

April 16, 2015

CH2M HILL Plateau Remediation Company
2420 Stevens Center Place
P.O. Box 1600
Richland, WA 99352
Attn.: Tracey A. Burch

Subject: Geotechnical Laboratory Testing Services, Data Deliverable for SDG # WA071120140001, 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 #) WA071120140001.

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 # WA071120140001, has been assigned a PBS Geotechnical Lab Sample number per the below table.

CHPRC Sample #	SDG #	Geotechnical Lab Sample #
B2XN93	WA071120140001	H-0018

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.



April 16, 2015

Dr. Heinz Huber
Laboratory Manager, Columbia Basin Analytical Laboratories

Date

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

Attachment 1

PBS Geotechnical laboratory Testing Results, SDG # WA071120140001,
dated March 13, 2015

April 16, 2015



Engineering +
Environmental

March 13, 2015

RJ Lee Group, Inc.
Attn: Mr. Larry Lockrem
Columbia Basin Analytical Laboratories
2710 North 20th Avenue
Pasco, Washington 93301

Re: Geotechnical Laboratory Testing Results
Sample Delivery Group No. WA071120140001
PBS Project No. 63737.000

Dear Mr. Lockrem:

In accordance with your request, PBS Engineering and Environmental Inc. (PBS) is providing you with the results of our recent geotechnical laboratory testing. Our services were provided in accordance with the request provided with Sample Delivery Group (SDG) number WA071120140001.

We performed the following tests:

- Carbonate Content (ASTM D4373)
- Grain Size Analysis - Hydrometer (ASTM D422)
- Hydraulic Conductivity – Constant Head (ASTM D2434)

The appropriate permeability/hydraulic conductivity test (ASTM D2434 or D5084) was selected based on the texture characteristics of the sample received, per section 3.2.2 of the contract. The tests were performed in general accordance with the above-mentioned ASTM Standards, except for the following cases:

- **Grain Size Analysis - Hydrometer (ASTM D422):** The sample did not contain the designated approximate minimum mass of sample based on the nominal diameter of the largest soil particles. The test was performed on the sample mass available, per the direction of RJ Lee and CHPRC.
- **Hydraulic Conductivity – Constant Head (ASTM D2434):** The sample was not tested in a permeameter cylinder appropriately sized based on the maximum particle size of the soil due to the lack of adequate sample volumes provided. The test was performed in the closest appropriately sized cylinder available for the volume of sample provided, per the direction of RJ Lee and CHPRC.

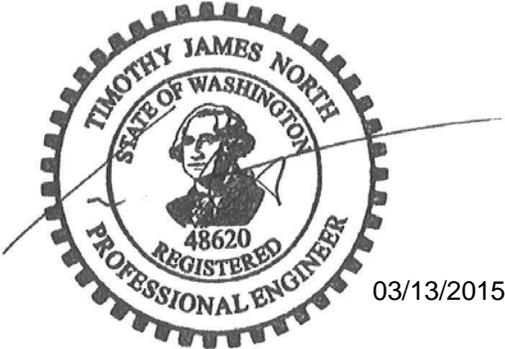
400 Bradley Boulevard, Suite 300, Richland, WA 99352
509.942.1600 Main
866.727.0140 Fax
www.pbsenv.com

April 16, 2015

Mr. Larry Lockrem
Re: Geotechnical Laboratory Testing Results – WA071120140001
March 13, 2015
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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,
PBS Engineering and Environmental, Inc.



Timothy J. North, P.E.
Project Geotechnical Engineer

A handwritten signature in black ink, appearing to read "N.A. Bowles".

Nathan A. Bowles, P.E.
Senior Engineer/Operations Manager

TN/NB

Attachments: Report of Laboratory Testing – Carbonate Content
 Report of Laboratory Testing – Grain-size Analysis - Hydrometer
 Report of Laboratory Testing – Hydraulic Conductivity – Constant Head
 Chain of Custody



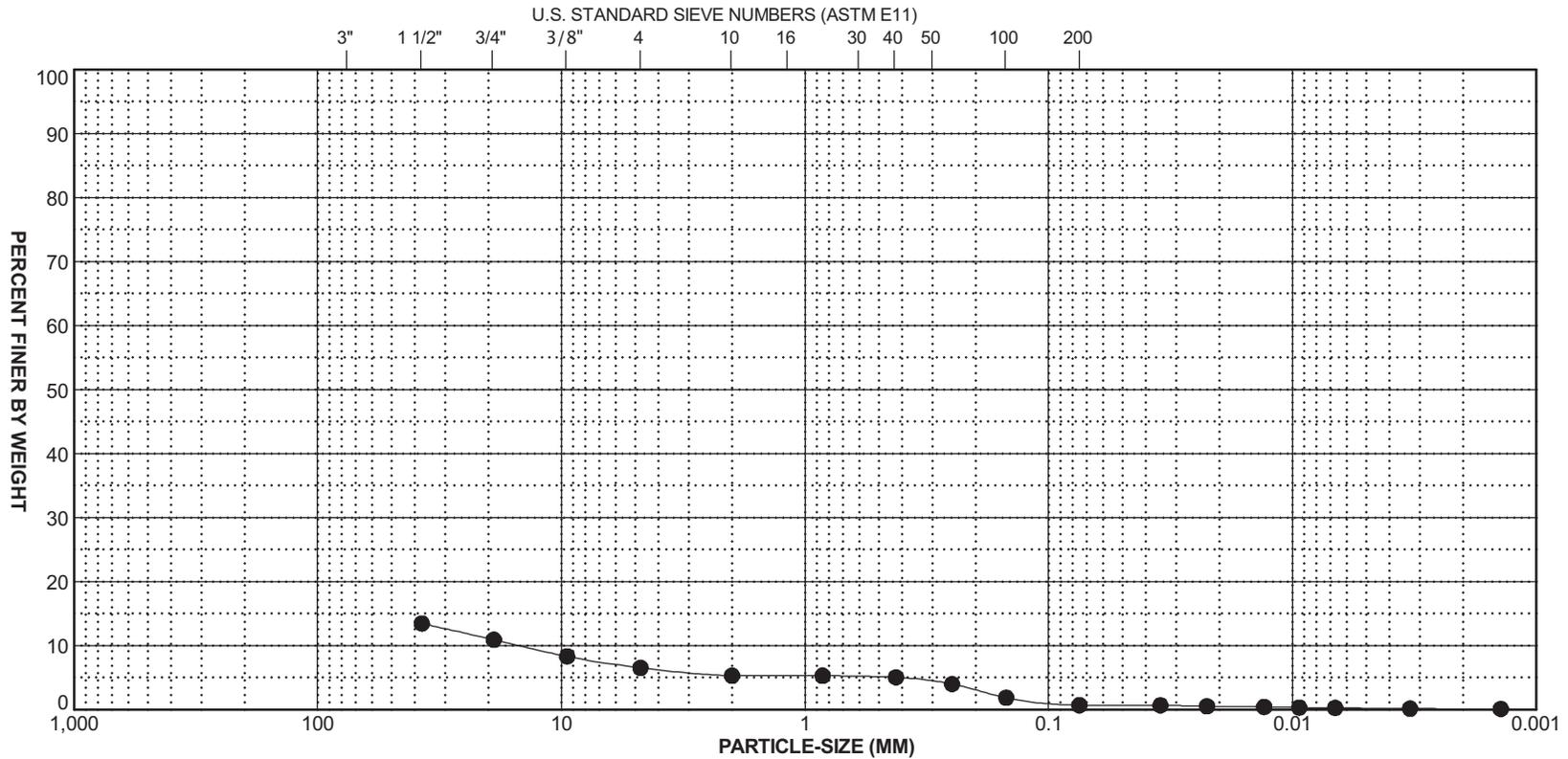
PARTICLE-SIZE ANALYSIS TEST RESULTS

CHPRC - GEOTECHNICAL LABORATORY

PBS PROJECT NUMBER:
63797

TEST METHOD: ASTM C136

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



COLLECTOR *Crow*

COMPANY CONTACT
TODAK, D

TELEPHONE NO.
376-6427

PROJECT COORDINATOR
TODAK, D

PRICE CODE 8H

DATA TURNAROUND
30 Days / 30 Days

SAMPLING LOCATION

PROJECT DESIGNATION
100-KR-4 Long Term & Interim Action Monitoring - Soil

SAF NO.
F13-046

AIR QUALITY

METHOD OF SHIPMENT
FEDERAL EXPRESS

ICE CHEST NO.

FIELD LOGBOOK NO.
HNF-N507-20-74

ACTUAL SAMPLE DEPTH
80.8

COA
300085ES10

ORIGINAL

N/A

OFFSITE PROPERTY NO.
SEE PTR

COA
300085ES10

BILL OF LADING/AIR BILL NO.
SEE PTR

10 of 11

Shaw Group
MATRIX *R.J. Lee*

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR/1ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

PRESERVATION
None

HOLDING TIME
None

TYPE OF CONTAINER
Split Spoon Liner

NO. OF CONTAINER(S)
1

VOLUME
1000g

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

SPECIAL HANDLING AND/OR STORAGE

SAMPLE ANALYSIS

SEE ITEM (1) IN SPECIAL INSTRUCTIONS

17-0018

WA-07112014 0001

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B2XN93	SOIL	11-5-14	1201

CHAIN OF POSSESSION

SIGN/ PRINT NAMES

SPECIAL INSTRUCTIONS

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME	SPECIAL INSTRUCTIONS
<i>Bob Crow</i>	11-5-14	<i>SSU-1</i>	11-5-14	** The 100 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. All requests for Geotechnical Parameters will be given a unique HEIS sample number and be assigned to a separate CHPRC. In addition, all split spoon sleeves will be properly stored until authorized for shipment. TRVL-14-137 (1) Particle Size (Dry Sieve) - D422; Permeability - D2434; Saturated Hydraulic Conductivity; Saturated Hydraulic Conductivity {Hydraulic Conductivity, No CAS}; Calcium Carbonate Content;
<i>R Chen</i>	11-11-14	<i>CHPRC</i>	11-11-14	
<i>CHPRC</i>	11-11-14	<i>CHPRC</i>	11-11-14	
<i>CHPRC</i>	11-11-14	<i>CHPRC</i>	11-11-14	
<i>CHPRC</i>	11-11-14	<i>CHPRC</i>	11-11-14	
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	
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	

TRVL-14-137

April 16, 2015



Geotechnical Laboratory Sample Receipt

Date/Time Received: 11/7/14 10:01

SDG#: WA071120140001

Work Order Number: 300085ES10

SAF# F13-046-053

Shipping Container Identification: GWS-243

- 1. Custody Seals on shipping container intact? Yes No
- 2. Custody Seals dated and signed? Yes No
- 3. Chain-of-Custody record present? Yes No
- 4. Cooler temperature NA
- 5. Vermiculite/packing materials is Wet Dry
- 6. Number of samples in shipping container: 1
- 7. Samples have:
 - tape hazard labels
 - custody seals appropriate sample labels
- 8. Samples are:
 - in good condition for the geotechnical tests required leaking/desiccated
 - broken or disaggregated
- 9. Were any anomalies identified in sample receipt? Yes No
- 10. Description of anomalies (include sample numbers):
- 11. Rad Screen Performed: NA
- 12. Chain of Custody # F13-046-053

Comments: _____

Sample Custodian/Laborator: Christina Lopez Date: 11/7/14

Telephoned to: _____ On _____ by _____ **11 of 11**