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Geotechnical Laboratory
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Oak Ridge TN 37830
(865) 482-6497

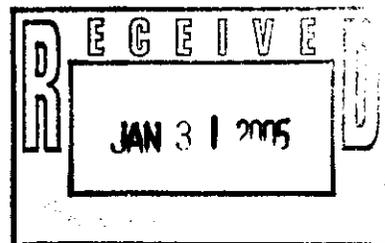
CERTIFICATE OF ANALYSIS

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

January 27, 2005

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.43000000
Client Sample Data Group:	H2894
Date Received by Lab:	December 15, 2004
Number of Samples:	One (1)
Sample Type:	Soil



I. Introduction/Case Narrative

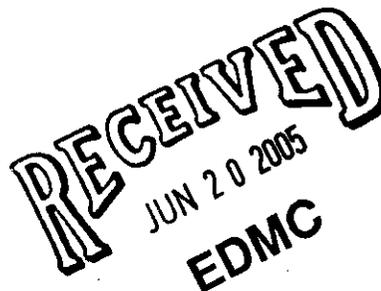
One soil sample was received by the Shaw Geotechnical Laboratory on December 15, 2004. The sample was submitted for determination of bulk density, sieve analysis, hydraulic conductivity, specific gravity, and calcium carbonate content. The sample number received was B19379.

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
Bulk Density of Soils.....	EM 1110-2-1906
Particle-size Analysis of Soils.....	ASTM D 422
Hydraulic Conductivity of Porous Materials Using a Flexible Wall Permeameter.....	ASTM D 5084
Specific Gravity of Soil.....	ASTM D 854
Calcium Carbonate Content.....	ASTM D 4373

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

Page 4 of 11
January 27, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.43000000
SDG No. H2894

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

SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.

CLIENT SAMPLE NO.

MATRIX

BC0495 B19379 Soil

00000005

Appendix B
Sample Test Results

**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B19379

Project No. 100846.43000000

Lab Sample No. BC0495

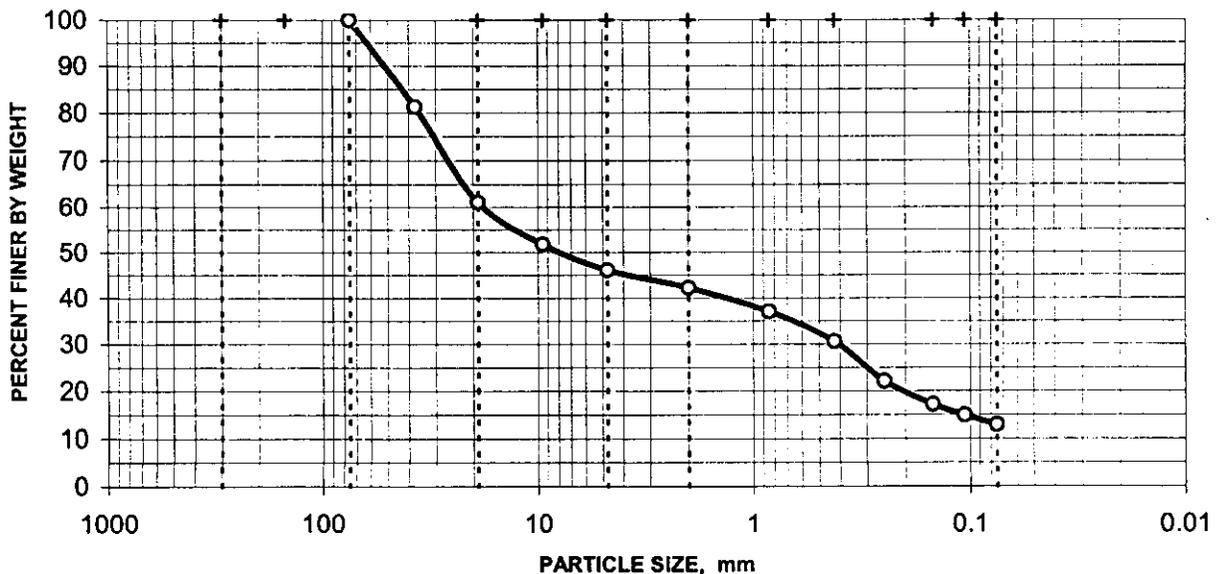
Moisture Content = 8.7%
 based on dry sample weight

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	81.3%
	0.75"	19.000	61.1%
	0.375"	9.500	51.8%
	#4	4.750	46.0%
	#10	2.000	42.2%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	37.0%
	#40	0.425	30.6%
	#60	0.250	22.1%
	#100	0.149	17.1%
	#140	0.106	14.9%
	#200	0.075	12.9%

DISTRIBUTION CURVE



54.0% Gravel

33.1% Sand

12.9% Silt/Clay



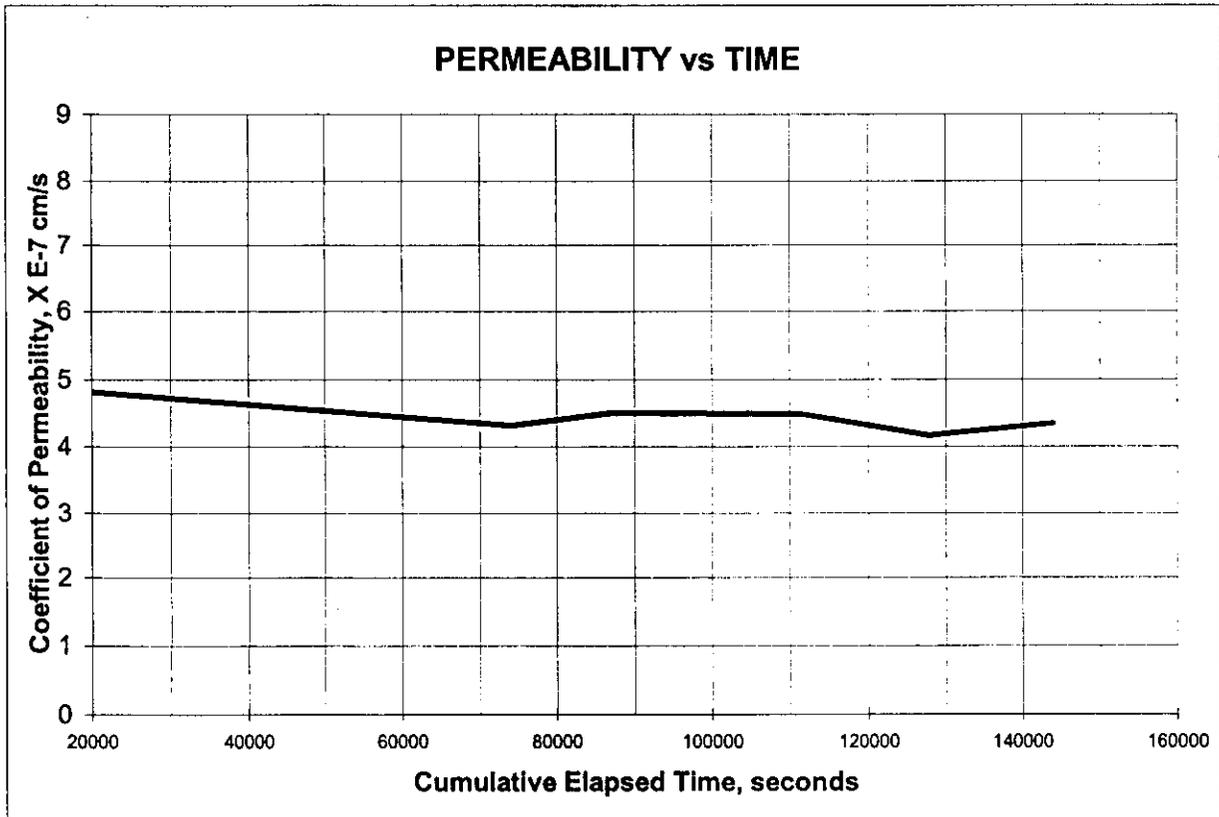
**HYDRAULIC CONDUCTIVITY / PERMEABILITY
 ASTM D 5084**

PROJECT NAME: Eberline Hanford
 PROJECT NO. 100846.43000000

CLIENT SAMPLE NO. B19379
 LAB SAMPLE NO. BC0495

	INITIAL	FINAL		
Specimen diameter, cm	6.51		Hydraulic gradient	14.6
Specimen length, cm	7.22		Min. consolidation stress, psi	2.0
Wet weight of specimen, g.	611.24		Max. consolidation stress, psi	2.5
Specimen cross-sect. area, cm ²	33.31		Total backpressure, psi	7.5
Water content, %	13.0		Permeant Fluid	Deaired DI Water
Wet unit weight, pcf	158.7			
Dry unit weight, pcf	140.4			
Degree of saturation, %	166.3			
Specific gravity of solids	2.73			

Coefficient of Permeability, cm/s 4.4E-07



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

FLUOR Hanford Inc.		CENTRAL PLATEAU CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F04-013-074	Page 1 of 1
Collector Johansen/Alexander/Gent/Thomas	Company Contact Mark Byrnes	Telephone No. 373-3996	Project Coordinator TRENT, SJ		Price Code 8N	Data Turnaround 45 Days
Project Designation 200-UP-1 Remedial Investigation Sampling and Analysis - S	Sampling Location 200-UP-1, C4300; 300-305 340'	12/9/04 PMG	SAF No. F04-013	Air Quality <input type="checkbox"/>		
Ice Chest No. GPK-03-016	Field Logbook No. HNF-N-3841	COA 119324ES10	Method of Shipment Federal Express			
Shipped To Shaw Group	Offsite Property No. SU PTK 14572	Bill of Lading/Air Bill No. SU PTK 14572				

POSSIBLE SAMPLE HAZARDS/REMARKS N/A SDG # H2894	Preservation	None	None																
	Type of Container	Moisture Resistant	Split Spoon Liner																
	No. of Container(s)		2																
	Volume	200g	1000g																

SAMPLE ANALYSIS

Moisture Content - D2116

See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time																
B19379	SOIL	12/9/04	1200		X														

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *	
Relinquished By/Removed From PMGENT/PMGENT	Date/Time 12/9/04 1540	Received By/Stored In Greg Thomas	Date/Time 12/9/04 1540	(1) Bulk Density - D2937; Particle Size (Dry Sieve) - D422; Calcium Carbonate Content; Saturated Hydraulic Conductivity; Particle Density - D854		S=Soil SE=Soilment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dram Solids DL=Dram Liquids T=Tissue WJ=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From Greg Thomas	Date/Time 12/9/04 2215	Received By/Stored In Refugee	Date/Time 12/9/04 2215				
Relinquished By/Removed From MAGENT	Date/Time 12/13/04 0940	Received By/Stored In MAGENT	Date/Time 12/13/04 0940				
Relinquished By/Removed From MAGENT	Date/Time 12/14/04 0930	Received By/Stored In Fed Ex	Date/Time 12/14/04 0930				
Relinquished By/Removed From Fed Ex	Date/Time 12/14/04 0930	Received By/Stored In Fed Ex	Date/Time 12/14/04 0930				

TO: SHAW LAB.

LABORATORY SECTION	Received By Don Hensley	Title SHAW C+I SR. LAB TECH.	Date/Time 12/15/04 0900
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

00000012

SDG# H2894
Eberline Svcs

CHAIN OF CUSTODY

ORD # R4-12-147

12/14/04 11:20:56

WORK ID: SAP# F04-013 SDG H2894

RCVD: 12/14/04 DUE: 01/28/05

KEEP: 01/28/06 DISP: S

<u>DASH</u>	<u>SAMPLE IDENTIFICATION</u>	<u>STORED</u>	<u>TESTS</u>			
01A-S	B19379	SHAW	DISPOS	E329S	E331S	E335S E342S

<u>RELEASED BY</u>	<u>DATE</u>	<u>TRANSFERRED TO</u>	<u>DATE</u>	<u>RECEIVED BY</u>	<u>DATE</u>
<u>J. D. Brown</u>	<u>12/14/04</u>	<u>SHAW LAB</u>	<u>12/19/04</u>	<u>D. Hurling / SHAW EIT</u>	<u>12-15-04</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

BC 0495