RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

July 12, 2018

CH2M HILL Plateau Remediation Company
(Geotech)
825 Jadwin Avenue
Richland, WA 99352
Attn.: Scott Fitzgerald

Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # W803152, Rev. 0

Enclosed is the final report on geotechnical analyses performed by RJ Lee Group for Sample Delivery Group number (SDG #) W803152.

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 is one SIR associated with this SDG and it is attached.

The CHPRC sample in SDG # W803152, has been assigned a RJ Lee Group Sample number per the below table.

CHPRC Sample #	SDG #	Date Processed
B3BMT1	W803152	03/26/2018

This project deliverable 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.

7/12/2018

Robert White
Geologist III, Columbia Basin Analytical Laboratories

Date

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

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

REPORT OF LABORATORY TESTING

Report to:	CH2M HILL Plateau Remediation Company (Geotech) 825 Jadwin Avenue Richland, WA 99352 Fitzgerald, SL	**Date:**	6/18/2018
		Sample Delivery Group No.:	NA
		Sample Authorization No.:	NA
Project:	200-DV-1 Operable Unit Char of Waste Site...Soil20	**Project No.:**	F17-009-669
Report of:	Grain Size Analysis - Hydrometer (ASTM D422)	**Lab Technician:**	Robert White

Items Received:
One sample was provided to us containing soil material obtained by you, the client.
Test performed:

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 mechnical 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.	⅜-in.	No. 4	No. 10	No. 20	No. 40	No. 60	No. 100	No. 140	No. 200
B3BMT1	W803152	100	100.0	100.0	100.0	99.9	98.6	93.6	56.8	29.1	21.8	19.6	18.2

SHEET 1 OF 3

REVIEWED BY: Nathan A. Bowles, P.E. 7/12/18

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

REPORT OF LABORATORY TESTING

Report to:	CH2M HILL Plateau Remediation Company (Geotech) 825 Jadwin Avenue Richland, WA 99352 Fitzgerald, SL	**Date:**	6/18/2018
		Sample Delivery Group No.:	NA
		Sample Authorization No.:	NA
Project:	200-DV-1 Operable Unit Char of Waste Site...Soil2(	**Project No.:**	F17-009-669
Report of:	Grain Size Analysis - Hydrometer (ASTM D422)	**Lab Technician:**	Robert White

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 (%)
W803152	0.037	4.2	0.023	4.2	0.014	3.7	0.010	3.3	0.007	2.3	0.003	1.8	0.001	1.8

SHEET 2 OF 3

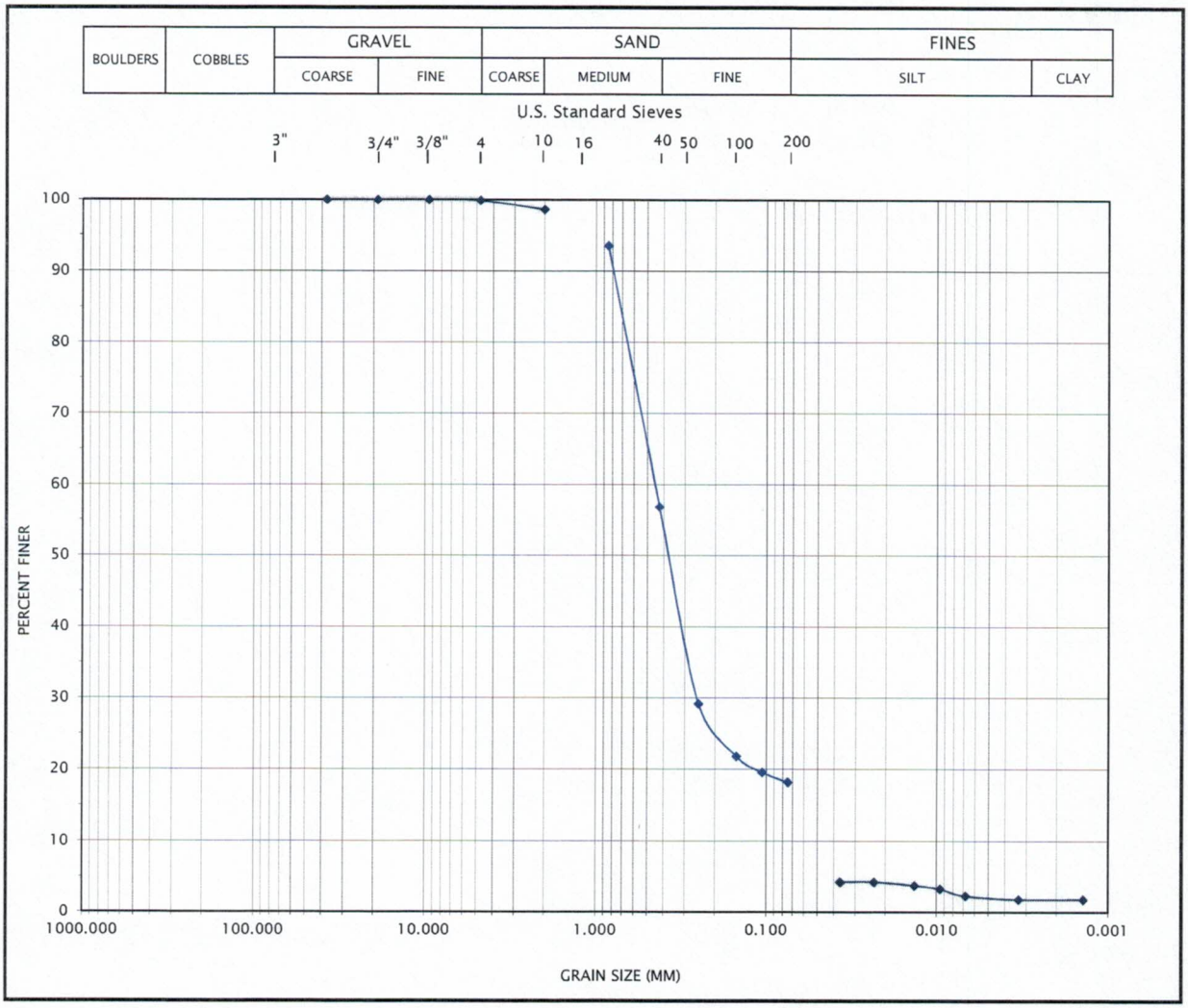
REVIEWED BY: Nathan A. Bowles, P.E. 7/12/18

MECHANICAL GRAINSIZE ANALYSIS - HYDROMETER

Testing Method: ASTM D422

Project Name: 200-DV-1 Operable Unit Char of Waste Site...S...
Project Number: F17-009-669
Sample Location: C9497 Core 23, B39LV6
Sample Depth: 161.0-163.5
Sample Descripion: B3BMT1

Work Order ID: W803152
Lab Tech: Robert White
Date Completed: 5/29/2018



PARTICLE-SIZE (MM)

KEY	SAMPLE NUMBER	MOISTURE CONTENT (PERCENT)	D60 (MM)	D50 (MM)	D30 (MM)	D10 (MM)	D5 (MM)	GRAVEL (PERCENT)	SAND (PERCENT)	FINES (PERCENT)
*	B3BMT1	0	0.45	0.38	0.26	NA	NA	1.4	80.4	18.2

Notes

Reviewed By: Nathan A. Bowles, P.E. Date: 7/12/18

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

REPORT OF LABORATORY TESTING

Report to: CH2M HILL Plateau Remediation Company (Geotech)
825 Jadwin Avenue
Richland, WA 99352
Fitzgerald, SL

Date: 4/30/2018
Sample Delivery Group No.: NA
Sample Authorization No.: NA

Project: 200-DV-1 Operable Unit Char of Waste Site...Soil20 **Project No.:** F17-009-669
Report of: Soil Density (ASTM D2937-10) **Lab Technician:** Robert White

Items Received:
One sample was provided to us containing soil material obtained by you, the client.
Test performed:

Standard Test Method for Density of Soil by the Drive-Cylinder Method (ASTM D2937-10)
This test method covers the determination of in-place density of soil. The test method involves obtaining a relatively intact soil sample by driving a thin-walled cylinder and the subsequent activities for the determination of in-place density. This test method is limited to the procedures necessary for obtaining specimens suitable for determining the in-place density and water content of certain soils. (Soil Density)

LABORATORY TEST RESULTS

Standard Test Method for Density of Soil by the Drive-Cylinder Method (ASTM D2937-10)

Customer Sample Number	Laboratory Sample Number	Volume (ft^3)	Wet WT. of Sample (g)	Wet Density (pcf)	WT. of Water (g)	WT. of Dry Soil (g)	Water Content (%)	Dry Density (pcf)	
B3BMT1	W803152	0.0058	231.92	87.6	10.4	596.8	1.7	86.1	

REVIEWED BY: Nathan A. Bowles, P.E 5/9/18 SHEET 1 of 1

CH2MHill Plateau Remediation Company | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | F17-009-669 - A | PAGE 1 OF 1

COLLECTOR P. Brice	**COMPANY CONTACT** FITZGERALD, SL	**TELEPHONE NO.** 373-7495	**PROJECT COORDINATOR** FITZGERALD, SL
SAMPLING LOCATION C9497, Core 23, B39LV6	**PROJECT DESIGNATION** 200-DV-1 Operable Unit Characterization of Waste Sites Sampling - Soil 20		**SAF NO.** F17-009
ICE CHEST NO. N/A	**FIELD LOGBOOK NO.** NA	**ACTUAL SAMPLE DEPTH** 161.0 – 163.5'	**COA** 302632
SHIPPED TO PNNL 331 BUILDING	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE 8H | **DATA TURNAROUND** | **AIR QUALITY** ☐ | 30 Days / 30 Days

METHOD OF SHIPMENT ~~GOVERNMENT~~ COMPANY VEHICLE 7/21/17 ACM | **ORIGINAL** | 8.9°C

W803152

BLM# 17497
Survey # 331-17-07-012
07/24/2017 MS

PNNL BNID# 7371
Survey # 331-18-03-018
03/26/18 MS

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
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE
NA

PRESERVATION	Cool <=6C
HOLDING TIME	6 Months
TYPE OF CONTAINER	Split Spoon Liner
NO. OF CONTAINER(S)	1 03/12/18 MS
VOLUME	500mL
SAMPLE ANALYSIS	Generic Testing (1): Leaching Sample;

Grab sample 7/21/17 MS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B3BMT1	SOIL	7/21/17	1415	X

ORIGINAL

CHAIN OF POSSESSION | **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Patrick Brice PBrice PBS	7/21/17 1430	JenRussell JenRussell PBS	7/21/17 1430
JenRussell JenRussell PBS	7/21/17 1540	Danielle Saunders PNNL	7/21/2017 1540
Danielle Saunders PNNL	MAR 26 2018 1025	Lesly Wall JCHPRC	MAR 26 2018 1025
Lesly Wall JCHPRC	MAR 26 2018 1110	Jeanne Skog	03/26/18 1110

SPECIAL INSTRUCTIONS
TRVL-17-175; ** The contact at PNL331 is Danielle Saunders (375-3653 or cell 509-430-4669).

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

PRINTED ON 6/28/2017 | **FSR ID = FSR47550** | **TRVL NUM = TRVL-17-175** | A-6003-618 (REV 2)

SAMPLE ISSUE RESOLUTION (SIR) REPORT

SIR Number: SIR18-0549
Rev. Number: 0
Date Initiated: 03/13/2018

SAMPLE EVENT INFORMATION

SAF NUM(S): F17-009

LABORATORY: RJL-GT

SAMPLING INFORMATION

NUMBER OF SAMPLES: 24

SAMPLE NUMBERS: B3BMM6, B3BMN8, B3BMP9, B3BMR5, B3BMT1, B3BMT6, B3BMV2, B3BMW3, B3D1F6, B3D1H3, B3D1H9, B3D1K1, B3D1K8, B3D1L5, B3D1M1, B3DCF7, B3DCH7, B3DCJ2, B3DCJ7, B3DCK2, B3DCK7, B3DCL2, B3DCL7, B3DCM2

SAMPLE MATRIX: SOIL

SDG NUM(S):

ISSUE BACKGROUND

CLASS: General Laboratory Direction

TYPE: Addition of Analyses

DESCRIPTION: RJLee is requested to perform Bulk Density and Particle Size determinations on the above listed soil samples (sample volume will be delivered from PNNL). Upon completion of the requested analysis, RJLee is to return any unused portion of the samples to PNNL.

RESOLUTION

PROPOSED RESOLUTION: See description above. Note: the COCs provided will not list RJLee as the lab and to not have the de3nsity and particle size analysis called out. This SIR is authorization for RJLee to perform the analysis.

FINAL RESOLUTION: Accept proposed resolution

SUBMITTED BY:

FITZGERALD, SL 03/13/2018

ACCEPTED BY:

FURLONG, JJ 03/13/2018

A-6003-640 (REV 4)