



June 20, 2017

CH2M HILL Plateau Remediation Company
 2420 Stevens Center Place
 P.O. Box 1600
 Richland, WA 99354
 Attn.: Tracey A. Burch

Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # W705088, Rev. 0

Enclosed is the final report on geotechnical analyses performed by RJ Lee Group in conjunction with PBS Engineering and Environmental, Inc. (PBS) for Sample Delivery Group number (SDG #) W705088.

General Set Comments

RJ Lee Group received from CH2M-Hill Plateau Remediation Company (CHPRC) 1 sample to be tested for geotechnical analysis at the Columbia Basin Analytical Laboratories. There are no SIRs associated with this SDG.

The CHPRC sample, in SDG # W705088, has been assigned a PBS Geotechnical Lab Sample number per the below table.

CHPRC Sample #	SDG #	Geotechnical Lab Sample #	Date Processed
B39J95	W705088	H-0156	06/19/2017

This project deliverable, provided in Attachment 1, contains the reports of the requested analytical results and a copy of the associated chain of custody for the sample listed above.

The analytical results provided in this deliverable relate only to the items tested. The sample was received in acceptable condition unless otherwise noted in the attached report(s).

I certify that this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the Laboratory Director or a designee as verified by the following signature.

06/20/2017

Donald Smith
 Laboratory Director, Columbia Basin Analytical Laboratories

Date

If you have any questions, please feel free to contact us at 509-545-4989 or email at don.smith@rjleegroup.com.

Attachment 1

PBS Geotechnical Laboratory Testing Results, SDG # W705088,
Dated June 20, 2017



June 19, 2017

Mr. Larry Lockrem
RJ Lee Group, Inc.
2710 North 20th Avenue
Pasco, Washington 99301

Via email: llockrem@rjleegroup.com

Regarding: Geotechnical Laboratory Testing Results
CH2M HILL Plateau Remediation
Sample Delivery Group No. W705088
PBS Project No. 63797.000

Dear Mr. Lockrem:

PBS Engineering and Environmental Inc. (PBS) is pleased to present the results of our recent geotechnical laboratory testing in accordance with the request provided with Sample Delivery Group (SDG) number W705088.

PBS performed the following tests in general accordance with the relevant ASTM Standards:

- Grain Size Analysis (ASTM D422)
- Hydraulic Conductivity–Falling Head (ASTM D5084)

We trust this letter meets your current needs. If you have any questions, or wish to further discuss our observations, conclusions, and recommendations, please contact us at 509.942.1600.

Sincerely,



06/19/2017

Adam M. Swenson, PE
Project Geotechnical Engineer

Attachment(s): Report of Laboratory Testing – Grain-size Analysis
Report of Laboratory Testing – Hydraulic Conductivity–Falling Head
Chain of Custody



REPORT OF LABORATORY TESTING

Report to: CH2M-Hill - Plateau Remediation 2420 Stevens Center Place PO Box 1600 Richland, WA 99354	Date: 6/19/2017
	Sample Delivery Group No.: W705088
	Sample Authorization No.: F16-037

Project: CHPRC Laboratory	Project No.: 63797.000
Report of: Grain Size Analysis - Hydrometer (ASTM D422)	Lab Technician: P. Brice

Items Received:

One sample was provided to us containing soil material obtained by you, the client. PBS performed the following test:

Particle/Grain Size Analysis - Hydrometer (ASTM D422):

Mechanical Grain Size Analyses (wet sieve) were conducted on each of the soil samples to determine their grain size distribution. In addition, hydrometer tests were conducted on portions of the soil samples passing the No. 10 sieve. The results of the mechanical grain size analyses and hydrometer testing are plotted on the attached Figure (Particle Size Analysis Test Results - Hydrometer, pages 1 through 3).

LABORATORY TEST RESULTS

Particle Grain Size Analysis - Hydrometer (ASTM D422) - Sieve Portion

Customer Sample Number	Laboratory Sample Number	Percent Passing by Sieve Size											
		3-in.	1½-in.	¾-in.	½-in.	No. 4	No. 10	No. 20	No. 40	No. 60	No. 100	No. 140	No. 200
B39J95	H-0156	100	89.3	77.1	60.0	46.4	37.7	32.7	28.6	17.1	13.5	11.8	10.7



REPORT OF LABORATORY TESTING

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	Sample Delivery Group No.: W705088
	Sample Authorization No.: F16-037

Project: CHPRC Laboratory	Project No.: 63797.000
Report of: Grain Size Analysis - Hydrometer (ASTM D422)	Lab Technician: P. Brice

Particle/Grain Size Analysis - Hydrometer (ASTM D422):
See page 1 of 3

LABORATORY TEST RESULTS

Particle Grain Size Analysis - Hydrometer (ASTM D422) - Hydrometer Portion

Laboratory Sample Number	Hydrometer Readings													
	2 min		5min		15 min		30 min		60 min		250 min		1440 min	
	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)	Dia. (mm)	Finer (%)
H-0156	0.033	8.9	0.021	7.5	0.012	6.4	0.009	5.5	0.006	4.5	0.002	1.7	0.001	1.6



PARTICLE-SIZE ANALYSIS TEST RESULTS

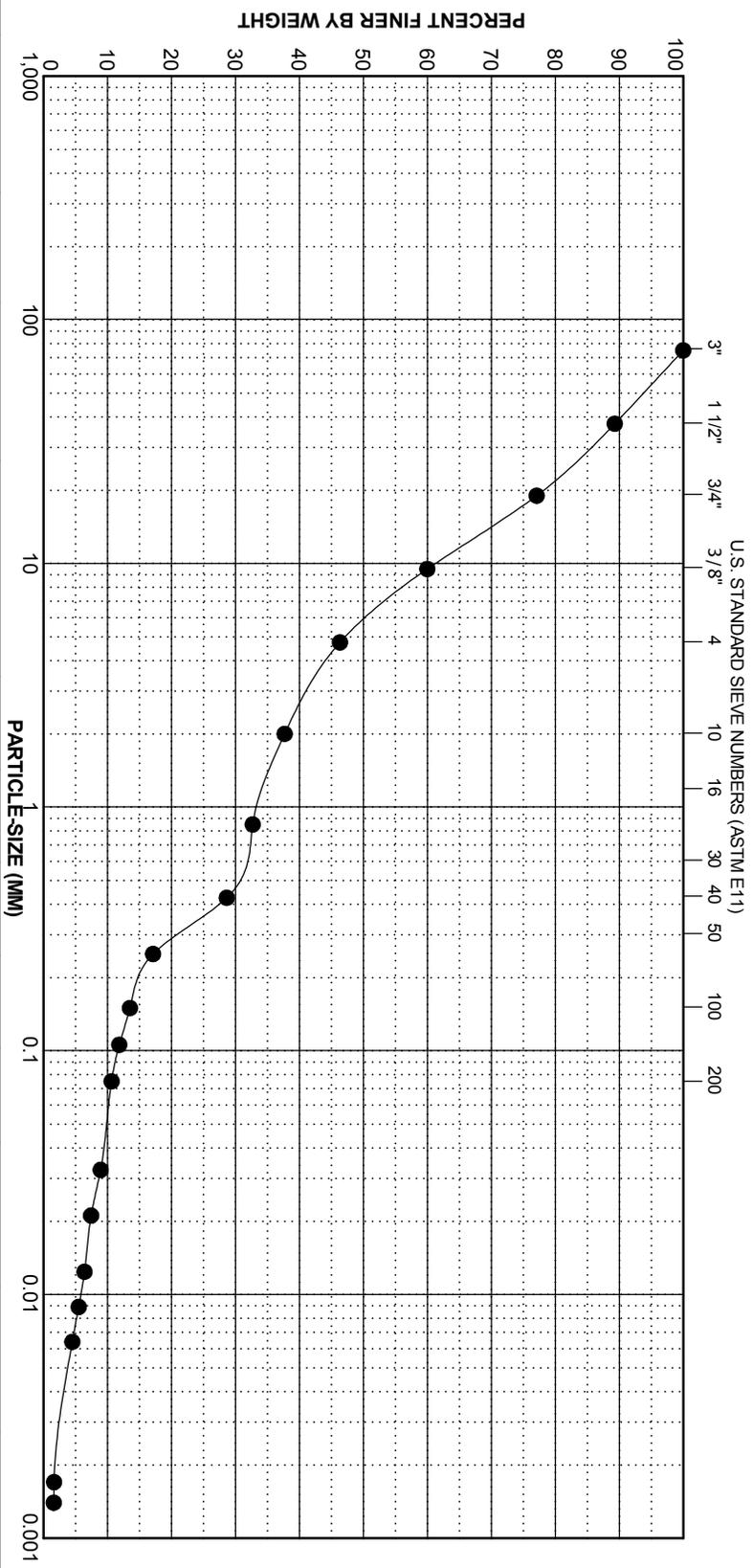
CHPRC - GEOTECHNICAL LABORATORY

PBS PROJECT NUMBER:
63797

PARTICLE-SIZE ANALYSIS-RJ LEE GRP 63797 RESULTS.GPJ PBS DATA\TPL_GEO.GDT PRINT DATE: 6/19/17.RPG

TEST METHOD: ASTM D422

BOULDERS	COBBLES	GRAVEL				SAND			FINES		
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY			



KEY	EXPLORATION NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	D60 (MM)	D50 (MM)	D30 (MM)	D10 (MM)	D5 (MM)	GRAVEL (PERCENT)	SAND (PERCENT)	FINES (PERCENT)
●	H-156	B39J95	160.8	10	9.5	5.7	0.5	0.05	0.01	54	36	11

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco, WA 99301 | 509.545.4989
WWW.RJLEEGROUP.COM


REPORT OF LABORATORY TESTING

Report to:	CH2M-Hill - Plateau Remediation 2420 Stevens Center Place PO Box 1600 Richland, WA 99354	Date:	6/19/2017
		Sample Delivery Group No.:	W705088
		Sample Authorization No.:	F16-037

Project:	CHPRC Laboratory	Project No.:	63797.000
Report of:	Hydraulic conductivity - Falling Head (ASTM D5084)	Lab Tech:	P. Brice

Items Received:

One sample was provided to us containing soil material obtained by you, the client.
PBS performed the following test:

Hydraulic Conductivity - Falling Head (ASTM D5084).

The hydraulic conductivity of the representative soil was determined in the laboratory using the above referenced samples. The samples were prepared for the permeameter and all the required measures were taken. Air was evacuated from the samples and were then saturated with low mineral content water. Once air was evacuated from the sample, the water volume outflow was measured and recorded over time (t). This time was greater than 9 seconds unless measured to the nearest 0.1 second.

LABORATORY TEST RESULTS
Hydraulic Conductivity - Falling Head (ASTM D5084)

Customer Sample Number	Laboratory Sample Number	Date of Analysis	Length of specimen, L (cm)	Specimen area, A (cm ²)	Total discharge time, t (sec)	Head loss across specimen, h (cm)	Hydraulic conductivity, k (cm/s)
B39J95	H-0156	6/13/2017	9.71	43.42	170	31.8	4.11E-05

SHEET 1 OF 1

REVIEWED BY: Adam Swenson, P.E.

REV 0

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		FIG-037-097	PAGE 1 OF 1
COLLECTOR Daniel King CHPRC	COMPANY CONTACT TODAK, D	TELEPHONE NO. 376-6427	PROJECT COORDINATOR TODAK, D	PRICE CODE 8H	DATA TURNAROUND 30 Days / 30 Days
SAMPLING LOCATION C9712, I-005	PROJECT DESIGNATION 100-KR-4 Long Term & Interim Action Monitoring - Soil	FIELD LOGBOOK NO. NA	ACTUAL SAMPLE DEPTH 160.8 - 161.2'	SAF NO. F16-037	<input type="checkbox"/> AIR QUALITY
ICE CHEST NO. NA	FIELD LOGBOOK NO. NA	OFFSITE PROPERTY NO. NA	COA 300085	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO RJ LEE - GEOTECHNICAL	BILL OF LADING/AIR BILL NO. NA				

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS	PRESERVATION	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS
A=Air DL=Drum Liquids DS=Drum Soils L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/1ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.	None 6 Months	1	1000g	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
SPECIAL HANDLING AND/OR STORAGE NA					
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B39J95	SOIL	MAY 08 2017	1310		

06/20/2017

CHAIN OF POSSESSION		SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS	
RELINQUISHED BY/ REMOVED FROM Daniel King CHPRC	DATE/TIME MAY 08 2017 1425	RECEIVED BY/STORED IN SSG	DATE/TIME MAY 08 2017 1425	TRVL-17-102 ** All requests for Geotechnical Parameters will be given a unique HEIS sample number and be assigned to a separate COC. In addition, all split spoon sleeves will be properly stored until authorized for shipment. ** Laboratory shall perform the Particle Size (Dry Sieve) analysis to determine if they should proceed with Permeability by D2434 or Hydraulic Conductivity by D5084. (1) D2434_PERMEABILITY: COMMON; D5084_HYDRRAULIC CONDUCTIVITY: COMMON;	
RELINQUISHED BY/ REMOVED FROM CHPRC	DATE/TIME MAY 09 2017 0650	RECEIVED BY/STORED IN CHPRC	DATE/TIME MAY 09 2017 0650		
RELINQUISHED BY/ REMOVED FROM Frank Head CHPRC	DATE/TIME MAY 09 2017 0910	RECEIVED BY/STORED IN CHPRC	DATE/TIME MAY 09 2017 0910		
RELINQUISHED BY/ REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME		
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

PRINTED ON 4/6/2017 FSR ID = FSR43451 TRVL NUM = TRVL-17-102 A-6003-618 (REV 2)