



Shaw Environmental & Infrastructure, Inc.

RECEIVED APRIL 01, 2011

REVISION 0 ⁰⁰⁹⁸²²⁴

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

EBER 0111045

KB 4-11-11

CERTIFICATE OF ANALYSIS

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

April 1, 2011

This is the Revised Certificate of Analysis for the following samples:

Shaw Project ID: Eberline Analytical
Shaw Project Number: 139736
Date Received by Lab: 01/04/11
Number of Samples: Three (3)
Sample Type: Soil

I. Introduction/Case Narrative

This Certificate of Analysis was originally reported on January 21, 2011. The revision is to correct the sample delivery group number (SDG) found in the report header on pages 2-9.

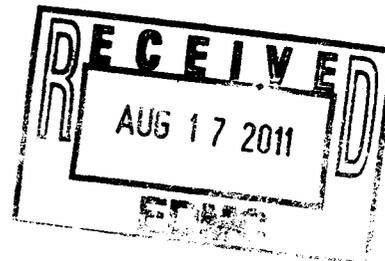
Three (3) soil samples were received by the Shaw Geotechnical Laboratory on January 4, 2011. The samples were submitted for determination of bulk density, moisture content, particle size, and saturated hydraulic conductivity/ permeability as listed on the Chain of Custody/Sample Analysis Request. The sample numbers received were B29FF0, B29FF3, and B29BN0.

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:

R. Gregory Bennett
Geotechnical Laboratory Manager, Technology Applications Group



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 Report No.: EBER0111045 REVISED
 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

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
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 heterogeneous 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

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Report No.: EBER0111045 REVISED
Mr. Michael Neely
Client: CH2M Hill Plateau Remediation Company
Shaw Project Name: Eberline Analytical
Shaw Project No.: 139736

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

SAMPLE NUMBER CROSS-REFERENCE LIST

Lab Sample ID	Client Sample ID	MATRIX
SEK 5240	B29FF0	SOIL
SEK 5241	B29FF3	SOIL
SEK 5242	B29BN0	SOIL

**Appendix B
Data Results**

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B29FF0

Project No. 139736.11200000

Lab Sample No. SEK 5240

Moisture Content = 19.1%

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	91.4%
	0.75"	19.000	81.1%
	0.375"	9.500	70.8%
	#4	4.750	68.0%
	#10	2.000	64.0%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	55.5%
	#40	0.425	43.8%
	#60	0.250	19.0%
	#100	0.149	9.5%
	#140	0.106	7.8%
	#200	0.075	6.9%

32.0% Gravel

61.1% Sand

6.9% Silt/Clay

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B29FF3

Project No. 139736.11200000

Lab Sample No. SEK 5241

Moisture Content = 19.8%

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	63.5%
	0.375"	9.500	53.2%
	#4	4.750	51.5%
	#10	2.000	49.9%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	45.4%
	#40	0.425	38.3%
	#60	0.250	26.3%
	#100	0.149	18.2%
	#140	0.106	15.9%
	#200	0.075	14.4%

48.5% Gravel

37.2% Sand

14.4% Silt/Clay

Appendix C
Chain of Custody Records

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-196-180	PAGE 1 OF 1
COLLECTOR <i>Rebecca Best-Kearse Higueras</i>	COMPANY CONTACT RADLOFF, AW	TELEPHONE NO. 376-4554	PROJECT COORDINATOR RADLOFF, AW	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7658 (399-6-3); I-020	PROJECT DESIGNATION 300 Area Remedial Investigation/Feasibility Analysis - 300-FF-5 Soils	FIELD LOGBOOK NO. <i>NAF-N-503-2-19 82</i>	SAF NO. F10-196	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT FEDERAL EXPRESS
ICE CHEST NO. <i>CWS-219</i>	OFFSITE PROPERTY NO. SEE PTR	ACTUAL SAMPLE DEPTH <i>84.3-86.8</i>	COA 300206ES10	BILL OF LADING/AIR BILL NO. <i>794281615181</i>	
SHIPPED TO Shaw Group	SEE PTR				

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
SPECIAL HANDLING AND/OR STORAGE	VOLUME	1000g
	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

Disposal weight: 2441g

SEK 5240

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>Larry Ramez Tony Ramez 12-28-10</i>	DATE/TIME 12-28-10	RECEIVED BY/STORED IN SSU-RI	DATE/TIME DEC 28 2010	** The 300 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. (1) Bulk Density - D2937; Particle Size (Dry Sieve) - D422;	
RELINQUISHED BY/REMOVED FROM SSU-RI	DATE/TIME 1-3-11	RECEIVED BY/STORED IN <i>M.A. White M. White</i>	DATE/TIME 0930	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> ORIGINAL </div>	
RELINQUISHED BY/REMOVED FROM <i>M.A. White M. White</i>	DATE/TIME 1-3-11	RECEIVED BY/STORED IN FEDEX	DATE/TIME 0930		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN <i>[Signature]</i>	DATE/TIME 1/4/11		
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		
LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME		
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME		

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F10-196-184	PAGE 1 OF 1
COLLECTOR <i>Reserve Rest Kauer Hiyuna</i>	COMPANY CONTACT RADLOFF, AW	TELEPHONE NO. 376-4554	PROJECT COORDINATOR RADLOFF, AW	PRICE CODE 8N	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION C7658 (399-6-3); 1-021	PROJECT DESIGNATION 300 Area Remedial Investigation/Feasibility Analysis - 300-FF-5 Soils	FIELD LOGBOOK NO. <i>HW-N-503-2-A 81</i>	SAF NO. F10-196	AIR QUALITY <input type="checkbox"/>	METHOD OF SHIPMENT GOVERNMENT VEHICLE
ICE CHEST NO. <i>CWS-219</i>	OFFSITE PROPERTY NO. N/A	ACTUAL SAMPLE DEPTH <i>70.0 - 72.5</i>	COA 300206ES10	BILL OF LADING/AIR BILL NO. N/A	7942816 15181

MATRIX* A=Air DL=Drum L=Liquid DS=Drum 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 1000g	SAMPLE ANALYSIS SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SPECIAL HANDLING AND/OR STORAGE	SAMPLE DATE <i>12-27-10</i>	SAMPLE TIME <i>1:27</i>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">SEK 5241</div>				

Disposal weight: 2315g

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM <i>Larry Reserve Jimmy Reserve 12-27-10</i>	DATE/TIME 1600	RECEIVED BY/STORED IN <i>MD-744 SSU-R3 12-27-10</i>	DATE/TIME 1600	** The 300 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.	
RELINQUISHED BY/REMOVED FROM <i>SSU-R3</i>	DATE/TIME DEC 28 2010 13:00	RECEIVED BY/STORED IN <i>DW Brotherton</i>	DATE/TIME DEC 28 2010 13:00	(1) Bulk Density - D2937; Particle Size (Dry Sieve) - D422;	
RELINQUISHED BY/REMOVED FROM <i>DW Brotherton</i>	DATE/TIME DEC 28 2010 14:00	RECEIVED BY/STORED IN <i>SSU-RI</i>	DATE/TIME DEC 28 2010 14:00	23 OPEN	
RELINQUISHED BY/REMOVED FROM <i>SSU-RI 1-3-11</i>	DATE/TIME 0930	RECEIVED BY/STORED IN <i>M. A. White Malabar 1-3-11</i>	DATE/TIME 0930		
RELINQUISHED BY/REMOVED FROM <i>M. A. White Malabar 1-3-11</i>	DATE/TIME 1400	RECEIVED BY/STORED IN <i>FEDEX</i>	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN <i>FEDEX</i>	DATE/TIME		
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN <i>gourner</i>	DATE/TIME 1/4/11 10:10		
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME	

CH2M Hill Plateau Remediation Company

COLLECTOR: D. Webb

SAMPLING LOCATION: C7695 (199-K-195); I-050

ICE CHEST NO.: CWS-219

SHIPPED TO: Shaw Group

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

PROJECT COORDINATOR: RADLOFF, AW

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

FIELD LOGBOOK NO.: HNF-N-583-3/25
ACTUAL SAMPLE DEPTH: 203.0'-205.5'

OFFSITE PROPERTY NO.: SEE PTR

SAF NO.: F10-207

PRICE CODE: 8N

AIR QUALITY:

METHOD OF SHIPMENT: FEDERAL EXPRESS

BILL OF LADING/AIR BILL NO.: 794281615181

PAGE 1 OF 1

Data Turnaround: 30 Days/30 Days

PRESERVATION	None	None	None
HOLDING TIME	None	None	None
TYPE OF CONTAINER	Liner	Moisture Resistant Cont.	1
NO. OF CONTAINER(S)	1	1000g	200g
VOLUME	1000g	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Moisture Content - D2216;
SAMPLE ANALYSIS			
SAMPLE DATE	12-21-10	SAMPLE TIME	1315
			X
			X

Disposal weight: 2921g

SEK 5242

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CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
D. Webb / D.W. Webb	12-21-10 / 1450		Mo 413 554-24	12-21-10 / 1450
SSUBA	0930		M. A. White	0930
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
M. A. White	13-11		FEDEX	
RELINQUISHED BY/REMOVED FROM	DATE/TIME		RECEIVED BY/STORED IN	DATE/TIME
M. A. White	13-11		1/4/11	10:10
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 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};

ORIGINAL

LABORATORY SECTION: RECEIVED BY

FINAL SAMPLE DISPOSITION: DISPOSAL METHOD

TITLE:

DISPOSED BY:

DATE/TIME: