

SAF-RC-233
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Soil In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt

H4-21

KW 2/3/15
INITIAL/DATE

COMMENTS:

SDG XP0195

SAF-RC-233

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 100-B-35:1, 151-B Electrical Switchyard



January 27, 2015

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

Re: RC-233 Soil
Work Order: 365503
SDG: XP0195

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on January 21, 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
Project Manager

Purchase Order: 1510
Chain of Custody: RC-233-076
Enclosures



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Case Narrative

**Receipt Narrative
for
Eberline
SDG: XP0195
Work Order: 365503**

January 27, 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 21, 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:

<u>Laboratory ID</u>	<u>Client ID</u>
365503001	J1V216
365503002	J1V217
365503003	J1V218
365503004	J1V219
365503005	J1V220
365503006	J1V221
365503007	J1V222
365503008	J1V223
365503009	J1V224
365503010	J1V225

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: Diesel Range Organics and GC Semivolatile PCB.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Project Coordinator
 KESSNER, JH
 SAF No.
 RC-233
 Method of Shipment
 Commercial Carrier
 Fed Ex
 Bill of Lading/Air Bill No.
 See OSPC

Company Contact
 Telephone No.
 375-4688
 Project Logbook No.
 COA
 010B352600
 Offsite Property No.
 A131306

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C	Type of Container	No. of Container(s)	Volume	Sample Analysis
J1V221	SOIL	01/19/15	1042	aG	1	125mL	TPH-Diesel Range - WTPHLD +	1	125mL	PCBs - 8082
J1V222	SOIL	01/19/15	1046	aG	1	125mL		1	125mL	
J1V223	SOIL	01/19/15	1049	aG	1	125mL		1	125mL	
J1V224	SOIL	01/19/15	1053	aG	1	125mL		1	125mL	
J1V225	SOIL	01/19/15	1056	aG	1	125mL		1	125mL	

POSSIBLE SAMPLE HAZARDS/REMARKS
note

Special Handling and/or Storage
cooling

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>Arlene Stowe</i>	1-19-15 1130	<i>S. Martinez</i>	1-19-15 1545
		<i>C. Bingham</i>	1-19-15 1545
<i>C. Bingham</i>	1-19-15 1555	<i>1010 Battelle Bldg</i>	1-19-15 0715
		<i>C. Bingham</i>	1-20-15 0715
<i>C. Bingham</i>	1-20-15 0720	<i>Fed Ex</i>	1-20-15 0730
		<i>M. B. [Signature]</i>	1-21-15 0845

FINAL SAMPLE DISPOSITION
 Disposal Method
 Disposed By
 Date/Time

SPECIAL INSTRUCTIONS

365503



XP0195



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WCHN</u>		SDG/AR/COC/Work Order: <u>305003</u>
Received By: <u>MIC</u>		Date Received: <u>1-21-15</u>
Suspected Hazard Information	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>Cpm 0</u>
Classified Radioactive II or III by RSO?	<input checked="" type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input checked="" type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input checked="" type="checkbox"/>	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?	<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input checked="" type="checkbox"/>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Preservation Method: Ice bags Blue ice Dry ice None Other (describe) <u>2.2°C</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>130532776</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
7 Are Encore containers present?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sample ID's affected: <u>2 per ID</u>
12 Are sample containers identifiable as GEL provided?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14 Carrier and tracking number.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>7726 3855 0533</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 27 January 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

FID Diesel Range Organics Analysis

Case Narrative

**FID Diesel Range Organics
Eberline (WCHN)
SDG XP0195**

Method/Analysis Information

Procedure: Analysis of Diesel Range Organics by Flame Ionization Detector
Analytical Method: NWTPH-Dx in Soil
Prep Method: SW846 3541
Analytical Batch Number: 1452150
Prep Batch Number: 1452149

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx in Soil:

Sample ID	Client ID
365503001	J1V216
365503002	J1V217
365503003	J1V218
365503004	J1V219
365503005	J1V220
365503006	J1V221
365503007	J1V222
365503008	J1V223
365503009	J1V224
365503010	J1V225
1203249544	MB for batch 1452149
1203249545	Laboratory Control Sample (LCS)
1203249546	365503001(J1V216) Matrix Spike (MS)
1203249547	365503001(J1V216) 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-003 REV# 24.

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

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. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 365503001 (J1V216) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD did not meet the acceptance limits due to relatively lower spike recovery in the MSD.

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. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Package Comment

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. DER #1376121 was generated for this SDG.

Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

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 Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(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. 27-JAN-15	Division: Federal	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/FID	Test / Method: NWTPH-Dx in Soil	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1452150	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 365503(XP0195)

Application Issues:
Failed RPD for MS/MSD, or PS/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. The MS/MSD RPD value did not meet acceptance limits.	1. As the individual MS and MSD recoveries were within their established acceptance criteria, the data have been reported un-qualified for the RPD value failures.

Originator's Name:
Benjamin Taft 27-JAN-15

Data Validator/Group Leader:
Cameron Bearden 27-JAN-15

GEL LABORATORIES LLC

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

Qualifier Definition Report for

WCHN001 Eberline

Client SDG: XP0195 GEL Work Order: 365503 Project: RC-233 Soil

The Qualifiers in this report are defined as follows:

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

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.

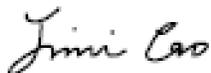
RA Indicates that sample is re-analyzed without re-extraction.

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: 

Name: Jimin Cao

Date: 27 JAN 2015

Title: Data Validator

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V216	Project: WCHN00313
Sample ID: 365503001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:22	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 7.02%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2330	2330	7160	ug/kg	1	BYT1	01/26/15	1449	1452150	1
Motor Oil (C20–C36)	J	3180	2330	7160	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	660 ug/kg	716	92.3	(50%–150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V217	Project: WCHN00313
Sample ID: 365503002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:27	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 8.02%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2350	2350	7240	ug/kg	1	BYT1	01/26/15	1647	1452150	1
Motor Oil (C20–C36)	J	2540	2350	7240	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	578 ug/kg	724	79.7	(50%–150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V218	Project: WCHN00313
Sample ID: 365503003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:30	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 10.8%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2430	2430	7480	ug/kg	1	BYT1	01/26/15	1726	1452150	1
Motor Oil (C20–C36)	J	3030	2430	7480	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	667 ug/kg	748	89.2	(50%–150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V219	Project: WCHN00313
Sample ID: 365503004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:33	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 11.4%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2440	2440	7520	ug/kg	1	BYT1	01/26/15	1805	1452150	1
Motor Oil (C20–C36)	U	2440	2440	7520	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	494 ug/kg	752	65.7	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V220	Project: WCHN00313
Sample ID: 365503005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:38	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 10.5%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2420	2420	7440	ug/kg	1	BYT1	01/26/15	1844	1452150	1
Motor Oil (C20–C36)	U	2420	2420	7440	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	522 ug/kg	744	70.1	(50%–150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V221	Project: WCHN00313
Sample ID: 365503006	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:42	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 7.4%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2340	2340	7200	ug/kg	1	BYT1	01/26/15	1923	1452150	1
Motor Oil (C20–C36)	J	2780	2340	7200	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	573 ug/kg	720	79.5	(50%–150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V222	Project: WCHN00313
Sample ID: 365503007	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:46	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 10.1%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2410	2410	7410	ug/kg	1	BYT1	01/26/15	2119	1452150	1
Motor Oil (C20–C36)	U	2410	2410	7410	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	584 ug/kg	741	78.7	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V223	Project: WCHN00313
Sample ID: 365503008	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:49	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 9.99%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2400	2400	7400	ug/kg	1	BYT1	01/26/15	2157	1452150	1
Motor Oil (C20–C36)	U	2400	2400	7400	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	544 ug/kg	740	73.5	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V224	Project: WCHN00313
Sample ID: 365503009	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:53	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 9.57%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2390	2390	7360	ug/kg	1	BYT1	01/26/15	2236	1452150	1
Motor Oil (C20–C36)	J	3140	2390	7360	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	593 ug/kg	736	80.6	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: January 27, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V225	Project: WCHN00313
Sample ID: 365503010	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:56	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 11.1%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"											
Diesel Range Organics (C10–C20)	U	2440	2440	7500	ug/kg	1	BYT1	01/26/15	2315	1452150	1
Motor Oil (C20–C36)	J	3620	2440	7500	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	VXS1	01/23/15	1153	1452149

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH–Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o–Terphenyl	SW 3541/NWTPH–Dx in Soil "Dry Weight Corrected"	750 ug/kg	750	100	(50%–150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: January 27, 2015

Page 1 of 1

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

Contact: Joan Kessner

Workorder: 365503

Client SDG: XP0195

Project Description: RC–233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1452150										
QC1203249545	LCS										
Diesel Range Organics (C10–C20)	66600			53300	ug/kg		80	(70%–130%)	BYT1	01/26/15	14
Motor Oil (C20–C36)	66600			61800	ug/kg		92.7	(70%–130%)			
**o–Terphenyl	666			585	ug/kg		87.9	(50%–150%)			
QC1203249544	MB										
Diesel Range Organics (C10–C20)			U	2170	ug/kg					01/26/15	13
Motor Oil (C20–C36)			U	2170	ug/kg						
**o–Terphenyl	666			491	ug/kg		73.7	(50%–150%)			
QC1203249546	365503001 MS										
Diesel Range Organics (C10–C20)	71600	U	2330	68000	ug/kg		95	(70%–130%)		01/26/15	15
Motor Oil (C20–C36)	71600	J	3180	76200	ug/kg		102	(70%–130%)			
**o–Terphenyl	716		660	700	ug/kg		97.8	(50%–150%)			
QC1203249547	365503001 MSD										
Diesel Range Organics (C10–C20)	71700	U	2330	53900	ug/kg	23.1*	75.2	(0%–20%)		01/26/15	16
Motor Oil (C20–C36)	71700	J	3180	61500	ug/kg	21.4*	81.4	(0%–20%)			
**o–Terphenyl	717		660	566	ug/kg		78.9	(50%–150%)			

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

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QC Summary

Workorder: 365503

Client SDG: XP0195

Project Description: RC-233 Soil

Page 2 of 2

Parmname	NOM	Sample Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
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 (Organics 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

Extraction of Semivolatile and Nonvolatile Organic Compounds from Soil, Sludge, and Other Miscellaneous Solid Samples

Batch ID: 1452149 **Verified by:** _____
Analyst: Vince Sandifer
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 24
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203249544 MB	23-JAN-2015 11:53:00	30.02	1	0.03331
1203249545 LCS	23-JAN-2015 11:53:00	30.01	1	0.03332
365503001	23-JAN-2015 11:53:00	30.05	1	0.03328
1203249546 MS (365503001)	23-JAN-2015 11:53:00	30.04	1	0.03329
1203249547 MSD (365503001)	23-JAN-2015 11:53:00	30.01	1	0.03332
365503002	23-JAN-2015 11:53:00	30.02	1	0.03331
365503003	23-JAN-2015 11:53:00	30	1	0.03333
365503004	23-JAN-2015 11:53:00	30.01	1	0.03332
365503005	23-JAN-2015 11:53:00	30.03	1	0.0333
365503006	23-JAN-2015 11:53:00	30	1	0.03333
365503007	23-JAN-2015 11:53:00	30	1	0.03333
365503008	23-JAN-2015 11:53:00	30.03	1	0.0333
365503009	23-JAN-2015 11:53:00	30.05	1	0.03328
365503010	23-JAN-2015 11:53:00	30.01	1	0.03332

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203249545	AZDRO SPIKE LCS STD,4000ug/ml	WF1150117-62	1	mL	Final Solvent CH2Cl2
MS	1203249546	AZDRO SPIKE LCS STD,4000ug/ml	WF1150117-62	1	mL	Verified by SW
MSD	1203249547	AZDRO SPIKE LCS STD,4000ug/ml	WF1150117-62	1	mL	
SURR	All	20 ppm surrogate	WE141120-04	1	mL	All samples were dirt mixed with rocks.
REGNT	All	Methylene Chloride	2197913-D	120	mL	365503005-365503009 were muddy.
SOURC	All	SODIUM SULFATE	2193342	30	g	

PCB Analysis

Case Narrative

**PCB Case Narrative
Eberline (WCHN)
SDG XP0195**

Method/Analysis Information

Procedure: Analysis of Polychlorinated Biphenyls by ECD
Analytical Method: SW846 3541/8082A
Prep Method: SW846 3541
Analytical Batch Number: 1452234
Prep Batch Number: 1452233

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 3541/8082A:

Sample ID	Client ID
365503001	J1V216
365503002	J1V217
365503003	J1V218
365503004	J1V219
365503005	J1V220
365503006	J1V221
365503007	J1V222
365503008	J1V223
365503009	J1V224
365503010	J1V225
1203249787	MB for batch 1452233
1203249788	Laboratory Control Sample (LCS)
1203249789	365503003(J1V218) Matrix Spike (MS)
1203249790	365503003(J1V218) 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-040 REV# 20.

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

Calibration Information

A complete list of the initial calibration data files are shown in the Calibration History report located in the Standard Data section of the data package.

Initial Calibration

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

Continuing Calibration Verification (CCV) Requirements

All associated calibration verification standards (ICV or CCV) met the acceptance criteria. All analytes were within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

All surrogate recoveries were within the established acceptance criteria for the samples in this SDG in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 365503003 (J1V218) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries were within the established 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. All reported analyte detections in client and quality control samples were within the established retention time windows. Reported analyte concentrations were confirmed on dissimilar columns. All sample extracts were cleaned using alumina. Additionally, copper was added to all sample extracts to remove sulfur.

Sample Dilutions

The samples in this SDG in this batch did not require dilutions.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this batch.

Miscellaneous Information

Electronic Package Comment

The following package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A DER was not required for the samples in this SDG in this batch.

Manual Integrations

Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this PCB fraction.

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 following additional comments were required:

The higher results from either column have been chosen and reported in the data package for the client samples, MB and LCS. The data reported for the MS and MSD are from the same analytical column as the parent sample.

Due to software issue, the surrogate recovery range was not indicated or possibly indicated incorrectly in Quantitation Report. Please see Surrogate Recovery Report for correct surrogate acceptance limits.

Due to rounding differences in the calculation between the forms, the data reported in Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Aroclors quantitated on the raw data report by ChemStation data system do not necessarily represent positive Aroclor identification. In order for positive identification to be made, the Aroclor must match in pattern and retention time; as well as quantitate relatively close between the primary and confirmation columns, as specified in SW846 method 8000. When these conditions are not met, the Aroclor is reported as a non-detect on the data report.

System Configuration

The Semi-Volatiles-PCB analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD9A.I_1	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 1	30m x 0.25mm, 0.25um

ECD9A.I_2	Agilent 7890A Gas Chromatograph/Dual ECD w/ 7693 Autosampler	7890A GC/ECD	Restek Rtx-CLPest 2	30m x 0.25mm, 0.20um
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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.

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Qualifier Definition Report for

WCHN001 Eberline

Client SDG: XP0195 GEL Work Order: 365503 Project: RC-233 Soil

The Qualifiers in this report are defined as follows:

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.

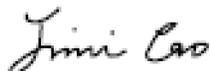
RA Indicates that sample is re-analyzed without re-extraction.

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: 

Name: Jimin Cao

Date: 26 JAN 2015

Title: Data Validator

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: January 26, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V216	Project: WCHN00313
Sample ID: 365503001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:22	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 7.02%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi–Volatiles–PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor–1016	U	1.19	1.19	3.58	ug/kg	1	YS1	01/24/15	1334	1452234	1
Aroclor–1221	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1232	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1242	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1248	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1254	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1260	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1262	U	1.19	1.19	3.58	ug/kg	1					
Aroclor–1268	U	1.19	1.19	3.58	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	01/23/15	1023	1452233

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	6.85 ug/kg	7.16	95.6	(29%–106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	7.98 ug/kg	7.16	111	(25%–131%)

Notes:

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Certificate of Analysis

Report Date: January 26, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V217	Project: WCHN00313
Sample ID: 365503002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:27	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 8.02%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi–Volatiles–PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor–1016	U	1.21	1.21	3.62	ug/kg	1	YS1	01/24/15	1349	1452234	1
Aroclor–1221	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1232	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1242	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1248	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1254	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1260	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1262	U	1.21	1.21	3.62	ug/kg	1					
Aroclor–1268	U	1.21	1.21	3.62	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	01/23/15	1023	1452233

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	7.06 ug/kg	7.25	97.5	(29%–106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	8.02 ug/kg	7.25	111	(25%–131%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: January 26, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V218
 Sample ID: 365503003
 Matrix: SOIL
 Collect Date: 19–JAN–15 10:30
 Receive Date: 21–JAN–15
 Collector: Client
 Moisture: 10.8%

Project: WCHN00313
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi–Volatiles–PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor–1016	U	1.24	1.24	3.74	ug/kg	1	YS1	01/24/15	1404	1452234	1
Aroclor–1221	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1232	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1242	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1248	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1254	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1260	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1262	U	1.24	1.24	3.74	ug/kg	1					
Aroclor–1268	U	1.24	1.24	3.74	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	01/23/15	1023	1452233

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	6.93 ug/kg	7.47	92.7	(29%–106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	7.89 ug/kg	7.47	106	(25%–131%)

Notes:

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Certificate of Analysis

Report Date: January 26, 2015

Company : WC–Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4–21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC–233 Soil

Client SDG: XP0195

Client Sample ID: J1V220	Project: WCHN00313
Sample ID: 365503005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 19–JAN–15 10:38	
Receive Date: 21–JAN–15	
Collector: Client	
Moisture: 10.5%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi–Volatiles–PCB											
SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"											
Aroclor–1016	U	1.24	1.24	3.71	ug/kg	1	YS1	01/24/15	1506	1452234	1
Aroclor–1221	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1232	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1242	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1248	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1254	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1260	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1262	U	1.24	1.24	3.71	ug/kg	1					
Aroclor–1268	U	1.24	1.24	3.71	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	01/23/15	1023	1452233

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	
2	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	7.18 ug/kg	7.43	96.7	(29%–106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	7.86 ug/kg	7.43	106	(25%–131%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: January 26, 2015

Page 1 of 1

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

Contact:

Workorder: 365503

Client SDG: XP0195

Project Description: RC-233 Soil

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1452234										
QC1203249788	LCS										
Aroclor-1016	33.3			25.0	ug/kg		75.1	(44%-97%)	YS1	01/24/15	13
Aroclor-1260	33.3			31.7	ug/kg		95.3	(49%-109%)			
**4cmx	6.66			6.42	ug/kg		96.3	(29%-106%)			
**Decachlorobiphenyl	6.66			7.29	ug/kg		109	(25%-131%)			
QC1203249787	MB										
Aroclor-1016			U	1.11	ug/kg					01/24/15	13
Aroclor-1221			U	1.11	ug/kg						
Aroclor-1232			U	1.11	ug/kg						
Aroclor-1242			U	1.11	ug/kg						
Aroclor-1248			U	1.11	ug/kg						
Aroclor-1254			U	1.11	ug/kg						
Aroclor-1260			U	1.11	ug/kg						
Aroclor-1262			U	1.11	ug/kg						
Aroclor-1268			U	1.11	ug/kg						
**4cmx	6.66			6.28	ug/kg		94.3	(29%-106%)			
**Decachlorobiphenyl	6.66			7.25	ug/kg		109	(25%-131%)			
QC1203249789	365503003 MS										
Aroclor-1016	37.3	U	1.24	18.7	ug/kg		50.1	(22%-127%)		01/24/15	14
Aroclor-1260	37.3	U	1.24	24.6	ug/kg		66	(18%-130%)			
**4cmx	7.46		6.93	5.28	ug/kg		70.8	(29%-106%)			
**Decachlorobiphenyl	7.46		7.89	5.69	ug/kg		76.3	(25%-131%)			

GEL LABORATORIES LLC

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QC Summary

Workorder: 365503 **Client SDG:** XP0195 **Project Description:** RC-233 Soil **Page 2 of 2**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1452234										
QC1203249790	365503003	MSD									
Aroclor-1016	37.3	U	1.24	24.0	ug/kg	24.7	64.3	(0%-30%)	YS1	01/24/15	14
Aroclor-1260	37.3	U	1.24	32.3	ug/kg	26.9	86.5	(0%-30%)			
**4cmx	7.46		6.93	6.59	ug/kg		88.3	(29%-106%)			
**Decachlorobiphenyl	7.46		7.89	7.71	ug/kg		103	(25%-131%)			

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 (Organics 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

Automated Soxhlet Extraction

Batch ID: 1452233 Verified by: _____
 Analyst: Mia DeLee
 Method: SW846 3541

Lab SOP: GL-OA-E-066 REV# 5
 Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Clean Up 1 Amount 1 (mL)	Clean Up Post Clean Up Amount 1 (mL)	Final Volume (mL)	Prepped Factor (mL/g)
1203249787 MB	23-JAN-2015 10:23:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
1203249788 LCS	23-JAN-2015 10:23:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
365503001	23-JAN-2015 10:23:00	30.04	H2SO4/KM 2 nO4	9	1	0.03329
365503002	23-JAN-2015 10:23:00	30.01	H2SO4/KM 2 nO4	9	1	0.03332
365503003	23-JAN-2015 10:23:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
1203249789 MS (365503003)	23-JAN-2015 10:23:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
1203249790 MSD (365503003)	23-JAN-2015 10:23:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
365503004	23-JAN-2015 10:23:00	30.04	H2SO4/KM 2 nO4	9	1	0.03329
365503005	23-JAN-2015 10:23:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
365503006	23-JAN-2015 10:23:00	30	H2SO4/KM 2 nO4	9	1	0.03333
365503007	23-JAN-2015 10:23:00	30.16	H2SO4/KM 2 nO4	9	1	0.03316
365503008	23-JAN-2015 10:23:00	30.15	H2SO4/KM 2 nO4	9	1	0.03317
365503009	23-JAN-2015 10:23:00	30.15	H2SO4/KM 2 nO4	9	1	0.03317
365503010	23-JAN-2015 10:23:00	30.15	H2SO4/KM 2 nO4	9	1	0.03317

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203249788	PCB Laboratory Control	WE141210-06	1	mL	Final Solvent: Hexane
MS	1203249789	PCB Laboratory Control	WE141210-06	1	mL	Verified by: VS
MSD	1203249790	PCB Laboratory Control	WE141210-06	1	mL	Clean-up: H2SO4/KMnO4
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE150114-01	1	mL	Prior to clean-up: 2mL
REGNT	All	5% Potassium Permanganate	2176611	5	mL	Clean-up: MD
REGNT	All	Hexane	2182920-B10	120	mL	Clean-up SOP: GL-OA-E-037 Rev. 7
REGNT	All	1:1 sulfuric acid	2197162	5	mL	Clean-up date: 01-23-15
SOURC	All	SODIUM SULFATE	2193342	30	g	All samples contained rocks. Samples 365503005-365503009 were muddy.