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RECEIVED OCTOBER 08, 2010



Shaw Environmental & Infrastructure, Inc.

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

CERTIFICATE OF ANALYSIS

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

October 7, 2010

This is the Certificate of Analysis for the following samples:

Shaw Project ID: Eberline Analytical
Shaw Project Number: 139736
Date Received by Lab: 09/02/2010
Number of Samples: One
Sample Type: Soil

I. Introduction/Case Narrative

One soil sample was received by the Shaw Geotechnical Laboratory on September 8, 2010. The sample was submitted for determination of bulk density (ASTM D 2937), moisture content (ASTM D 2216), and saturated hydraulic conductivity/ permeability (ASTM D 5084) as listed on the Chain of Custody/Sample Analysis Request. The sample number received was B26X21.

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

"I certify that this data package is in compliance 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**
Moisture Content of Soil and Rock..... **ASTM D 2216**
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.

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Report No.: EBER1010027
Mr. Michael Neely
Client: CH2M Hill Plateau Remediation Company
Shaw Project Name: Eberline Analytical
Shaw Project No.: 139736

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- 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

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Report No.: EBER1010027
Mr. Michael Neely
Client: CH2M Hill Plateau Remediation Company
Shaw Project Name: Eberline Analytical
Shaw Project No.: 139736

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SAMPLE NUMBER CROSS-REFERENCE LIST

Lab Sample ID	Client Sample ID	MATRIX
SEK 4945	B26X21	SOIL

Appendix B
Data Results

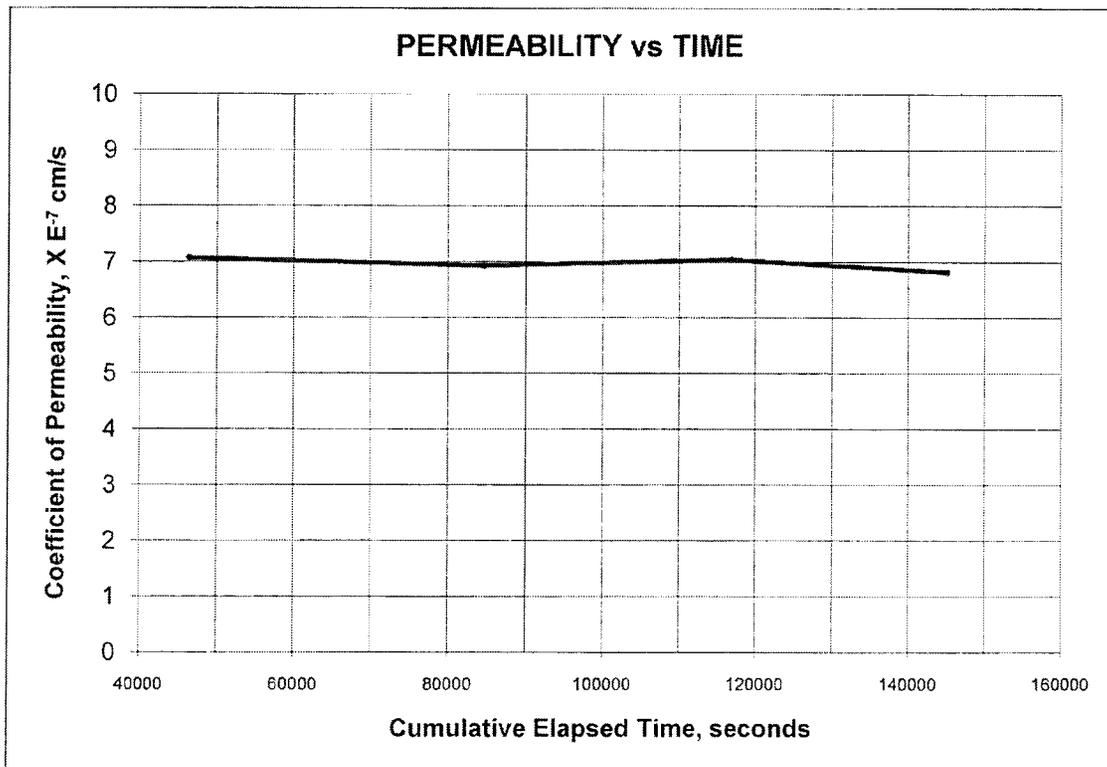
HYDRAULIC CONDUCTIVITY / PERMEABILITY
ASTM D 5084

PROJECT NAME: Eberline Analytical
 PROJECT NO. 139736.10000000

CLIENT SAMPLE NO. B26X21
 LAB SAMPLE NO. SEK 4945

	INITIAL	FINAL		
Specimen diameter, cm	4.94		Hydraulic gradient	27.8
Specimen length, cm	10.14		Min. consolidation stress, psi	2.0
Wet weight of specimen, g.	367.61		Max. consolidation stress, psi	6.0
Specimen cross-sect. area, cm ²	19.18		Total backpressure, psi	54.0
Water content, %	21.5		Permeant Fluid	Deaired DI Water
Wet unit weight, pcf	118.0			
Dry unit weight, pcf	97.1			
Est. degree of saturation, %	81.0	81.0		
Specific gravity of solids, assume	2.65			

Coefficient of Permeability, cm/s 7.0E-07



Appendix C
Chain of Custody Records

CH2MHill Plateau Remediation Company

COLLECTOR: *Mosley Nurseason*

SAMPLING LOCATION: C7689 (199-K-189); I-046

ICE CHEST NO.: *Cws-139-04*

SHIPPED TO: Shaw Group

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COMPANY CONTACT: DYKMAN, DL
TELEPHONE NO.: 373-2530

PROJECT DESIGNATION: 100 Area Remedial Investigation/Feasibility Analysis - 100-KR-4 Soils

FIELD LOGBOOK NO.: *HMF-N-5831*
ACTUAL SAMPLE DEPTH: *157.5 Yr*

OFFSITE PROPERTY NO.: SEE PTR

PROJECT COORDINATOR: DYKMAN, DL

SAF NO.: F10-207

COA: 30008ZES10

BILL OF LADING/AIR BILL NO.: *796219426309*

SEE PTR

F10-207-038

PRICE CODE: 8N

AIR QUALITY:

METHOD OF SHIPMENT: FEDERAL EXPRESS

PAGE 1 OF 1

DATA TURNAROUND: 45 Days / 45 Days

6 Lbs For Disposal

SEK 4945

None	None	None
None	None	None
Liner	Moisture Resistant Cont.	1
1	1	200g
1000g	200g	SEE ITEM (L) IN SPECIAL INSTRUCTIONS D2316.

PRESERVATION	SAMPLE DATE	SAMPLE TIME
HOLDING TIME	<i>9/2/10</i>	<i>1315</i>
TYPE OF CONTAINER		
NO. OF CONTAINER(S)		
VOLUME		
SAMPLE ANALYSIS		

POSSIBLE SAMPLE HAZARDS/REMARKS	SPECIAL HANDLING AND/OR STORAGE
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)	

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
<i>Shaw Group</i>	<i>9/2/10 1445</i>		<i>NO 413 3202</i>	<i>9/2/10 1445</i>
<i>SSUR 21</i>	<i>9-7-10 0800</i>		<i>Em Agw for em cyl</i>	<i>9-7-10 0800</i>
<i>Em Agw for em cyl</i>	<i>9-7-10 0810</i>		<i>FEDEX</i>	
			RECEIVED BY/STORED IN	DATE/TIME
			RECEIVED BY/STORED IN	DATE/TIME
			RECEIVED BY/STORED IN	DATE/TIME
			RECEIVED BY/STORED IN	DATE/TIME

LABORATORY SECTION: RECEIVED BY *Paul Abum*

FINAL SAMPLE DISPOSITION: DISPOSAL METHOD

SPECIAL INSTRUCTIONS: ** Physical Properties laboratory: Conduct the hydraulic conductivity test (ASTM 5084 or 2434) as appropriate to the sample matrix. (1) Bulk Density - D2937; Saturated Hydraulic Conductivity {Hydraulic Conductivity}; Permeability - D2434 {Hydraulic Conductivity};

TITLE: *R50*

DATE/TIME: *9-5-10 @ 1100*

DISPOSED BY: