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Geotechnical Laboratory
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 865/482-6497

CERTIFICATE OF ANALYSIS

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

November 3, 2004

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.22000000
Client Sampling Authorization Form No.	F03-025
Client Sample Data Group:	H2720
Date Received by Lab:	September 20, 2004
Number of Samples:	Two (2)
Sample Type:	Soil

I. Introduction/Case Narrative

Two soil samples were received by the Shaw Geotechnical Laboratory on September 20, 2004. Samples were submitted for determination of bulk density and sieve analysis. The sample numbers received were B19445 and B19446.

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

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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
Bulk Density of Soils.....	EM 1110-2-1906
Particle-size Analysis of Soils	ASTM D 422
Calcium Carbonate Content.....	ASTM D 4373
Specific Gravity of Soil.....	ASTM D 854

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

3000004

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November 3, 2004
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.22000000
SAF No. F03-25
SDG No. H2720

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

SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
BC0448	B19445	Soil
BC0449	B19446	Soil

0000005

Appendix B
Sample Test Results

8888886

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name **Eberline Hanford**
 Project No. **100846.22000000**

Field Sample No. **B19445**
 Lab Sample No. **BC0448**

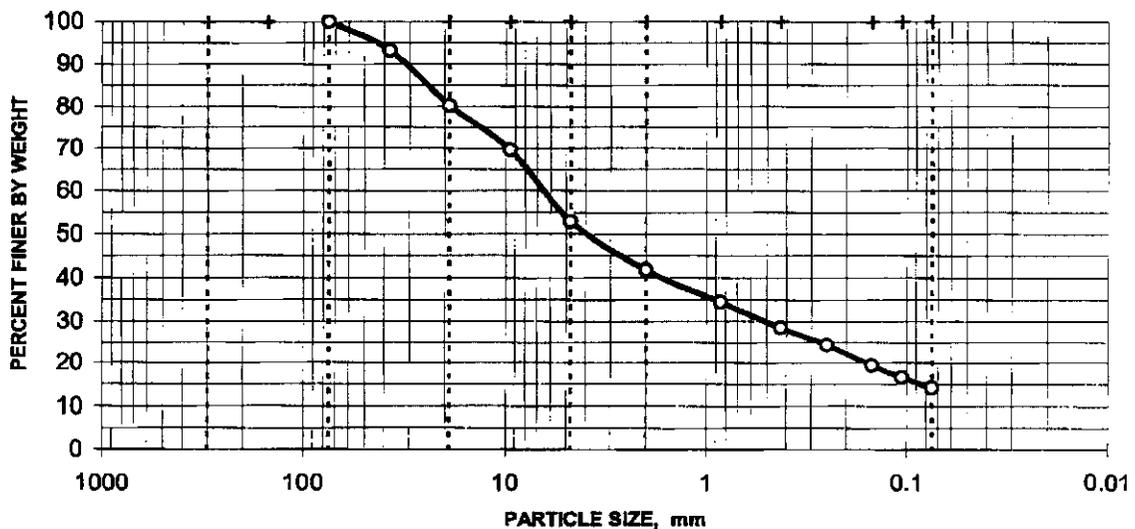
Moisture Content = **4.6%**
 based on dry sample weight

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	93.2%
	0.75"	19.000	80.3%
	0.375"	9.500	69.6%
	#4	4.750	53.0%
	#10	2.000	41.8%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	34.5%
	#40	0.425	28.5%
	#60	0.250	24.4%
	#100	0.149	19.4%
	#140	0.106	16.6%
	#200	0.075	14.1%

DISTRIBUTION CURVE



47.0% Gravel

38.8% Sand

14.1% Silt/Clay

0000008

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford
 Project No. 100846.22000000

Field Sample No. B19446
 Lab Sample No. BC0449

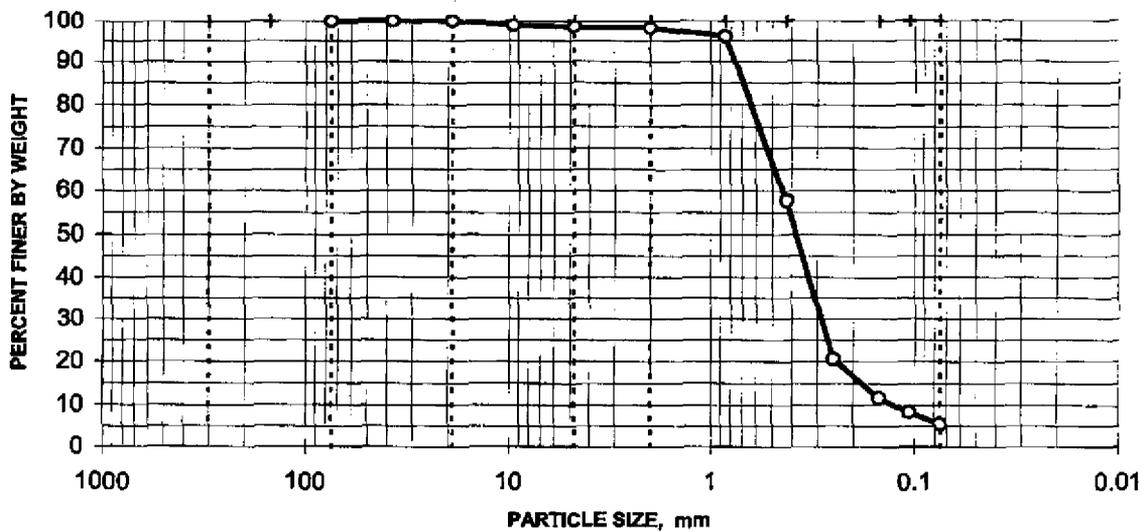
Moisture Content = 3.7%
 based on dry sample weight

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	98.9%
	#4	4.750	98.5%
	#10	2.000	98.1%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	96.0%
	#40	0.425	57.7%
	#60	0.250	20.6%
	#100	0.149	11.7%
	#140	0.106	8.4%
	#200	0.075	5.4%

DISTRIBUTION CURVE



1.5% Gravel 93.0% Sand 5.4% Silt/Clay

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

0000010

DASH	SAMPLE IDENTIFICATION	STORED	TESTS	
01A-S	B19445	SHAW	DISPOS E331S E333S E335S	BC 0448
*****				****
02A-S	B19446	SHAW	DISPOS E331S E333S E335S	BC 0449
=====				=====

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<i>Just Jones</i>	<i>9/17/04</i>	<i>Shaw</i>		<i>Just Jones</i>	<i>9.20.04</i>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-165	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Hughes/Wlberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ		PRICE CODE BN
SAMPLING LOCATION 216-S-20, 202A-204.50 1915'-194' 15" E 44'		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil			SAF NO. F03-025	AIR QUALITY <input type="checkbox"/>	
ICE CHEST NO. GPP-03-021		FIELD LOGBOOK NO. HNF-N-356 1	COA 119143E510		METHOD OF SHIPMENT Federal Express		
SHIPPED TO Shaw Group		OFFSITE PROPERTY NO. See PTR 14113			BILL OF LADING/AIR BILL NO. See PTR 14113		
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 N/A DT 9/13/04 Tie to Rad Screen B191148	PRESERVATION	None	None			
		TYPE OF CONTAINER	Moisture Resistant Cont	Liner			
		NO. OF CONTAINER(S)	1	1			
		VOLUME	200mL	1000mL			
SPECIAL HANDLING AND/OR STORAGE N/A SDG 42720		SAMPLE ANALYSIS		Moisture Content - 02216	SEE ITEM (*) IN SPECIAL INSTRUCTIONS		
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B19445	SOIL	9-8-04	1115	X	X	BC 0448	
CHAIN OF POSSESSION				SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	(1) Particle Size (Dry Sieve) - D422; Bulk Density - D2937;			
R. PCISTER/Qualpro	9/8/04 1340	MO-026 F016#1	9/8/04 1340				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
MO-026 Frig #1	9/13/04 1130	Greg Thomas & Greg Thomas	9/13/04 1130				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
Greg Thomas & Greg Thomas	9/13/04 1130	Fed Ex					
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
Fed Ex	9/17/04 9:15	Fred Davis	9/17/04 11200				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
Fred Davis	9/17/04 7:00	Fed Ex	9/17/04				
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME				
		Fred Davis	9-20-04 1000				
LABORATORY SECTION	RECEIVED BY	TITLE		DATE/TIME			
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY		DATE/TIME			

0000012

FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-166	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ	
SAMPLING LOCATION 216-S-20; 220A-322-52 238'-240.5'		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil		SAF NO. F03-025		PRICE CODE 8N DATA TURNAROUND 45 Days / 45 Days	
ICE CHEST NO. GPP-03-021 18-9-7-04		FIELD LOGBOOK NO. HNF-N-356 1		COA 119143ES10		METHOD OF SHIPMENT Federal Express	
SHIPPEO TO Shaw Group		OFFSITE PROPERTY NO. See PTR 14113				BILL OF LADING/AIR BILL NO. See PTR 14113	
MATRIX* A=Air DL=Drum U=Ugids 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 NA DT 9/13/04 Tic to Rad Screen B191HB		PRESERVATION None None				
			TYPE OF CONTAINER Moisture Resistant Cont Liner				
			NO. OF CONTAINER(S) 1 1				
			VOLUME 200mL 1000mL				
SPECIAL HANDLING AND/OR STORAGE NA SDG # 42720		SAMPLE ANALYSIS		Moisture Content - D2216; SEE ITEM (1) IN SPECIAL INSTRUCTIONS 2290g			
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	BC 0449			
B19446	SOIL	9-13-04	07:5	X	X		
CHAIN OF POSSESSION		SIGN/ PRINT NAMES				SPECIAL INSTRUCTIONS	
RELINQUISHED BY/REMOVED FROM JSP/PS/Wiberg		DATE/TIME 9-13-04 1040		RECEIVED BY/STORED IN MO-026/Gi-50 #1		DATE/TIME 9-13-04 1040	
RELINQUISHED BY/REMOVED FROM MO-026/Fridge #1		DATE/TIME 9/13/04 1130		RECEIVED BY/STORED IN Greg Thomas / Greg Thomas		DATE/TIME 9/13/04 1130	
RELINQUISHED BY/REMOVED FROM Greg Thomas / Greg Thomas		DATE/TIME 9/13/04 1130		RECEIVED BY/STORED IN Fed Ex		DATE/TIME	
RELINQUISHED BY/REMOVED FROM Fed Ex		DATE/TIME 9/14/04 9:15		RECEIVED BY/STORED IN Fed Ex		DATE/TIME 9/14/04 16:00	
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN Paul Olsen		DATE/TIME 9-20-04 1000	
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	

C100000