SAF-RC-241
100N Sample Collection Supporting
100-N-85 Characterization Borehole
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 2/24/15
INITIAL/DATE

COMMENTS:

SDG X0087 SAF-RC-241

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: EPH Informational Samples 1, 2, 3

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

February 11, 2015

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354

Re: RC-241 UPR-100-N-17 Archive
Work Order: 365697
SDG: X0087

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 23, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4505.

Sincerely,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 1510
Chain of Custody: RC-241-001, RC-241-002 and RC-241-003
Enclosures

Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....3

Laboratory Certifications.....8

Flame Ionization Detector Analysis.....10

Case Narrative.....11

Sample Data Summary.....17

Quality Control Summary.....21

Miscellaneous.....25

Case Narrative

Receipt Narrative
for
Eberline
SDG: X0087
Work Order: 365697

February 11, 2015

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on January 23, 2015 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
365697001	B30C00
365697002	B30C01
365697003	B30C02

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: FID Flame Ionization Detector.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-001	PAGE 1 OF 1
COLLECTOR J.R. Aguilar/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 8K AIR QUALITY ☐	DATA TURNAROUND 15 Days / 45 Days
SAMPLING LOCATION EPH INFORMATIONAL SAMPLE #1	PROJECT DESIGNATION 100-N-85 Characterization Borehole - Soil		SAF NO. RC-241		
ICE CHEST NO. 6WS-180	FIELD LOGBOOK NO. HNF-N-507-28/94	ACTUAL SAMPLE DEPTH 70'	COA 303630	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 5360		BILL OF LADING/AIR BILL NO. 7726 7862 7759		

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

PRESERVATION	Cool <=6C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	120mL
SAMPLE ANALYSIS	Extractable Petroleum Hydrocarbons (EPH);

~~365702~~ 1.30.15

365697

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C00	SOIL	1-22-15	0944	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM J.R. Aguilar/CHPRC	DATE/TIME JAN 2 2 2015 1045	RECEIVED BY/STORED IN L.D. Wall CHPRC L.D. Wall	DATE/TIME JAN 2 2 2015 1045
RELINQUISHED BY/REMOVED FROM L.D. Wall CHPRC L.D. Wall	DATE/TIME JAN 2 2 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FED ex	DATE/TIME	RECEIVED BY/STORED IN K. Kinslow	DATE/TIME 1-23-15 0855
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

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.

** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.

** Include sampling location (drilling ID) on the COC.
TRVL-15-015

TRVL-15-015

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

PRINTED ON 1/20/2015

A-6003-618 (REV 2)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-002	PAGE 1 OF 1
COLLECTOR J.R. Aguilar/CHPRC	COMPANY CONTACT SUMNER, LC	TELEPHONE NO. 376-3922	PROJECT COORDINATOR KESSNER, JH	PRICE CODE 8K	DATA TURNAROUND
SAMPLING LOCATION EPH INFORMATIONAL SAMPLE #2	PROJECT DESIGNATION 100-N-85 Characterization Borehole - Soil		SAF NO. RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO. GWS-180	FIELD LOGBOOK NO. HNF-N-507-28/94	ACTUAL SAMPLE DEPTH 75'	COA 303630	METHOD OF SHIPMENT FEDERAL EXPRESS	ORIGINAL
SHIPPED TO GEL Laboratories, LLC	OFFSITE PROPERTY NO. 5360		BILL OF LADING/AIR BILL NO. 7726 7862 7759		

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

PRESERVATION	Cool <=6C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aG
NO. OF CONTAINER(S)	1
VOLUME	120mL
SAMPLE ANALYSIS	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C01	SOIL	1-22-15	0950	✓

~~365702~~ SE 1.30.15
365697

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM J.R. Aguilar/CHPRC	DATE/TIME JAN 22 2015 1045	RECEIVED BY/STORED IN L.D. Wall CHPRC R.D. Wall	DATE/TIME JAN 22 2015 1045
RELINQUISHED BY/REMOVED FROM L.D. Wall CHPRC R.D. Wall	DATE/TIME JAN 22 2015 1400	RECEIVED BY/STORED IN FEDEX	DATE/TIME
RELINQUISHED BY/REMOVED FROM Fedex	DATE/TIME	RECEIVED BY/STORED IN M. Kinslow [signature]	DATE/TIME 1-23-15 0855
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

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.

** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.

** Include sampling location (drilling ID) on the COC.
TRVL-15-015

TRVL-15-015

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

PRINTED ON 1/20/2015

A-6003-618 (REV 2)

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-003	PAGE 1 OF 1
COLLECTOR: J.R. Aguilar/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: EPH INFORMATIONAL SAMPLE #3	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: 6WS-180	FIELD LOGBOOK NO.: HNF-N-507-28/94	ACTUAL SAMPLE DEPTH: 70'	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5360		BILL OF LADING/AIR BILL NO.: 7726 7862 7759		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS		
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	*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.	PRESERVATION	Cool <=6C
		HOLDING TIME	14 Days
		TYPE OF CONTAINER	aG
		NO. OF CONTAINER(S)	1
		VOLUME	120mL
	SPECIAL HANDLING AND/OR STORAGE	SAMPLE ANALYSIS	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C02	SOIL	1-22-15	1001	✓

~~365702~~ SE 1.30.15
365697

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: J.R. Aguilar/CHPRC	DATE/TIME: JAN 22 2015 1045	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: JAN 22 2015 1045
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: JAN 22 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FEDEX	DATE/TIME:	RECEIVED BY/STORED IN: McGuston	DATE/TIME: 1-23-15 0855
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:

SPECIAL INSTRUCTIONS

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** Include sampling location (drilling ID) on the COC.
TRVL-15-015

TRVL-15-015

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

PRINTED ON 1/20/2015

A-6003-618 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: UCHN/CPRC	SDG/AR/COC/Work Order: 365702 & 365697
Received By: MK	Date Received: 1-23-15 & 1.30.15

Suspected Hazard Information	Yes	No	
			*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): cpm 0
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	
Shipped as a DOT Hazardous?		✓	If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group. Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓	✓		Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	✓	✓		Temperature Device Serial #: 130532776 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?		✓		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.	✓			Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 7726 7431 6298 2.2c 7726 7862 7910 2.3c 7726 7862 7759 1.9c

Comments (Use Continuation Form if needed):

PM (or PM's Designee) Review: Initials: CD Date: 1/23/15

Laboratory Certifications

List of current GEL Certifications as of 11 February 2015

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
South Carolina Chemistry	10120001
South Carolina GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−14−9
Utah NELAP	SC000122014−16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12

Flame Ionization Detector Analysis

Case Narrative

FID Flame Ionization Detector
Technical Case Narrative
Eberline (WCHN)
SDG #: X0087
Work Order #: 365697

Method/Analysis Information

Procedure:	**Massachusetts Method for the Determination of Extractable Petroleum Hydrocarbons (EPH)**
Analytical Method:	WA EPH
Prep Method:	WA EPH
Analytical Batch Number:	1452855
Prep Batch Number:	1452854

Sample Analysis

The following samples were analyzed using the analytical protocol as established in WA EPH:

Sample ID	Client ID
365697001	B30C00
365697002	B30C01
365697003	B30C02
1203251279	MB for batch 1452854
1203251280	Laboratory Control Sample (LCS)
1203251281	365697001(B30C00) Matrix Spike (MS)
1203251282	365697001(B30C00) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-063 REV# 4.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 23.0.

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries were within the acceptance limits in all samples and quality control samples.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 365697001 (B30C00) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS 1203251281 (B30C00MS) recoveries for this SDG were not within the acceptance limits. The parent sample had to be diluted due to the presence of over-range target analytes. As a result, the spike recoveries in the MS/MSD were not within the acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD 1203251282 (B30C00MSD) recoveries for this SDG were not within the acceptance limits. The parent sample had to be diluted due to the presence of over-range target analytes. As a result, the spike recoveries in the MS/MSD were not within the acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
Samples 365697001 (B30C00), 365697002 (B30C01) and 365697003 (B30C02) were diluted due to the presence of overrange target analytes.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Data Exception (DER) Documentation
The following DER was generated for this SDG: 1377837.

Manual Integrations
Samples 1203251281 (B30C00MS), 1203251282 (B30C00MSD), 365697001 (B30C00), 365697002 (B30C01) and 365697003 (B30C02) required manual integration.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The GC-FID analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-5MS	30m x 0.25mm, 0.25um(J&W)
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-WAX	30m x 0.53 mm x 1um
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-624	30m x 0.53mm, 3.0um(J&W)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
02-FEB-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GC/FID	WDOE NWTPH-Dx	Solid	PTQA, WCHN
Batch ID:	**Sample Numbers:**		
1452855	See Below		

Potentially affected work order(s)(SDG): 365487(SOIL-89),365697(X0087)

Application Issues:

Failed Recovery for MS/PS

Failed Recovery for MSD/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. MS (1203251281) and MSD (1203251282) failed spike recovery limits. Please see the QC Summary/Surrogate Recovery report for specific failures.	1. As the MS and MSD displayed similar recoveries, the failures were attributed to sample matrix interference and the data have been reported.

Originator's Name:

Josh Brooks 02-FEB-15

Data Validator/Group Leader:

Cameron Bearden 02-FEB-15

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0087 GEL Work Order: 365697 Project: RC-241 Soil

The Qualifiers in this report are defined as follows:

B The analyte was detected in both the associated QC blank and in the sample.

D Results are reported from a diluted aliquot of sample.

E Concentration exceeds the calibration range of the instrument

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

T Spike and/or spike duplicate sample recovery is outside control limits.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re-analyzed without re-extraction.
RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Cameron Bearden **Name: Cameron Bearden**

Date: 09 FEB 2015 **Title: Group Leader**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: February 9, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 Soil

Client SDG: X0087

Client Sample ID:	B30C00	Project:	WCHN0RC241
Sample ID:	365697001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	22-JAN-15 09:44		
Receive Date:	23-JAN-15		
Collector:	Client		
Moisture:	2.68%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	685	685	1370	ug/Kg	1	JMB3	01/31/15	2354	1452855	1
Aliphatic Hydrocarbons C8-C10	BJT	978	685	1370	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	685	685	1370	ug/Kg	1	JMB3	01/31/15	1151	1452855	2
Aromatic Hydrocarbons C8-C10	U	685	685	1370	ug/Kg	1					
Aliphatic Hydrocarbons >C12-C16	D	283000	34200	68500	ug/Kg	50	JMB3	01/31/15	2302	1452855	3
Aliphatic Hydrocarbons >C16-C21	D	539000	34200	68500	ug/Kg	50					
Aliphatic Hydrocarbons >C21-C34	DJ	59000	34200	68500	ug/Kg	50					
Aromatic Hydrocarbons >C12-C16	DJ	19500	13700	27400	ug/Kg	20	JMB3	02/01/15	1334	1452855	4
Aromatic Hydrocarbons >C16-C21	D	203000	13700	27400	ug/Kg	20					
Aromatic Hydrocarbons >C21-C34	DJT	27100	13700	27400	ug/Kg	20					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	01/27/15	1000	1452854

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	
3	WA EPH	
4	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1110 ug/Kg	1370	81.4	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1420 ug/Kg	1370	104	(60%-140%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: February 9, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 Soil

Client SDG: X0087

Client Sample ID:	B30C01	Project:	WCHN0RC241
Sample ID:	365697002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	22-JAN-15 09:50		
Receive Date:	23-JAN-15		
Collector:	Client		
Moisture:	7.73%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons C8-C10	BT	4520	722	1440	ug/Kg	1	JMB3	02/01/15	0228	1452855	1
Aromatic Hydrocarbons >C10-C12	T	1520	722	1440	ug/Kg	1	JMB3	02/01/15	1610	1452855	2
Aromatic Hydrocarbons C8-C10	U	722	722	1440	ug/Kg	1					
Aliphatic Hydrocarbons >C10-C12	DJT	108000	72200	144000	ug/Kg	100	JMB3	02/01/15	0137	1452855	3
Aliphatic Hydrocarbons >C12-C16	D	1070000	72200	144000	ug/Kg	100					
Aliphatic Hydrocarbons >C16-C21	D	933000	72200	144000	ug/Kg	100					
Aliphatic Hydrocarbons >C21-C34	DU	72200	72200	144000	ug/Kg	100					
Aromatic Hydrocarbons >C12-C16	D	125000	36100	72200	ug/Kg	50	JMB3	02/01/15	1518	1452855	4
Aromatic Hydrocarbons >C16-C21	D	474000	36100	72200	ug/Kg	50					
Aromatic Hydrocarbons >C21-C34	DJT	38000	36100	72200	ug/Kg	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	01/27/15	1000	1452854

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	
3	WA EPH	
4	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1030 ug/Kg	1440	71.4	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1730 ug/Kg	1440	120	(60%-140%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: February 9, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 Soil

Client SDG: X0087

Client Sample ID:	B30C02	Project:	WCHN0RC241
Sample ID:	365697003	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	22-JAN-15 10:01		
Receive Date:	23-JAN-15		
Collector:	Client		
Moisture:	.216%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	668	668	1340	ug/Kg	1	JMB3	02/01/15	0502	1452855	1
Aliphatic Hydrocarbons C8-C10	BJT	1020	668	1340	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	668	668	1340	ug/Kg	1	JMB3	02/01/15	1846	1452855	2
Aromatic Hydrocarbons C8-C10	U	668	668	1340	ug/Kg	1					
Aliphatic Hydrocarbons >C12-C16	D	120000	33400	66800	ug/Kg	50	JMB3	02/01/15	0411	1452855	3
Aliphatic Hydrocarbons >C16-C21	D	268000	33400	66800	ug/Kg	50					
Aliphatic Hydrocarbons >C21-C34	DJ	41800	33400	66800	ug/Kg	50					
Aromatic Hydrocarbons >C12-C16	DJ	17300	13400	26700	ug/Kg	20	JMB3	02/01/15	1755	1452855	4
Aromatic Hydrocarbons >C16-C21	D	113000	13400	26700	ug/Kg	20					
Aromatic Hydrocarbons >C21-C34	DJT	15000	13400	26700	ug/Kg	20					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	01/27/15	1000	1452854

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	
3	WA EPH	
4	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	974 ug/Kg	1340	72.9	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1320 ug/Kg	1340	99.0	(60%-140%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: February 9, 2015

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **365697** **Client SDG:** X0087 **Project Description:** RC-241 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID										
Batch 1452855										
QC1203251280 LCS										
Aliphatic Hydrocarbons >C10-C12	6670			5090	ug/Kg		76.4	(70%-130%)	JMB3	01/30/15 18:42
Aliphatic Hydrocarbons >C12-C16	6670			5630	ug/Kg		84.4	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	6670			5110	ug/Kg		76.6	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	6670		B	5520	ug/Kg		82.8	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	6670			5190	ug/Kg		77.8	(70%-130%)		01/31/15 07:33
Aromatic Hydrocarbons >C12-C16	6670			5410	ug/Kg		81.2	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	13300			10600	ug/Kg		79.3	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	13300			10300	ug/Kg		77.4	(70%-130%)		
**1-Chlorooctadecane	1330			975	ug/Kg		73.2	(60%-140%)		01/30/15 18:42
**o-Terphenyl	1330			1060	ug/Kg		79.7	(60%-140%)		01/31/15 07:33
QC1203251279 MB										
Aliphatic Hydrocarbons >C10-C12			U	667	ug/Kg					01/30/15 17:50
Aliphatic Hydrocarbons >C12-C16			U	667	ug/Kg					
Aliphatic Hydrocarbons >C16-C21			U	667	ug/Kg					
Aliphatic Hydrocarbons >C21-C34			U	667	ug/Kg					
Aliphatic Hydrocarbons C8-C10			J	926	ug/Kg					
Aromatic Hydrocarbons >C10-C12			U	667	ug/Kg					01/31/15 06:42
Aromatic Hydrocarbons >C12-C16			U	667	ug/Kg					
Aromatic Hydrocarbons >C16-C21			U	667	ug/Kg					
Aromatic Hydrocarbons >C21-C34			U	667	ug/Kg					

QC Summary

Workorder: 365697 **Client SDG:** X0087 **Project Description:** RC-241 Soil

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID											
Batch 1452855											
Aromatic Hydrocarbons C8-C10				U	667	ug/Kg					
**1-Chlorooctadecane	1330				930	ug/Kg		69.8	(60%-140%)	JMB3	01/30/15 17:50
**o-Terphenyl	1330				918	ug/Kg		68.9	(60%-140%)		01/31/15 06:42
QC1203251281 365697001 MS											
Aliphatic Hydrocarbons >C10-C12	6850	TU	685		5390	ug/Kg		70.1	(70%-130%)		01/31/15 01:35
Aliphatic Hydrocarbons >C12-C16	6850	E	308000	E	304000	ug/Kg		N/A	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	6850	E	594000	E	589000	ug/Kg		N/A	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	6850	BJT	978	BT	5300	ug/Kg		63*	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	6850	TU	685		5150	ug/Kg		75.3	(70%-130%)		01/31/15 12:43
Aromatic Hydrocarbons >C12-C16	6850	E	27900	E	33200	ug/Kg		N/A	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	13700	E	252000	E	255000	ug/Kg		N/A	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	13700	ET	29800	E	40500	ug/Kg		78.2	(70%-130%)		
**1-Chlorooctadecane	1370		1110		991	ug/Kg		72.3	(60%-140%)		01/31/15 01:35
**o-Terphenyl	1370		1420		1220	ug/Kg		88.8	(60%-140%)		01/31/15 12:43
QC1203251282 365697001 MSD											
Aliphatic Hydrocarbons >C10-C12	6850	TU	685	T	5200	ug/Kg	3.62	67.3*	(0%-20%)		01/31/15 02:26
Aliphatic Hydrocarbons >C12-C16	6850	E	308000	E	264000	ug/Kg	14.1	N/A	(0%-20%)		
Aliphatic Hydrocarbons >C16-C21	6850	E	594000	E	505000	ug/Kg	15.4	N/A	(0%-20%)		
Aliphatic Hydrocarbons C8-C10	6850	BJT	978	BT	4720	ug/Kg	11.5	54.7*	(0%-20%)		
Aromatic Hydrocarbons >C10-C12	6850	TU	685	T	4630	ug/Kg	10.8	67.5*	(0%-20%)		01/31/15 13:35
Aromatic Hydrocarbons >C12-C16	6850	E	27900	E	28500	ug/Kg	15.2	N/A	(0%-20%)		
Aromatic Hydrocarbons >C16-C21	13700	E	252000	E	218000	ug/Kg	15.7	N/A	(0%-20%)		
Aromatic Hydrocarbons >C21-C34	13700	ET	29800	ET	34000	ug/Kg	17.6	30.4*	(0%-20%)		
**1-Chlorooctadecane	1370		1110		934	ug/Kg		68.1	(60%-140%)		01/31/15 02:26

QC Summary

Workorder: **365697** **Client SDG:** X0087 **Project Description:** RC-241 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
GC-FID											
Batch 1452855											
**o-Terphenyl	1370	1420		1180	ug/Kg		85.9	(60%-140%)	JMB3	01/31/15	13:35

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Prep Logbook

Washington Method for the Determination of Extractable Petroleum Hydrocarbons

Batch ID: **1452854** **Verified by:** _____

Analyst: **Sirena White**

Method: **WA EPH**

Lab SOP: **GL-OA-E-075 REV# 0**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203251279 MB	27-JAN-2015 10:00:00	30.005	2	0.06666
1203251280 LCS	27-JAN-2015 10:00:00	30.005	2	0.06666
365487001	27-JAN-2015 10:00:00	20.233	2	0.09885
365487002	27-JAN-2015 10:00:00	20.123	2	0.09939
365697001	27-JAN-2015 10:00:00	30.007	2	0.06665
1203251281 MS (365697001)	27-JAN-2015 10:00:00	30.002	2	0.06666
1203251282 MSD (365697001)	27-JAN-2015 10:00:00	30.001	2	0.06666
365697002	27-JAN-2015 10:00:00	30.009	2	0.06665
365697003	27-JAN-2015 10:00:00	30.006	2	0.06665

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203251280	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MS	1203251281	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MSD	1203251282	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
SURR	All	EPH Extraction Surrogates #1	UE140918-01	1	mL
REGNT	All	Hexane	2182920-B10	50	mL
REGNT	All	Methylene Chloride	2197913-D	150	mL
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

Final Solvent: Hexane
Verified by: SR