



Geotechnical Laboratory
PO Box 4339
1570 Bear Creek Road
Oak Ridge TN 37830
(865) 482-6497

CERTIFICATE OF ANALYSIS

Stephen Trent
Fluor Hanford, Inc.
825 Jadwin Avenue
Richland, Washington 99352

February 1, 2005

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.45000000
Client Sample Data Group:	H2908
Date Received by Lab:	December 22, 2004
Number of Samples:	One (1)
Sample Type:	Soil

I. Introduction/Case Narrative

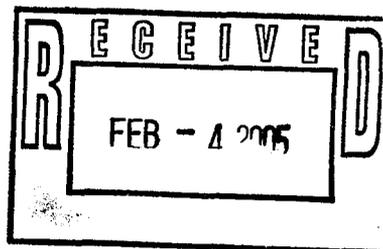
One soil sample was received by the Shaw Geotechnical Laboratory on December 22, 2004. The sample was submitted for determination of moisture content, bulk density, and sieve analysis. The sample number received was B1B5H1.

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:

Ralph Cole
Laboratory Manager, Geotechnical Services



00000001

II. Analytical Results/Methodology

REFERENCES: 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)*, 2004. Shaw Environmental and infrastructure, Standard Operating Procedures.

Moisture Content of Soil and Rock..... **ASTM D 2216**
Particle-size Analysis of Soils **ASTM D 422**
Bulk Density of Soils **EM 1110-2-1906**

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 certified by the National Institute for Certification of Engineering Technicians (NICET) in geotechnical soil testing, and 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

000000004

Page 4 of 9
February 1, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.45000000
SDG No. H2908

**Shaw Geotechnical
Laboratory
Oak Ridge TN
(865) 482-6497**

SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
-----------------------	--------------------------	---------------

BC0512	B1B5H1	Soil
--------------	--------------	------

00000005

Appendix B
Sample Test Results

000000006

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B1B5H1

Project No. 100846.45000000

Lab Sample No. BC0512

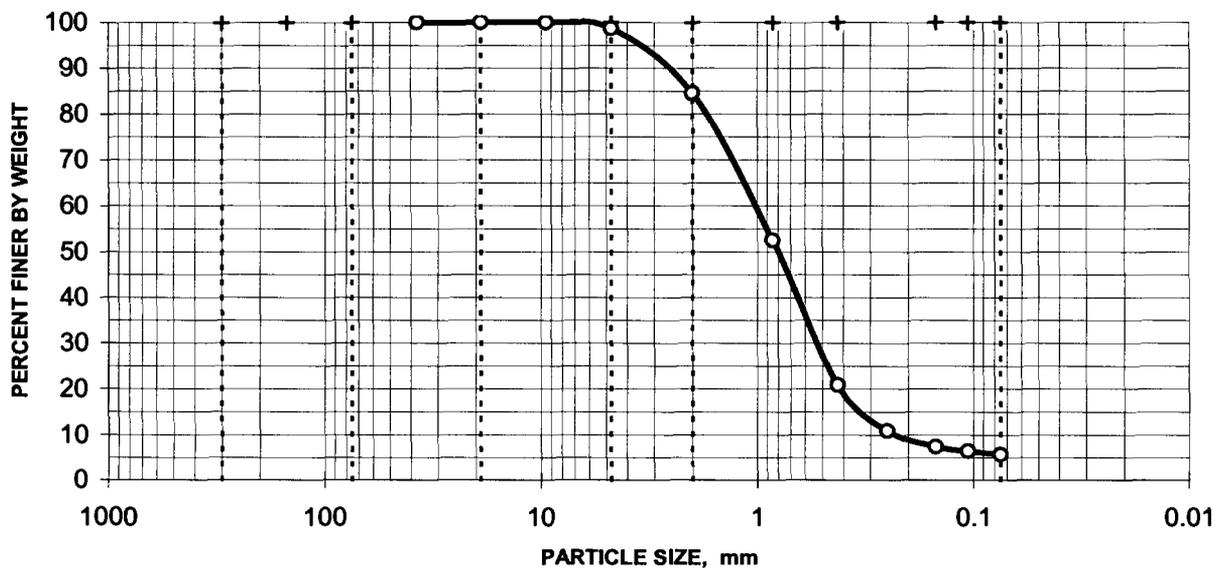
Moisture Content = 4.3%
 based on dry sample weight

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	98.7%
	#10	2.000	84.6%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	52.5%
	#40	0.425	20.9%
	#60	0.250	11.0%
	#100	0.149	7.4%
	#140	0.106	6.4%
	#200	0.075	5.7%

DISTRIBUTION CURVE



1.3% Gravel

93.0% Sand

5.7% Silt/Clay

00000008

Appendix C
Chain-of-Custody and Request-for-Analysis Records

00000010

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-006-314	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wiberg/Tyra		COMPANY CONTACT LC Hulstrom		TELEPHONE NO. 373-3928		PROJECT COORDINATOR TRENT, SJ	
SAMPLING LOCATION 200-PW2/216-S-7, 66-68.5 ft		PROJECT DESIGNATION 200-PW-2/200-PW-4 OU - Borehole Soil Sampling				PRICE CODE 8N	
ICE CHEST NO. GKP-03-019		FIELD LOGBOOK NO.		COA 119153E510		AIR QUALITY <input type="checkbox"/>	
SHIPPED TO Shaw Group		OFFSITE PROPERTY NO. 2u PTR 14590				BILL OF LADING/AIR BILL NO. 2u PTR 14590	
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS SDG# H2908	PRESERVATION		None	None		
		TYPE OF CONTAINER		Moisture Resistant Cont	Split Spoon Liner		
		NO. OF CONTAINER(S)		1	1		
	SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B1B588		VOLUME		200g	1000g	
SAMPLE ANALYSIS		Moisture Content - D2216;		Particle Size (Dry Sieve) - D422;			
				BDK Density - 02937			
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B1B5H1	SOIL	11/24/04	0955	X	X		
BC 0512							
CHAIN OF POSSESSION				SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME	
Dana W. ...		11/24/04		Site Frise		11/30/04	
S7 Site Frise		12/18/04 1300		Kwan Hughes		12/13/04 1300	
M.H. ...		12/15/04 0940		M.H. ...		12/15/04 0940	
M.H. ...		12/16/04 0940		M.H. ...		12/16/04 0940	
M.H. ...		12/13/04 1400		M.H. ...		12/13/04 1400	
Fred ...		12/16/04 9:40		Fred ...		12/16/04 12:45	
Fred ...		12/21/04 3:00		Fred ...		12/21/04	
LABORATORY SECTION	RECEIVED BY	DATE/TIME		TITLE		DATE/TIME	
	Rehul ...	12/22/04 @ 1120		SHAW			
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME			

000000011

DASH SAMPLE IDENTIFICATION STORED TESTS
 01A-W B1B5H1 SHAW | DISPOS E331S E333S E335S
 =====

BC 0512

<u>RELEASED BY</u>	<u>DATE</u>	<u>TRANSFERRED TO</u>	<u>DATE</u>	<u>RECEIVED BY</u>	<u>DATE</u>
<i>J. Sams</i>	<i>12/21/04</i>	<i>Shaw</i>	<i>12/21/04</i>	<i>[Signature]</i>	<i>12/22/04</i>