



Shaw Environmental & Infrastructure, Inc.

RECEIVED APRIL 14, 2011

0098226
REVISION 1

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

EBER 0211066
KB 4-19-11

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

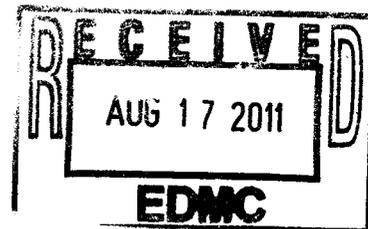
One (1) soil sample was received by the Shaw Geotechnical Laboratory on February 24, 2011. The samples were submitted for determination of bulk density, particle size, and hydraulic conductivity/permeability as listed on the Chain of Custody/Sample Analysis Request. The sample number for the received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



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

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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.

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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

SAMPLE ISSUE RESOLUTION

SIR NUM SDR11-190
REV NUM 0
DATE INITIATED 3/2/2011

SAMPLE EVENT INFORMATION

SAF NUM(S) F10-214
OPERABLE UNIT(S) 100-HR-3
PROJECT(S) 100 Area RI/FS
SAMPLE EVENT TITLE(S) 100 Area RI/FS
LABORATORY Shaw Group

SAMPLING INFORMATION

NUMBER OF SAMPLES 1
SAMPLE NUMBERS B29HN9
SAMPLE MATRIX SOIL
COLLECTION DATE 2/17/2011 - 2/17/2011
SDG NUM EBER0211066

ISSUE BACKGROUND

CLASS Laboratory Issue
TYPE Chain of Custody Issue

DESCRIPTION COC# F10-214-093; No reciever listed in "chain of possession box" of COC. Sample custodian signed in the laboratory section of the COC which is for sample disposal only.

DISPOSITION

DESCRIPTION Proposed Resolution: Correct COC and resubmit.

JUSTIFICATION Accepted Resolution: COC corrected and resubmitted. No further action required. SIR closed.
 Submitted by: Bryan Crisp 03/01/2011
 Accepted by: SHAW lab. 04/13/2011

After further review, we have decided to request that all future chains of custodies have the custodial signatures in the next open entry "Received by/Stored In" space in the "Chain of Possession" box to document receipt of all samples.

Appendix A
Sample Cross-Reference List

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Report No.: EBER0211066
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Shaw Project Name: Eberline Analytical
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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

Appendix C
Chain of Custody Records

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

CH2M Hill Plateau Remediation Company
 COLLECTOR: *Christina Ruzicka*
 BILLING: *Billings 1-4*

PROJECT COORDINATOR: RADLOFF, AW
 SAF NO.: FID-214
 COA: 300110ES10

TELEPHONE NO.: 376-4554
 PROJECT DESIGNATION: 100 Area Remedial Investigation/Feasibility Analysis - 100-HR-3 - Sediment
 FIELD LOGBOOK NO.: HNF-N-491-15 p. 37.8-40.3 FT
 ACTUAL SAMPLE DEPTH: 37.8-40.3 FT

PRICE CODE: 8N
 AIR QUALITY:
 DATA TURNAROUND: 30 Days/30 Days

FEDERAL EXPRESS: 794456744472

DATE: 2/17/11

COMPANY CONTACT: RADLOFF, AW	PROJECT COORDINATOR: RADLOFF, AW	SAF NO.: FID-214	COA: 300110ES10
PROJECT DESIGNATION: 100 Area Remedial Investigation/Feasibility Analysis - 100-HR-3 - Sediment	FIELD LOGBOOK NO.: HNF-N-491-15 p. 37.8-40.3 FT	ACTUAL SAMPLE DEPTH: 37.8-40.3 FT	
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 DATE: 2/17/11	SAMPLE TIME: 1035	
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)			
MATRIX*: A=Air, DL=Drum, L=Liquid, O=Oil, S=Soil, SF=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other	SAMPLE NO.: B29HNG	MATRIX*: SOIL	

SEK 5495

5.5 lbs

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CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
<i>E. Christen</i>	2/17/11 1130	SSU-121		2/17/11 1130
M0413 SS4 R1	2-23-11	A. Turner		0820
<i>A. Turner</i>	2-23-11	FEDEX		1400
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: *Allyson Carter*

FINAL SAMPLE DISPOSITION: RECEIVED BY: SCIENTIST

DATE/TIME: 2-24-11 / 13:20