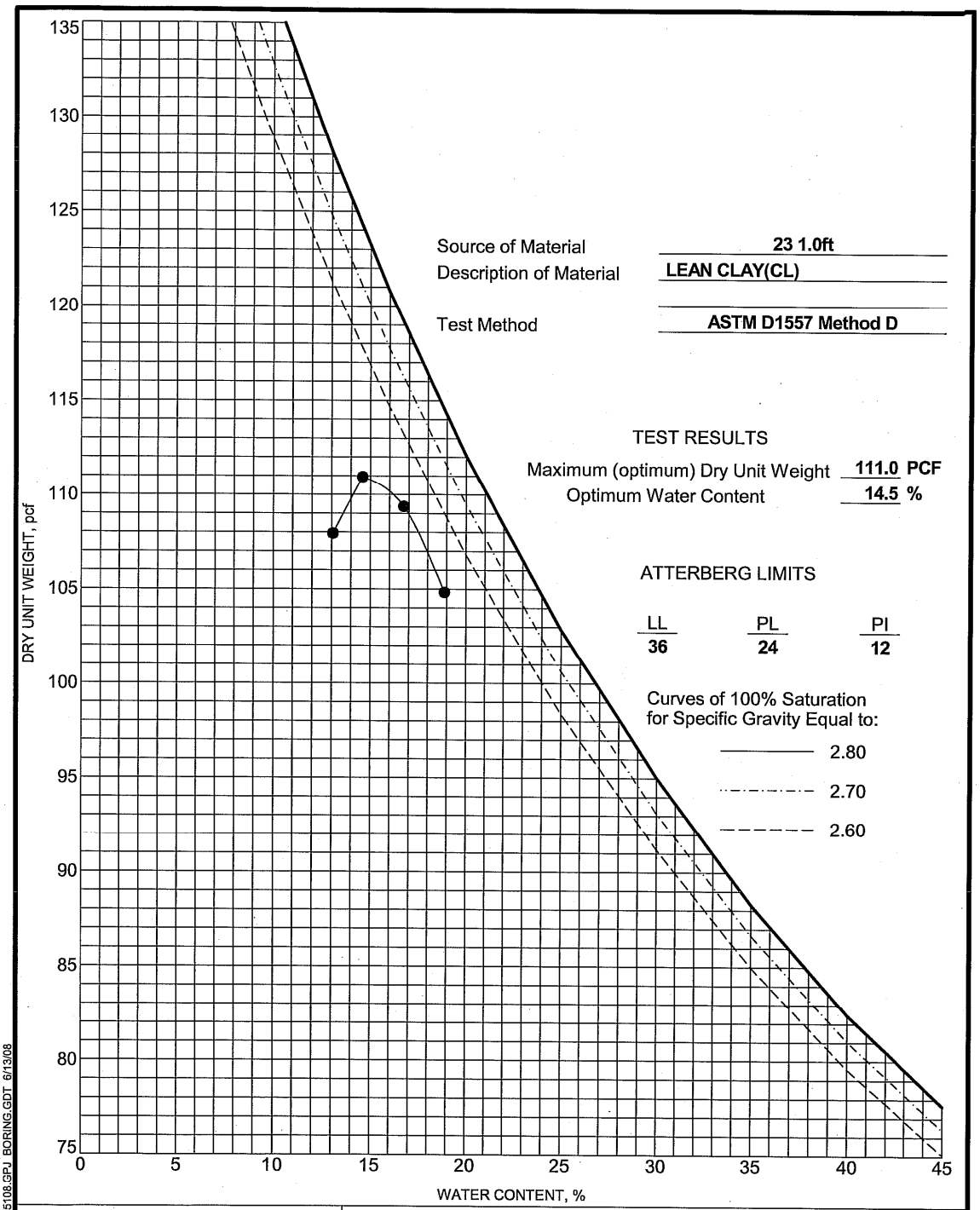
Notes:

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

Terracon

CONSOLIDATION TEST

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

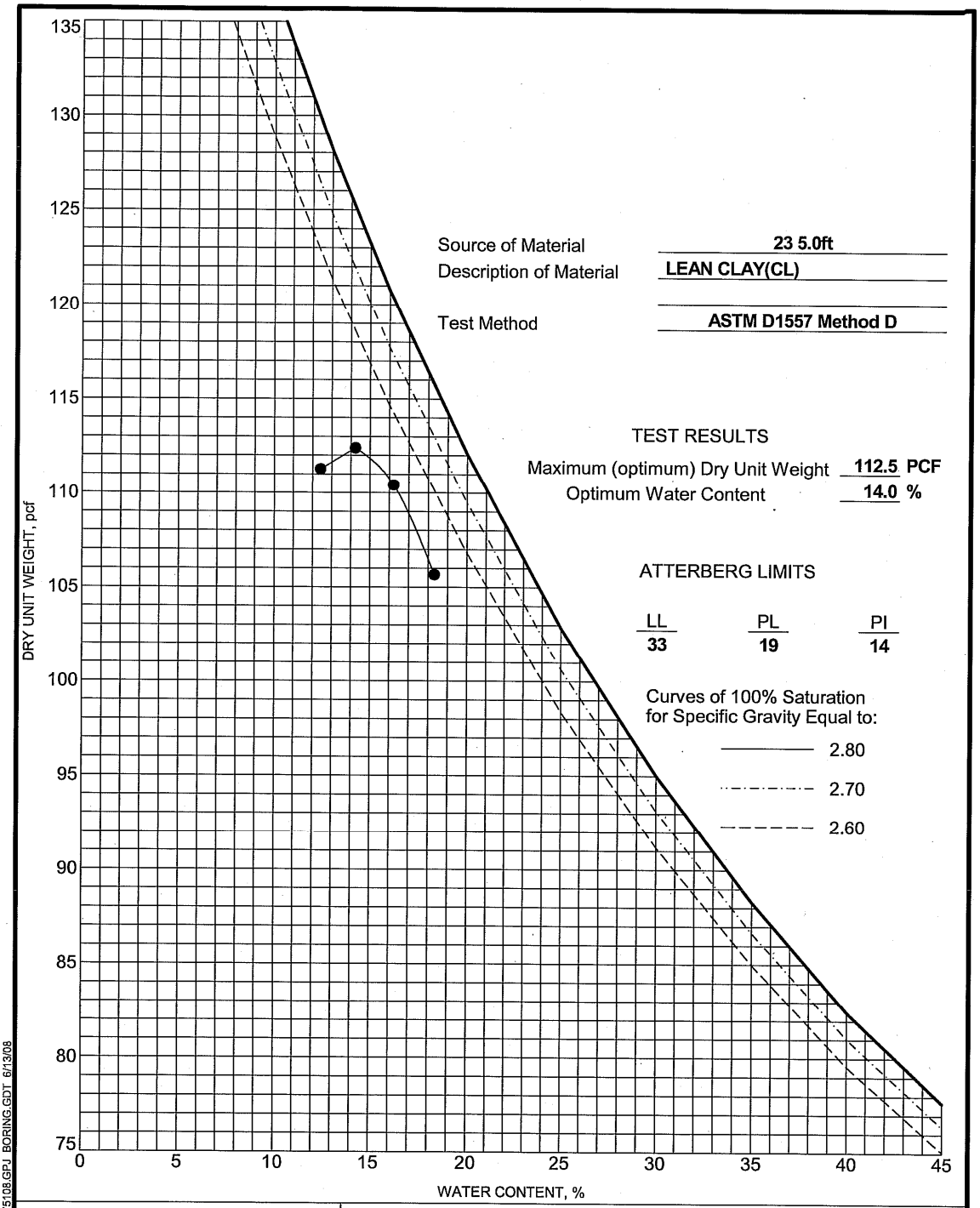


Terracon

MOISTURE-DENSITY RELATIONSHIP

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

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



Terracon

MOISTURE-DENSITY RELATIONSHIP

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

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

Terracon

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

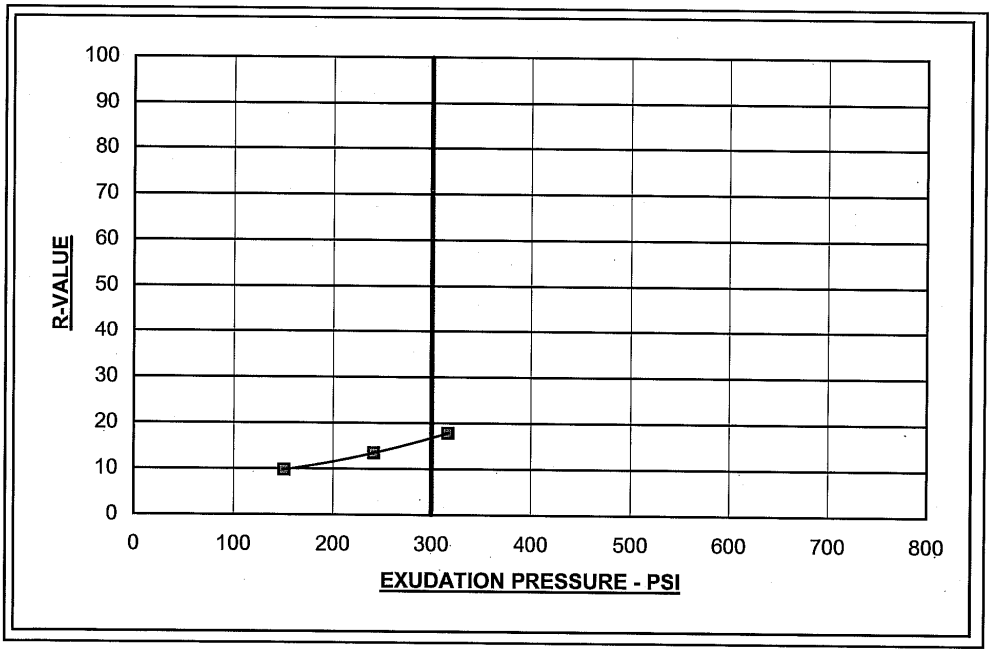
RESISTANCE R-VALUE & EXPANSION PRESSURE OF COMPACTED SOIL ASTM D2844

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

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



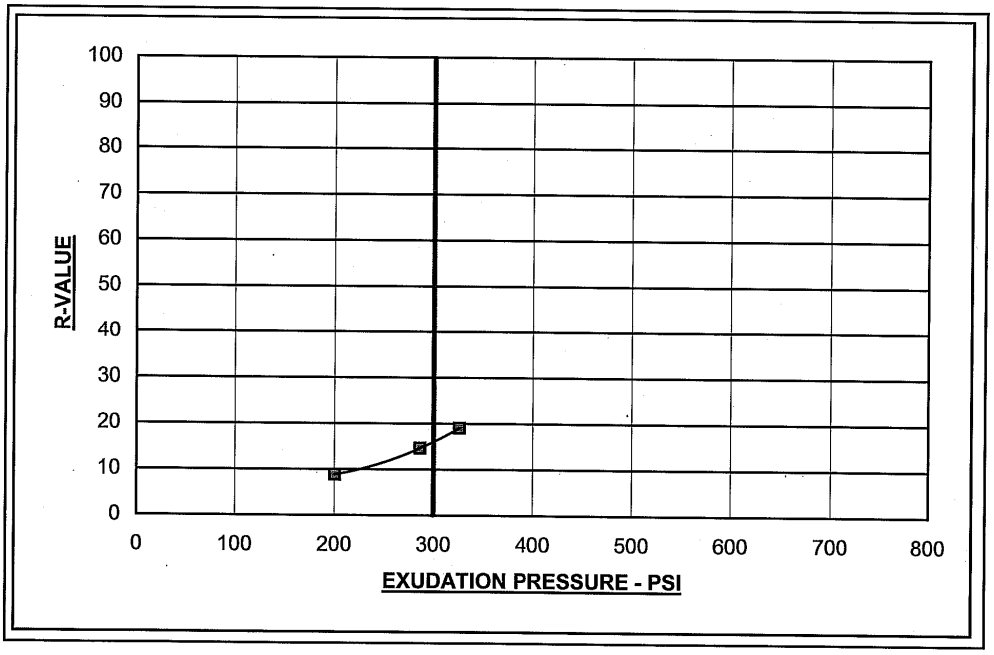
Terracon

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	**DATE OF TEST:**	29-May-08
PROJECT:	AREVA Idaho Falls Project		
LOCATION:	BH23 @ 5'		
TERRACON NO.	20075108	**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