



Shaw Environmental & Infrastructure, Inc.

RECEIVED MARCH 25, 2011

1214718

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

EBER0211067

KB

3-29-11

CERTIFICATE OF ANALYSIS

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

March 25, 2011

This is the Certificate of Analysis for the following samples:

Shaw Project ID: Eberline Analytical
Shaw Project Number: 139736
Date Received by Lab: 02/28/2011
Number of Samples: Four (4)
Sample Type: Soil

I. Introduction/Case Narrative

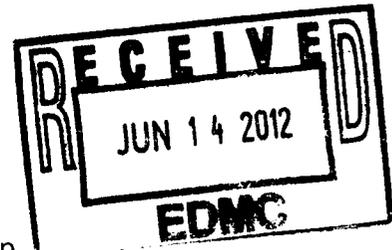
Four (4) soil samples were received by the Shaw Geotechnical Laboratory on February 28, 2011. The samples were submitted for determination of bulk density and particle size as listed on the Chain of Custody/Sample Analysis Requests. The sample numbers for the received samples were B2BBD2, B2BBD3, B296R4, and B296R5.

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**

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

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Report No.: EBER0211067
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 5496	B2BBD2	SOIL
SEK 5497	B2BBD3	SOIL
SEK 5498	B296R4	SOIL
SEK 5499	B296R5	SOIL

Appendix B
Data Results

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B2BBD2

Project No. 139736.13200000

Lab Sample No. SEK 5496

Moisture Content = 19.0%

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	99.1%
	#10	2.000	96.2%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	90.0%
	#40	0.425	81.2%
	#60	0.250	60.5%
	#100	0.149	33.4%
	#140	0.106	26.0%
	#200	0.075	21.0%

0.9% Gravel

78.1% Sand

21.0% Silt/Clay

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberine

Field Sample No. B2BBD3

Project No. 139736.13200000

Lab Sample No. SEK 5497

Moisture Content = 29.7%

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	99.9%
	#10	2.000	99.6%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	98.5%
	#40	0.425	94.5%
	#60	0.250	67.4%
	#100	0.149	31.7%
	#140	0.106	24.3%
	#200	0.075	19.7%

0.1% Gravel

80.2% Sand

19.7% Silt/Clay

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B296R4

Project No. 139736.13200000

Lab Sample No. SEK 5498

Moisture Content = 6.9%

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	88.0%
	0.75"	19.000	62.1%
	0.375"	9.500	43.3%
	#4	4.750	31.5%
	#10	2.000	20.5%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	11.2%
	#40	0.425	5.6%
	#60	0.250	3.8%
	#100	0.149	2.8%
	#140	0.106	2.4%
	#200	0.075	2.0%

68.5% Gravel

29.5% Sand

2.0% Silt/Clay

PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberine

Field Sample No. B296R5

Project No. 139736.13200000

Lab Sample No. SEK 5499

Moisture Content = 6.1%

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	78.7%
	0.375"	9.500	59.8%
	#4	4.750	43.1%
	#10	2.000	28.2%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	15.7%
	#40	0.425	7.0%
	#60	0.250	4.3%
	#100	0.149	3.0%
	#140	0.106	2.5%
	#200	0.075	2.1%

56.9% Gravel

41.0% Sand

2.1% Silt/Clay

Appendix C
Chain of Custody Records

CH2M Hill Plateau Remediation Company

COLLECTOR: *Roscoe Rust Higgins*

SAMPLING LOCATION: CR027 (399-1-62); I-008

ICE CHEST NO.: *GW-199*

SHIPPED TO: Shaw Group

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COMPANY CONTACT: RADLOFF, AW

TELEPHONE NO.: 376-4554

PROJECT COORDINATOR: RADLOFF, AW

PRICE CODE: 8H

DATA TURNAROUND: 30 Days / 30 Days

PROJECT DESIGNATION: 300 Area Remedial Investigation/Feasibility Analysis - 300-FF-5 Soils

FIELD LOGBOOK NO.: *HVF-N-503-2 pg 98*

ACTUAL SAMPLE DEPTH: *31.8 - 34.3*

SAF NO.: F10-196

COA: 300206ES10

METHOD OF SHIPMENT: FEDERAL EXPRESS

BILL OF LADING/AIR BILL NO.: SEE PTR *796805375040*

PRESERVATION: None

HOLDING TIME: None

TYPE OF CONTAINER: Liner

NO. OF CONTAINER(S): 1

VOLUME: 1000g

SAMPLE ANALYSIS: SEE ITEM (I) IN SPECIAL INSTRUCTIONS

SAMPLE DATE: *2-24-11*

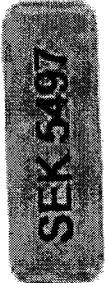
SAMPLE TIME: *1340*

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*: *SOIL*

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CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
<i>Larry Roscoe Rust Higgins</i>	<i>2-24-11 1440</i>		<i>M. White</i>	<i>2-24-11 1440</i>
<i>M. White</i>	<i>2-24-11 1530</i>		<i>SSU-RI</i>	<i>2-24-11 1530</i>
<i>SSU-RI</i>	<i>2-25-11-0715</i>		<i>ST. M. [unclear]</i>	<i>2-25-11-0715</i>
<i>ST. M. [unclear]</i>	<i>2-25-11-1400</i>		FEDEX	<i>2-25-11-1400</i>

SPECIAL INSTRUCTIONS: ** 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;

LABORATORY SECTION: *R50*

FINAL SAMPLE DISPOSITION: *R50*

RECEIVED BY: *Paul [unclear]*

DISPOSAL METHOD:

DATE/TIME: *2-28-11 1800*

DATE/TIME:

CH2M Hill Plateau Remediation Company

COLLECTOR: *Aguilar, Becan, Wallace*

SAMPLING LOCATION: C8026 (399-1-61); I-007

ICE CHEST NO. *SP-199*

SHIPPED TO: Shaw Group

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

COMPANY CONTACT: RADLOFF, AW

TELEPHONE NO.: 376-4554

PROJECT COORDINATOR: RADLOFF, AW

PRICE CODE: 8N

DATA TURNAROUND: 45 Days / 45 Days

PROJECT DESIGNATION: 300 Area Remedial Investigation/Feasibility Analysis - 300-FF-5 Soils

FIELD LOGBOOK NO. *HNF-A-491-13/Pg 18*

ACTUAL SAMPLE DEPTH: *40.2 - 42.7*

METHOD OF SHIPMENT: FEDERAL EXPRESS

OFFSITE PROPERTY NO. *SEE PTR*

BILL OF LADING/AIR BILL NO. *796805375040*

SAF NO. F10-196

COA: 300206ES10

SEE PTR: *7 165*

SEK 5498

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

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
15	SOIL	2-24-11	1249

CH2M Hill Plateau Remediation Company

CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/PRINT NAMES	RECEIVED BY/STORED IN	DATE/TIME
<i>um Aguilar, Becan, Wallace</i>	2-24-11 1430		<i>M. Aguilar</i>	2-24-11 1430
<i>M. Aguilar</i>	2-24-11 1530		<i>SSU-R1</i>	2-24-11 1530
<i>SSU-R1</i>	2-25-11 0715		<i>S. Aguilar</i>	2-25-11 0715
<i>S. Aguilar</i>	2-25-11-1400		FEDEX	2-25-11-1400

SPECIAL INSTRUCTIONS

** 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;

LABORATORY SECTION: *SP-199*

RECEIVED BY: *SP-199*

DISPOSAL METHOD: *R50*

DATE/TIME: *2-25-11 @ 1000*

DISPOSED BY:

COLLECTOR
Aguilar Becerra, Wallace

SAMPLING LOCATION
C8026 (399-1-61); 1-008

ICE CHEST NO.
EWS-99

SHIPPED TO
Shaw Group

COMPANY CONTACT
RADLOFF, AW

TELEPHONE NO.
376-4554

PROJECT COORDINATOR
RADLOFF, AW

PRICE CODE
8N

DATA TURNAROUND
45 Days / 45 Days

PROJECT DESIGNATION
300 Area Remedial Investigation/Feasibility Analysis - 300-FF-5 Soils

FIELD LOGBOOK NO.
HNF-N-491-13 / Pg 18 42.7 - 45.2

ACTUAL SAMPLE DEPTH
18 42.7 - 45.2

SAF NO.
F10-196

AIR QUALITY

METHOD OF SHIPMENT
FEDERAL EXPRESS

COA
300206ES10

BILL OF LADING/AIR BILL NO.
SEE PTR 796805375040

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

SPECIAL HANDLING AND/OR STORAGE
SEE ITEM (1) IN SPECIAL INSTRUCTIONS

16	SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	DATE/TIME	DATE/TIME
09	96R5	SOIL	2-24-11	1340	2-24-11	1530



CHAIN OF POSSESSION

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Christine Aguilar Becerra	2-24-11 1430	Matthews	2-24-11 1430
Matthews	2-24-11 1530	SSA-RI	2-24-11 1530
SSU-RI	2-25-11 0745	J. Matthews	2-25-11 0745
J. Matthews	2-25-11 1400	FEDEX	2-25-11 1400

SPECIAL INSTRUCTIONS
** 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;

LABORATORY SECTION
RECEIVED BY: *[Signature]*

FINAL SAMPLE DISPOSITION
DISPOSAL METHOD: *[Signature]*

TITLE
R50

DATE/TIME
2-24-11 13:00

DATE/TIME
2-25-11 13:00