

0061917



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

**CERTIFICATE OF ANALYSIS**

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

January 19, 2003

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.04000000
Client Sampling Authorization Form No.:	E03-020
Client Sample Data Group:	H2477
Date Received by Lab:	January 2, 2004
Number of Samples:	One (1)
Sample Type:	Soil



**I. Introduction/Case Narrative**

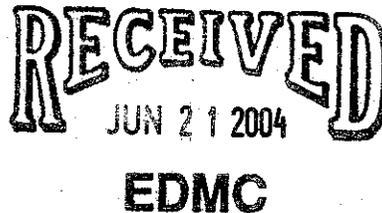
Two soil samples were received by the Shaw Geotechnical Laboratory on January 2, 2004. Each sample was designated for a separate sample data group (SDG). Samples were submitted for determination of particle-size distribution, bulk density and moisture content. The sample numbers received were B17RY4 and B183N3.

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



0000001

## 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)*, 2003. Shaw Environmental and infrastructure, Standard Operating Procedures.

Particle-Size Distribution of Soils .....	ASTM D 422
Moisture Content of Soil and Rock.....	ASTM D 2216
Bulk Density.....	ASTM D 2937
	USCAE 1110-2-0906

## 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

Two moisture content results are reported. One data page reports the moisture content of a sample aliquot submitted for "moisture content" determination. The second moisture result is reported on the grainsize and density report sheets, and was determined using excess material from those test specimens.

The bulk density test method requested was ASTM D 2937, Density of Soil In-Place by the Drive-Cylinder Method. This method covers field procedures used to procure undisturbed, near-surface soil samples, as well as analysis for bulk density. The data results presented here were derived from laboratory tests performed on client-supplied core (tube) samples. Shaw Environmental was not involved in sampling activities.

0000003

**Appendix A**  
**Sample Cross-Reference List**

0000004

Page 4 of 15  
January 19, 2004  
Steven Trent  
Fluor Hanford, Inc.  
Shaw Project Name: Eberline Hanford  
Shaw Project No. 100846.04000000  
SAF No. F03-020  
SDG No. H2477

**Shaw Geotechnical  
Laboratory  
Oak Ridge TN  
865/482-6497**

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**SAMPLE NUMBER CROSS-REFERENCE LIST**

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<b>LAB SAMPLE NO.</b>	<b>CLIENT SAMPLE NO.</b>	<b>MATRIX</b>
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BC0254 .....	B183N3 .....	Soil
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0000005

**Appendix B**  
**Sample Test Results**

0000006





**PARTICLE-SIZE ANALYSIS  
 ASTM D 422**

Project Name Eberline - Hanford

Client Sample No. B183N3

Project No. 100846.04000000

Lab Sample No. BC0254

Specific Gravity = 2.65  
 assumed for calculations

Moisture Content = 5.4%  
 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	100.0%
	#10	2.000	99.5%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	95.7%
	#40	0.425	71.2%
	#60	0.250	42.2%
	#100	0.149	19.3%
	#140	0.106	12.4%
	#200	0.075	9.0%

**HYDROMETER ANALYSIS**

H Y D R O M E T E R	Diameter mm	Percent Finer
	0.05034	8.5%
	0.03599	6.8%
	0.02292	6.0%
	0.01337	4.2%
	0.00956	3.0%
	0.00677	2.5%
	0.00444	2.1%
	0.00270	1.7%
	0.00138	1.3%

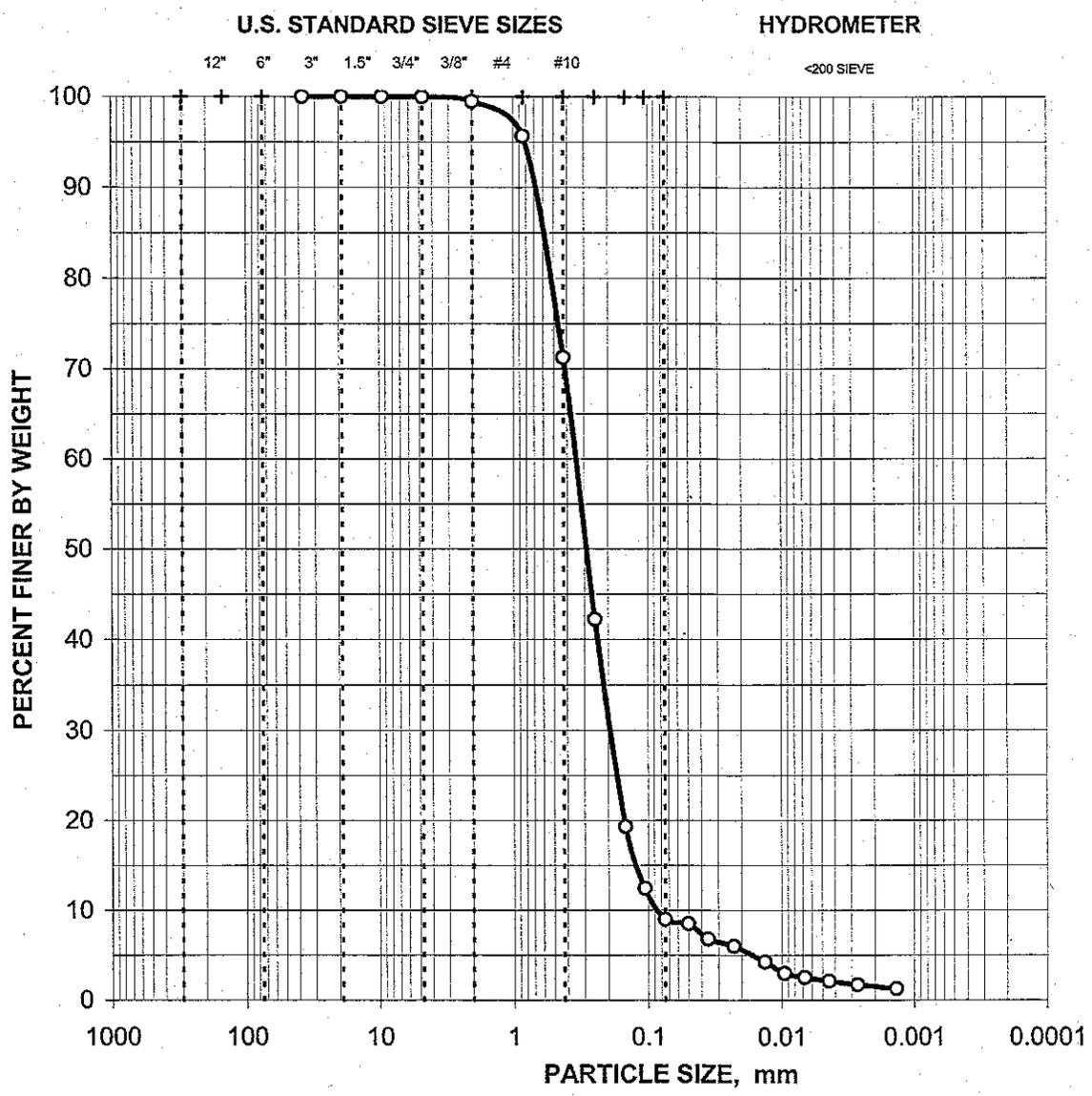
0.0% Gravel

91.0% Sand

9.0% Silt/Clay

0000009

**Eberline - Hanford**



CLIENT SAMPLE NO.: B183N3                      LAB SAMPLE NO.: BC0254

BOULDERS	COBBLES	GRAVEL					Silt/Clay
		COARSE	FINE	COARSE	MEDIUM	FINE	

0000010

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

0000011

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-020-021		Page 1 of 1			
Collector Pope/Hughes/Pfister		Company Contact Steve Trent		Telephone No. 373-5869		Project Coordinator TRENT, SJ		Price Code <sup>AK-141(6)</sup> 8N-8H 8DQ			
Project Designation 216-B-26 Characterization Sampling - Soil Sampling		Sampling Location C3245 (97.5-100 ft)		SAF No. F03-020		Air Quality <input type="checkbox"/>		Data Turnaround <sup>AK-141(6)</sup> 45 Days 2130 DAYS			
Ice Chest No. <b>GFP-03-027</b>		Field Logbook No. HNF-N-356-1		COA 119142ES10		Method of Shipment Federal Express		① mbb 12/30/03			
Shipped To Shaw Group		Offsite Property No. <b>See PTR</b>		Bill of Lading/Air Bill No. <b>See PTR</b>				2			
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation		None		None			
Special Handling and/or Storage				Type of Container		Moisture Resistant		Liner			
				No. of Container(s)		1		1			
				Volume		200g		1000g			
SAMPLE ANALYSIS				Moisture Content - D2216		Particle Size (Dry Sieve) - D422					
Sample No.		Matrix *	Sample Date	Sample Time							
B183N3		SOIL	12/17/03	12:19	X	X			BC 0254		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS		Matrix *	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				S=Soil	
J.S. Pope / A. Shaw		12/17/03 1630		MO-026 / fridge #2		12/17/03 1630				SB=Sediment	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				SO=Solid	
MO-026 Fridge #2		12/30/03 0945		Greg Thomas / Amy Thomas		12/30/03				SI=Sludge	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				W=Water	
Greg Thomas / Amy Thomas		12/30/03		Fed Ex						O=Oil	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				A=Air	
Fed Ex				Her [Signature]		12-31-03 1000				DS=Drum Solids	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				DL=Drum Liquids	
[Signature]		12-31-03 1600		D. Huskey SHAW E+I		1-5-04/0900				T=Tissue	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time				WI=Wipe	
										L=Liquid	
LABORATORY SECTION		Received By		Title		Date/Time				V=Vegetation	
		D. HUSKEY / SHAW E+I		SR. LAB TECH		1-5-04/0900				X=Other	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

12/31/03 11:28:03

WORK ID: SAF# F03-020 SDG H2477

RCVD: 12/31/03 DUE: 01/21/04

KEEP: 01/20/05 DISP: S

<u>DASH</u>	<u>SAMPLE IDENTIFICATION</u>	<u>STORED</u>	<u>TESTS</u>
01A-S	B183N3	SHAW-LAB	DISPOS E331S E333S

<u>RELEASED BY</u>	<u>DATE</u>	<u>TRANSFERRED TO</u>	<u>DATE</u>	<u>RECEIVED BY</u>	<u>DATE</u>
<i>KA</i>	12-31-03	SHAW		<i>D. Healy - SHAW-1</i>	1-5-04

PAGE 1 Eberline Srvces  
CONTRACT: PO# RSH-SOW-93-0003

PURCHASE ORDER # R3-12-192-SU-SW  
12/31/03 11:27:42

*SOA 42477*

ORDER Eberline Services/Richmond  
FROM Analytical Services  
2030 Wright Avenue  
Richmond, CA 94804-0040  
ATTEN Purchasing  
PHONE 510-235-2633

INVOICE Eberline Services/Richmond  
TO Analytical Services  
2030 Wright Avenue  
Richmond, CA 94804-0040  
ATTEN Purchasing  
PHONE 510-235-2633

*[Signature]*  
AUTHORIZED BY

ORDER Shaw Geotechnical Laboratory  
TO 1570 Bear Creek Road  
Oak Ridge, TN 37830

Please telephone our Sample Control Department immediately if any problems are encountered in the receipt or the analysis of the samples listed below.

ATTEN Ralph R. Cole

This Purchase Order authorizes Shaw to perform all work listed on the enclosed COC. Alterations to work requested can only be made by Eberline Services or the appropriate Hanford client.

<u>FRACTION TEST</u>	<u>DESCRIPTION</u>	<u>UNITS</u>	<u>DUE DATE</u>	<u>COST</u>
01A	E331S D422 Particle Size-Dry Svc	Please Advise	01/21/04	0.00
	E333S D2216 Moisture Content	Please Advise	01/21/04	0.00
<b>TOTAL CHARGE NOT TO EXCEED</b>				<b>\$0.00</b>

0000014



**PARTS AND TOOLS RETURN (PTR) FORM  
PROJECT HANFORD, 2355 STEVENS DR., RICHLAND, WA 99352**

MR No. <u>N/A</u> Rel. No. <u>N/A</u> P-Card Log No. <u>/A</u>	Source of Material PO No. <u>N/A</u> Contract No. <u>N/A</u> Other <u>N/A</u>	Buyer <u>N/A</u> Telephone <u>N/A</u>	PTR No. <u>12957</u>
Date <u>12/30/03</u>	F.O.B.	Shipment Authorized by: Print Name: <u>M. A. BAECHLER</u>	Total Pieces <u>1</u>

Ship To: <u>EBE</u> <u>INE SERVICES</u> <u>203</u> <u>WRIGHT AVENUE</u> <u>RIC</u> <u>OND, CA 94804</u>  Contact: <u>MEL</u> <u>SA MANNION</u> Contact Phone : <u>(510) 235-2633</u> RA No.: <u>N/A</u>	For Account Of: <u>Fluor Hanford, Inc.</u> <u>2355 Stevens Drive</u> <u>Richland, WA 99352</u>
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Line Item No.	Quantity	UM	Description (Catalog ID No., Serial No., Gov. Tag No.)	Unit Price	Value
1	1	EA	Environmental Samples Packaged in Poly Cooler with Packing Peanuts COOLER # GPP-03-027 SAF # F03-020/F03-025 AIR BILL # <u>7911 0696 1376</u> 41 LB	N/A	N/A

REASON FOR RETURN: <input type="checkbox"/> Credit - Return for Credit (Money Only) - Qty Receipt Required <input type="checkbox"/> Replace - Return for Replacement and/or Repair - Qty Receipt Required <input type="checkbox"/> Inventory - Return to PHMC Inventory <input type="checkbox"/> Over - Return Over Shipment (No Receipt/Not a Credit)	COMMENT: (Check one) <input type="checkbox"/> Return for Credit (Money Only) - Qty Receipt Required <input type="checkbox"/> Return for Replacement and/or Repair - Qty Receipt Required <input type="checkbox"/> Return to PHMC Inventory <input type="checkbox"/> Return Over Shipment (No Receipt/Not a Credit)	MISCELLANEOUS: <input type="checkbox"/> Credit - Contract/P-Card/Non-Passport PO <input type="checkbox"/> Core Charge - Return for Credit of Deposit <input type="checkbox"/> Repair <input type="checkbox"/> Ship Supplier Owned Materials, Containers, Samples, etc. <input type="checkbox"/> Ship Waste/Material for Disposal <input checked="" type="checkbox"/> Ship Govt. Owned Materials, Containers, Samples, etc. <input type="checkbox"/> OTHER
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Hazardous Materials: <input type="checkbox"/> Yes* <input checked="" type="checkbox"/> No Radioactive Material: <input type="checkbox"/> Yes* <input checked="" type="checkbox"/> No Rad. Control Subject: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	T&P Inspection (req'd): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Include appropriate shipping document. Radioactive Material is also hazardous.	Certified Free of Contamination: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Certifier's Name/Date:
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Custodian: <u>M. BAECHLER</u>	Current Location: <u>MO-026/300 AREA</u>	Date Available to Ship: <u>12/30/03</u>
Telephone: <u>530-0638</u>		

Item	% Cost	Cost Center	CACN	COA	Shipping Department	By <u>CR. Mannion</u>
ALL	30	M4P00	119142	ES20	Routing <u>FEDEX AIR</u>	Date Shipped <u>12-30-03</u>
ALL	70	M4P00	119143	ES20	B/L No. _____	OSD&D No. _____
					B/L Wt. _____	Shipping Notice No. _____
					Frt. Collect _____	Receipt No. <u>0000016</u>
					Acct. No. _____	

