



Shaw Environmental & Infrastructure, Inc.

RECEIVED MARCH 23, 2011

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Geotechnical Laboratory
304 Directors Drive
Knoxville, TN 37923
(865) 690-3211

EBER 0211066
RB 3-24-11

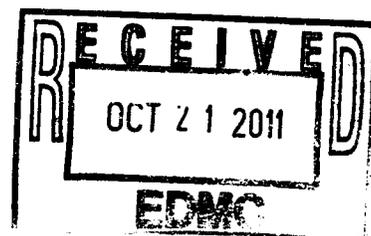
CERTIFICATE OF ANALYSIS

Mr. Michael Neely
CH2M Hill Plateau Remediation Company
P.O. Box 1600
Mail Stop – B6-06
Richland, WA 99352

March 23, 2011

This is the Certificate of Analysis for the following samples:

Shaw Project ID: Eberline Analytical
Shaw Project Number: 139736
Date Received by Lab: 02/24/11
Number of Samples: One (1)
Sample Type: Soil



I. Introduction/Case Narrative

One (1) soil sample was received by the Shaw Geotechnical Laboratory on February 24, 2011. The samples were submitted for determination of bulk density, particle size, and hydraulic conductivity/permeability as listed on the Chain of Custody/Sample Analysis Request. The sample number for the received sample was B29HN9.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and Appendix C, Chain-of-Custody/Sample Receipt Records

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature."

Reviewed and Approved:

R. Gregory Bennett
Geotechnical Laboratory Manager, Technology Applications Group

II. Analytical Results/Methodology

REFERENCES: United Nations, *Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria*, third ed. New York, 1999. United States Army Corps of Engineers (USACE), Engineer Manual 1110-2-1906, *Laboratory Soils Testing*, appendix II, 1970; United States Environmental Protection Agency, SW846, *Test Methods for Examining Solid Waste, Physical/Chemical Methods*, 3rd ed., Nov 1986 (EPA SW-846). Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, *Soil and Rock (I)*, and Volume 04.09, *Soil and Rock (II)*, 2008. Shaw Environmental and infrastructure, Standard Operating Procedures.

Bulk Density.....	ASTM D 2937
Particle Size (sieve only).....	ASTM D 422
Permeability.....	ASTM D 5084

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due largely to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and quality control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification of all numerical results - raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.
- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.
- Quality control procedures are built into most standardized geotechnical procedures. For example, liquid limit and plastic limit analyses call for re-analyses and specify acceptance criteria.
- Routine instrument calibration - instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.
- Maintenance of all past calibration records - calibration records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

- Certified and trained personnel - all technicians are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by Shaw.
- Quantitative analyses frequently used in geotechnical/physical testing programs do not use QC tools common to wet chemistry or radiochemistry laboratories. Measures not employed in the analysis of samples reported in this report include: laboratory control samples (LCS), blanks, matrix spikes (MS), duplicate analyses, dilutions, digestions, correction factors, surrogate sample analyses, detection limit determinations, control charts, and/or tentatively identified compounds (TICs).

IV. Data Qualification

None

Appendix A
Sample Cross-Reference List

Page 4 of 8
Report No.: EBER0211066
Mr. Michael Neely
Client: CH2M Hill Plateau Remediation Company
Shaw Project Name: Eberline Analytical
Shaw Project No.: 139736

Shaw
Geotechnical Laboratory
Knoxville, TN
(865) 690-3211

SAMPLE NUMBER CROSS-REFERENCE LIST

Lab Sample ID	Client Sample ID	MATRIX
SEK 5495	B29HN9	SOIL

Appendix B
Data Results

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B29HN9

Project No. 139736.13100000

Lab Sample No. SEK 5495

Moisture Content = 17.0%

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	100.0%
	#10	2.000	100.0%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	99.1%
	#40	0.425	97.9%
	#60	0.250	96.0%
	#100	0.149	72.8%
	#140	0.106	47.7%
	#200	0.075	28.9%

0.0% Gravel

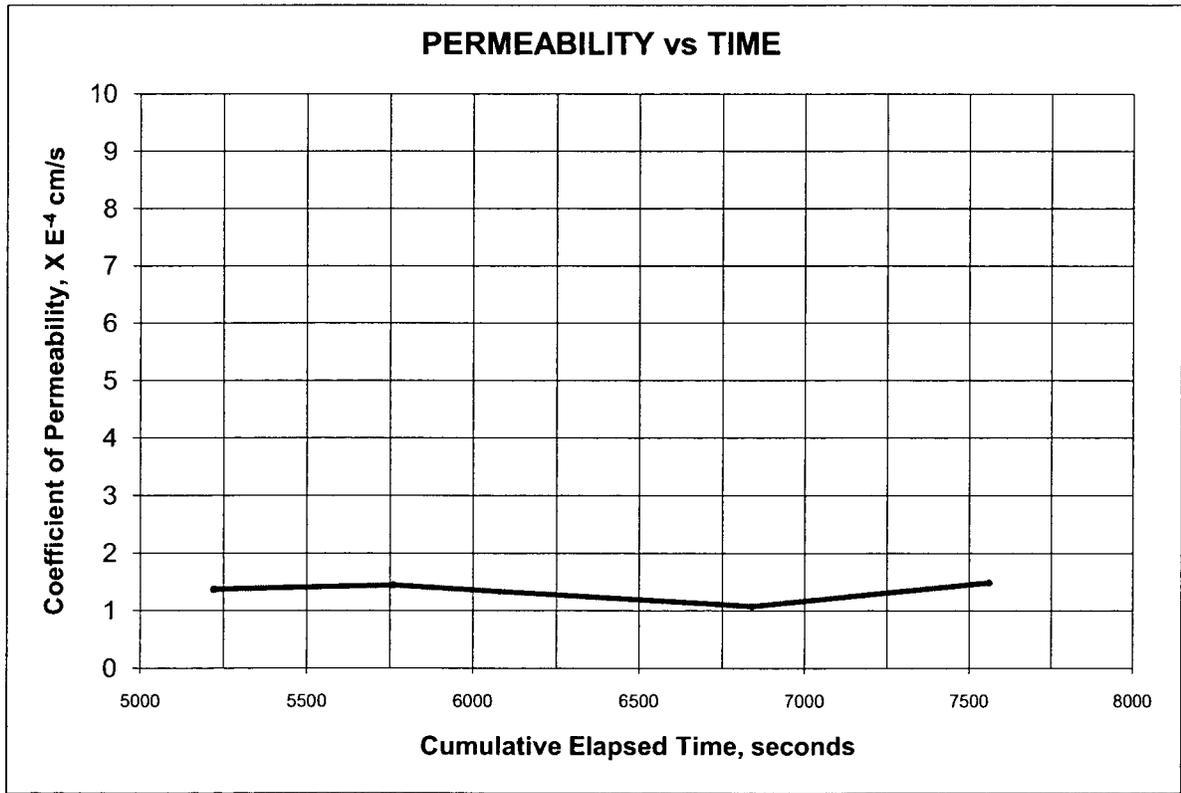
71.1% Sand

28.9% Silt/Clay

HYDRAULIC CONDUCTIVITY / PERMEABILITY
ASTM D 5084

PROJECT NAME: Eberline	CLIENT SAMPLE NO. B29HN9			
PROJECT NO. 139736.13100000	LAB SAMPLE NO. SEK 5495			
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px 10px;">INITIAL</td> <td style="padding: 2px 10px;">FINAL</td> </tr> </table>	INITIAL	FINAL	
INITIAL	FINAL			
Specimen diameter, cm	4.90			
Specimen length, cm	8.24	Hydraulic gradient		
Wet weight of specimen, g.	296.18	8.5		
Specimen cross-sect. area, cm ²	18.87	Min. consolidation stress, psi		
Water content, %	17.6	2.0		
Wet unit weight, pcf	118.9	Max. consolidation stress, psi		
Dry unit weight, pcf	101.1	3.0		
Est. degree of saturation, %	73.1	29.0		
Specific gravity of solids, assumed	2.65	73.1		
		Permeant Fluid		
		Deaired Tap Water		

Coefficient of Permeability, cm/s **1.3E-04**



Appendix C
Chain of Custody Records

COLLECTOR
 C7631 (199-H2-1); I-015
 Shaw Group

SAMPLING LOCATION
 100 Area Remedial Investigation/Feasibility Analysis - 100-HR-3 - Sediment

ICE CHEST NO.
 GWS-112

COMPANY CONTACT
 RADLOFF, AW
 376-4554

PROJECT DESIGNATION
 100 Area Remedial Investigation/Feasibility Analysis - 100-HR-3 - Sediment

FIELD LOGBOOK NO.
 HNF-N-491-15-107

ACTUAL SAMPLE DEPTH
 37.8-40.3 FT

OFFSITE PROPERTY NO.
 SEE PTR

PROJECT COORDINATOR
 RADLOFF, AW

SAF NO.
 F10-214

COA
 300110ES10

METHOD OF SHIPMENT
 FEDERAL EXPRESS

PRICE CODE
 8N

AIR QUALITY

Data Turnaround
 30 Days/30 Days

BILL OF LADING/AIR BILL NO.
 794456744472

MATRIX*
 A=Air
 DL=Drum
 L=Liquid
 O=Oil
 S=Soil
 SE=Sediment
 T=Tissue
 V=Vegetation
 W=Water
 WI=Wipe
 X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
 Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

PRESERVATION
 None

HOLDING TIME
 None

TYPE OF CONTAINER
 Liner

NO. OF CONTAINER(S)
 1

VOLUME
 1000mL

SAMPLE ANALYSIS
 SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SPECIAL HANDLING AND/OR STORAGE

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
11	SOIL	2/17/11	1035



CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
E. Christen	2/17/11 1130		SSU-121	2/17/11 1130
M0413 554 R1	2-23-11 0820		A-Turner AZ 2-23-11	0830
A-Turner AZ 2-23-11	1400		FEDEX	
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
 ** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
 (1) Bulk Density - D2937; Saturated Hydraulic Conductivity; Permeability - D2434; Particle Size (Dry Sieve) - D422;

LABORATORY SECTION
 RECEIVED BY: *Alphat Jones*

FINAL SAMPLE DISPOSITION
 RECEIVED BY: *SCIENTIST*
 DATE/TIME: 2-24-11 / 13:20