

RECEIVED FEBRUARY 04, 2011



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

February 4, 2011

This is the Certificate of Analysis for the following samples:

Shaw Project ID: Eberline Analytical
Shaw Project Number: 139736
Date Received by Lab: 12/29/11
Number of Samples: One (1)
Sample Type: Soil

I. Introduction/Case Narrative

One (1) soil sample was received by the Shaw Geotechnical Laboratory on December 29, 2010. The sample was submitted for determination of bulk density, moisture content, and saturated hydraulic conductivity/ permeability as listed on the Chain of Custody/Sample Analysis Request. The sample number received was B29BN1.

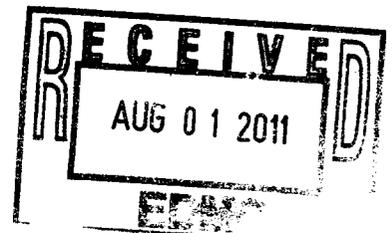
Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and Appendix C, Chain-of-Custody/Sample Receipt Records

"I certify that this data package is in compliance 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:

A handwritten signature in black ink, appearing to read "R. Gregory Bennett".

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 DensityASTM D 2937
Moisture Content of Soil and RockASTM 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.

- 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

Appendix A
Sample Cross-Reference List

Page 4 of 8
Report No.: EBER1210044
Mr. Michael Neely
Client: CH2M Hill Plateau Remediation Company
Shaw Project Name: Eberline Analytical
Shaw Project No.: 139736

Shaw
Geotechnical Laboratory
Knoxville, TN
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SAMPLE NUMBER CROSS-REFERENCE LIST

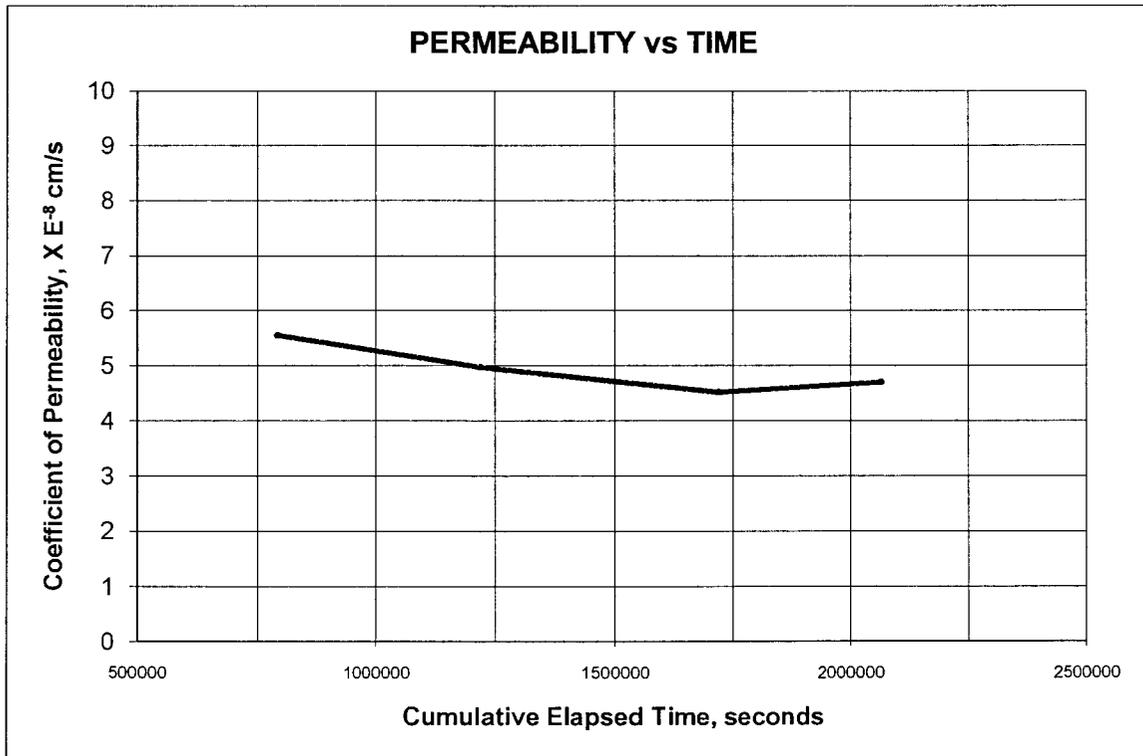
Lab Sample ID	Client Sample ID	MATRIX
SEK 5236	B29BN1	SOIL

Appendix B
Data Results

**HYDRAULIC CONDUCTIVITY / PERMEABILITY
 ASTM D 5084**

PROJECT NAME:	Eberline	CLIENT SAMPLE NO.	B29BN1
PROJECT NO.	139736.11100000	LAB SAMPLE NO.	SEK 5236
	INITIAL	FINAL	
Specimen diameter, cm	7.30		
Specimen length, cm	11.27	Hydraulic gradient	18.7
Wet weight of specimen, g.	977.01	Min. consolidation stress, psi	2.0
Specimen cross-sect. area, cm ²	41.87	Max. consolidation stress, psi	5.0
Water content, %	24.8	Total backpressure, psi	55.0
Wet unit weight, pcf	129.3		
Dry unit weight, pcf	103.6	Permeant Fluid	Deaired Tap Water
Est. degree of saturation, %	110.2	110.2	
Specific gravity of solids, assumed	2.65		

Coefficient of Permeability, cm/s 4.9E-08



Appendix C
Chain of Custody Records

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company
 COLLECTOR: *W. J. ...*
 SAMPLING LOCATION: C7695 (199-K-195); I-051
 ICE CHEST NO. *bus-227*

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

PROJECT COORDINATOR: RADLOFF, AW
 SAF NO.: F10-207
 COA: 300082ES10

PROJECT DESIGNATION: 100 Area Remedial Investigation/Feesibility Analysis - 100-KR-4 Soils
 FIELD LOGBOOK NO. *533-3/26*
 OFFSITE PROPERTY NO. *794266987215*

F10-207-101
 PRICE CODE: SN
 AIR QUALITY:
 METHOD OF SHIPMENT: FEDERAL EXPRESS

PAGE 1 OF 1
 Data Turnaround: 30 Days/30 Days

SHIPPED TO
 Shaw Group

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)

SPECIAL HANDLING AND/OR STORAGE

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

PRESERVATION: None
HOLDING TIME: None
TYPE OF CONTAINER: Liner
NO. OF CONTAINER(S): 1
VOLUME: 1000g
SAMPLE ANALYSIS: SEE ITEM (1) IN SPECIAL INSTRUCTIONS

DATE/TIME: 12/27/00 1405

SAMPLE NO.: B29BN1
MATRIX*: SOIL

SEK 5236

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
<i>W. J. ...</i>	12/27/00 0945		NO. 413 SSUM	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945
<i>W. J. ...</i>	12/27/00 0945		RECEIVED BY STORED IN	12/27/00 0945

SPECIAL INSTRUCTIONS
 ** The CACN for all analytical work at WSCF laboratory is 401697ES20.□.** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
 (1) Bulk Density - D2937; Saturated Hydraulic Conductivity {Hydraulic Conductivity}; Permeability - D2434 {Hydraulic Conductivity};

LABORATORY SECTION: RECEIVED BY *W. J. ...*
FINAL SAMPLE DISPOSITION: DISPOSAL METHOD *...*

TITLE: *...*
DISPOSED BY: *...*
DATE/TIME: 12/29/00 0112

ORIGINAL