

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 11/17/14
INITIAL/DATE

COMMENTS:

SDG XP0160

SAF-RC-233

Rad only

Chem only

Rad & Chem

Complete

Partial

**Sample Location: 100-B-35:1, electrical switchyard, IP,
151-B**



November 11, 2014

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

Re: RC-233 Soil
Work Order: 360604
SDG: XP0160

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on November 05, 2014. 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. 1616.

Sincerely,

Orlette Johnson
Project Manager

Purchase Order: 1510
Chain of Custody: RC-233-071
Enclosures



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Case Narrative

**Receipt Narrative
for
WC-HANFORD, INC.
SDG: XP0160
Work Order: 360604**

November 11, 2014

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 November 05, 2014 for analysis.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
360604001	J1V1C8
360604002	J1V1C9
360604003	J1V1N7
360604004	J1V1N8
360604005	J1V1N9

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.



Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

Washington Closure Hanford **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **RC-233-071** Page 1 of 1

Collector: WEBER, HC Telephone No. 375-4688 Project Coordinator: KESSNER, JH Price Code: 8A Data Turnaround: 3 days

Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites Sampling Location: 100-B-35-1, Electrical switchyard, IP 151-B SAF No. RC-233

Ice Chest No. RCC-07-004 Field Logbook No. EL-1667-02 Method of Shipment: Fed Ex Commercial Carrier: Fed Ex

Shipped To: GEL Laboratories Charleston Offsite Property No. A131267 Bill of Lading/Air Bill No. See OSRC

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C
J1V1C8	SOIL	11/03/14	0833	aG	1	X
J1V1C9	SOIL	11/03/14	0836	aG	1	X
J1V1W7	SOIL	11/03/14	0844		1	X
J1V1W8	SOIL	11/03/14	0848		1	X
J1V1W9	SOIL	11/03/14	0851		1	X

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
Cool 4C

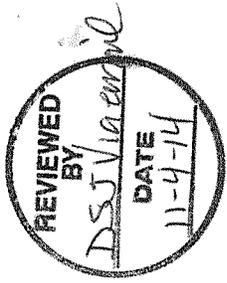
Sample Analysis
PCBs - 8082
TPH-Diesel Range - WTPHD +

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	Cool 4C
J1V1C8	SOIL	11/03/14	0833	aG	1	X
J1V1C9	SOIL	11/03/14	0836	aG	1	X
J1V1W7	SOIL	11/03/14	0844		1	X
J1V1W8	SOIL	11/03/14	0848		1	X
J1V1W9	SOIL	11/03/14	0851		1	X

SPECIAL INSTRUCTIONS

CHAIN OF POSSESSION

Relinquished By/Removed From: Heather Weber	Date/Time: 11/03/14 1245	Received By/Stored In: WCH #103/14	Date/Time: 0900
Relinquished By/Removed From: Wushea Wushea	Date/Time: 11/03/14 1245	Received By/Stored In: C. Bingham	Date/Time: 11-3-14 1245
Relinquished By/Removed From: C. Bingham	Date/Time: 11-3-14 1330	Received By/Stored In: 1060 Bachtelle, fridge #1A	Date/Time: 11-3-14 1330
Relinquished By/Removed From: 1060 Bachtelle, fridge #1A	Date/Time: 11-4-14 0800	Received By/Stored In: C. Bingham	Date/Time: 11-4-14 0800
Relinquished By/Removed From: C. Bingham	Date/Time: 11-4-14 0805	Received By/Stored In: Fed Ex	Date/Time: 11-4-14 0805
Relinquished By/Removed From: Fed Ex	Date/Time: 11-4-14 0805	Received By/Stored In: P. Ventarica	Date/Time: 11/5/14 0805
Relinquished By/Removed From: P. Ventarica	Date/Time: 11/5/14 0805	Received By/Stored In: Fed Ex	Date/Time: 11/5/14 0805



XP0160

FINAL SAMPLE DISPOSITION

Disposal Method: _____

Disposed By: _____

Date/Time: _____



SAMPLE RECEIPT & REVIEW FORM

Client: <u>WCHW</u>		SDG/AR/COC/Work Order: <u>360604</u>	
Received By: <u>Palant</u>		Date Received: <u>11/5/14</u>	
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?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0/cpm</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"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <u>2c</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): <u>130462966</u>
3 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?		<input checked="" 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"/>		Sample ID's and containers affected:
7 Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12 Are sample containers identifiable as GEL provided?			<input checked="" type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			
14 Carrier and tracking number.				Circle Applicable: <u>FedEx Air</u> FedEx Ground UPS Field Services Courier Other <u>7717 3265 4713</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 11 November 2014

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
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	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
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
Wisconsin	999887790

FID Diesel Range Organics Analysis

Case Narrative

**FID Diesel Range Organics
WC-HANFORD, INC. (WCHN)
SDG XP0160**

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: 1433889
Prep Batch Number: 1433888

Sample Analysis

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

Sample ID	Client ID
360604002	J1V1C9
360604003	J1V1N7
360604004	J1V1N8
360604005	J1V1N9
1203203831	MB for batch 1433888
1203203832	Laboratory Control Sample (LCS)
1203203833	360604002(J1V1C9) Matrix Spike (MS)
1203203834	360604002(J1V1C9) 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 the samples reported in this batch.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 360604002 (J1V1C9) 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 not within the established acceptance limits due to extraction efficiency issue.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD did not meet the acceptance limits due to low 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

Sample 360604005 (J1V1N9) was diluted due to the presence of over-range target analytes.

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required for the samples reported in this batch.

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 #1353282 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)

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:	1434858
Prep Batch Number:	1434857

Sample Analysis

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

Sample ID	Client ID
360604001	J1V1C8
1203206462	MB for batch 1434857
1203206463	Laboratory Control Sample (LCS)
1203206464	360604001(J1V1C8) Matrix Spike (MS)
1203206465	360604001(J1V1C8) 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

QC sample 1203206462 (MB) did not meet surrogate spike recovery acceptance limits; however, this had no adverse effects on the data as the associated WCHN sample met surrogate recovery acceptance criteria and was not detected with any of the target analytes.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 360604001 (J1V1C8) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recovery was not within the established acceptance limits for Diesel Range Organics due to sample matrix interference as the MS and MSD failed spike recovery in the same manner.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was not within the established acceptance limits for Diesel Range Organics due to sample matrix interference as the MS and MSD failed spike recovery in the same manner.

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. 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

Sample 360604001 (J1V1C8) was extracted and analyzed twice due to low surrogate recovery in the first analysis. The second analysis met surrogate recovery acceptance criteria and the results were reported in this data package.

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 #1354096 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. 09-NOV-14	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: 1433889	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 360604(XP0160)

Application Issues:

Failed RPD for MS/MSD, or PS/PSD

Failed Recovery for MSD/PSD

**Specification and Requirements
Exception Description:**

DER Disposition:

1. The MSD(1203203834) did not meet spike recovery acceptance limits.
2. The MS/MSD RPD value did not meet surrogate spike recovery acceptance limits.

1. The failure was due to extraction efficiency issue. The LCS and MS recovered well with in the spike recovery acceptance limits. The parent sample of the MS and MSD met surrogate recovery acceptance criteria. The data were reported.
2. The failure was due to low spike recovery in the MSD. The data were reported.

Originator's Name:

Benjamin Taft 09-NOV-14

Data Validator/Group Leader:

Jimin Cao 11-NOV-14

DATA EXCEPTION REPORT

Mo.Day Yr. 11-NOV-14	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: 1434858	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 360604(XP0160)			
Application Issues: Failed Recovery for MS/PS Failed Yield for Surrogates Failed Recovery for MSD/PSD			
Specification and Requirements Exception Description:		DER Disposition:	
<ol style="list-style-type: none"> The MB(1203206462) did not meet surrogate spike recovery acceptance limits. The MS(1203206464) and MSD(1203206465) did not meet spike recovery acceptance limits. 		<ol style="list-style-type: none"> This non-compliance had no adverse effects on the data as the associated WCHN sample had no detection of the target analytes and met surrogate recovery acceptance criteria. Data were reported. 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:
Benjamin Taft 11-NOV-14

Data Validator/Group Leader:
Jimin Cao 11-NOV-14

GEL LABORATORIES LLC

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

Qualifier Definition Report for

WCHN001 WC–HANFORD, INC.

Client SDG: XP0160 GEL Work Order: 360604 Project: RC–233 Soil

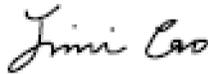
The Qualifiers in this report are defined as follows:

- D Results are reported from a diluted aliquot of sample.
- 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: 

Name: Jimin Cao

Date: 11 NOV 2014

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: November 11, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1C8	Project: WCHN00313
Sample ID: 360604001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03–NOV–14 08:33	
Receive Date: 05–NOV–14	
Collector: Client	
Moisture: 5.49%	

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)	TU	2290	2290	7040	ug/kg	1	BYT1	11/11/14	1319	1434858	1
Motor Oil (C20–C36)	U	2290	2290	7040	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	SJW1	11/06/14	1021	1433888
SW846 3541	3541 DRO IN SOIL PREP	SJW1	11/10/14	1020	1434857

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"	399 ug/kg	704	56.6	(50%–150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 11, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1C9	Project: WCHN00313
Sample ID: 360604002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03–NOV–14 08:36	
Receive Date: 05–NOV–14	
Collector: Client	
Moisture: 7.95%	

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)	T	36400	2350	7220	ug/kg	1	BYT1	11/07/14	1853	1433889	1
Motor Oil (C20–C36)	T	27600	2350	7220	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	SJW1	11/06/14	1021	1433888

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"	563 ug/kg	722	78.1	(50%–150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 11, 2014

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

Client SDG: XP0160

Client Sample ID: J1VIN7	Project: WCHN00313
Sample ID: 360604003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03–NOV–14 08:44	
Receive Date: 05–NOV–14	
Collector: Client	
Moisture: 5.82%	

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)	JT	2470	2300	7060	ug/kg	1	BYT1	11/07/14	2049	1433889	1
Motor Oil (C20–C36)	JT	6040	2300	7060	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	SJW1	11/06/14	1021	1433888

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"	498 ug/kg	706	70.6	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: November 11, 2014

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

Client SDG: XP0160

Client Sample ID: J1VIN8	Project: WCHN00313
Sample ID: 360604004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03–NOV–14 08:48	
Receive Date: 05–NOV–14	
Collector: Client	
Moisture: 10.3%	

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)	T	20000	2410	7410	ug/kg	1	BYT1	11/07/14	2128	1433889	1
Motor Oil (C20–C36)	T	14400	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	SJW1	11/06/14	1021	1433888

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"	529 ug/kg	741	71.5	(50%–150%)

Notes:

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Certificate of Analysis

Report Date: November 11, 2014

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

Client SDG: XP0160

Client Sample ID: J1VIN9	Project: WCHN00313
Sample ID: 360604005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03–NOV–14 08:51	
Receive Date: 05–NOV–14	
Collector: Client	
Moisture: 7.37%	

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)	DT	183000	11700	35900	ug/kg	5	BYT1	11/07/14	2206	1433889	1
Motor Oil (C20–C36)	DT	191000	11700	35900	ug/kg	5					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	SJW1	11/06/14	1021	1433888

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"	599 ug/kg	718	83.5	(50%–150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: November 11, 2014

Page 1 of 1

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

Contact: Joan Kessner

Workorder: 360604

Client SDG: XP0160

Project Description: RC-233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1433889										
QC1203203832	LCS										
Diesel Range Organics (C10-C20)	66600			51300	ug/kg		77	(70%-130%)	BYT1	11/07/14	16
Motor Oil (C20-C36)	66600			64500	ug/kg		96.9	(70%-130%)			
**o-Terphenyl	666			506	ug/kg		76.1	(50%-150%)			
QC1203203831	MB										
Diesel Range Organics (C10-C20)			U	2170	ug/kg					11/07/14	15
Motor Oil (C20-C36)			U	2170	ug/kg						
**o-Terphenyl	667			424	ug/kg		63.6	(50%-150%)			
QC1203203833	360604002 MS										
Diesel Range Organics (C10-C20)	72100	T	36400	121000	ug/kg		118	(70%-130%)		11/07/14	19
Motor Oil (C20-C36)	72100	T	27600	121000	ug/kg		129	(70%-130%)			
**o-Terphenyl	721		563	678	ug/kg		94.1	(50%-150%)			
QC1203203834	360604002 MSD										
Diesel Range Organics (C10-C20)	72300	T	36400	T	74400	ug/kg	47.8*	52.6*	(0%-20%)	11/07/14	20
Motor Oil (C20-C36)	72300	T	27600	T	71900	ug/kg	50.8*	61.2*	(0%-20%)		
**o-Terphenyl	723		563	464	ug/kg		64.2	(50%-150%)			
Batch	1434858										
QC1203206463	LCS										
Diesel Range Organics (C10-C20)	66600			48800	ug/kg		73.4	(70%-130%)	BYT1	11/11/14	12
Motor Oil (C20-C36)	66600			68500	ug/kg		103	(70%-130%)			
**o-Terphenyl	666			511	ug/kg		76.7	(50%-150%)			
QC1203206462	MB										
Diesel Range Organics (C10-C20)			U	2160	ug/kg					11/11/14	11
Motor Oil (C20-C36)			U	2160	ug/kg						

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QC Summary

Workorder: **360604** Client SDG: XP0160 Project Description: RC-233 Soil Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1434858										
**o-Terphenyl	666			278	ug/kg		41.7 *	(50%–150%)			
QC1203206464	360604001 MS										
Diesel Range Organics (C10–C20)	70500	TU	2290 T	43600	ug/kg		61.9 *	(70%–130%)	BYT1	11/11/14	13
Motor Oil (C20–C36)	70500	U	2290	58500	ug/kg		83	(70%–130%)			
**o-Terphenyl	705		399	480	ug/kg		68.1	(50%–150%)			
QC1203206465	360604001 MSD										
Diesel Range Organics (C10–C20)	70500	TU	2290 T	47700	ug/kg	8.96	67.7 *	(0%–20%)		11/11/14	14
Motor Oil (C20–C36)	70500	U	2290	62000	ug/kg	5.76	88	(0%–20%)			
**o-Terphenyl	705		399	518	ug/kg		73.4	(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
- 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: 1433888 **Verified by:** _____
Analyst: Sirena White
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 22
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203203831 MB	06-NOV-2014 10:21:00	30	1	0.03333
1203203832 LCS	06-NOV-2014 10:21:00	30.05	1	0.03328
360604001	06-NOV-2014 10:21:00	30.04	1	0.03329
360604002	06-NOV-2014 10:21:00	30.1	1	0.03322
1203203833 MS (360604002)	06-NOV-2014 10:21:00	30.13	1	0.03319
1203203834 MSD (360604002)	06-NOV-2014 10:21:00	30.04	1	0.03329
360604003	06-NOV-2014 10:21:00	30.07	1	0.03326
360604004	06-NOV-2014 10:21:00	30.1	1	0.03322
360604005	06-NOV-2014 10:21:00	30.09	1	0.03323

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203203832	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	Final Solvent: CH2Cl2 Verified by: MD
MS	1203203833	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	
MSD	1203203834	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	All samples contained soil and rocks.
SURR	All	20 ppm surrogate	WE141001-04	1	mL	
REGNT	All	Methylene Chloride	2174485-D	120	mL	
SOURC	All	SODIUM SULFATE	2168618	30	g	

Prep Logbook

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

Batch ID: 1434857 **Verified by:** _____
Analyst: Sirena White
Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 22
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203206462 MB	10-NOV-2014 10:20:00	30.05	1	0.03328
1203206463 LCS	10-NOV-2014 10:20:00	30.05	1	0.03328
360604001 - 2	10-NOV-2014 10:20:00	30.04	1	0.03329
1203206464 - 2 MS (360604001)	10-NOV-2014 10:20:00	30.02	1	0.03331
1203206465 - 2 MSD (360604001)	10-NOV-2014 10:20:00	30.03	1	0.0333

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203206463	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	Final Solvent: CH2Cl2 Verified by: MD
MS	1203206464	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	
MSD	1203206465	AZDRO SPIKE LCS STD,4000ug/ml	WF1141030-62	1	mL	Sample 360604001 and its MS/MSD contained a mixture of soil and rocks.
SURR	All	20 ppm surrogate	WE141001-04	1	mL	
REGNT	All	Methylene Chloride	2172960-D	120	mL	
SOURC	All	SODIUM SULFATE	2168618	30	g	

PCB Analysis

Case Narrative

**PCB Case Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0160**

Method/Analysis Information

Procedure: Analysis of Polychlorinated Biphenyls by ECD
Analytical Method: SW846 3541/8082A
Prep Method: SW846 3541
Analytical Batch Number: 1433868
Prep Batch Number: 1433864

Sample Analysis

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

Sample ID	Client ID
360604001	J1V1C8
360604002	J1V1C9
360604003	J1V1N7
360604004	J1V1N8
360604005	J1V1N9
1203203774	MB for batch 1433864
1203203775	Laboratory Control Sample (LCS)
1203203776	360604001(J1V1C8) Matrix Spike (MS)
1203203777	360604001(J1V1C8) 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.

One of the five quantified peaks did not meet the acceptance criteria in Aroclor-1016 standard analyzed for this SDG; however, the average concentration of the five quantified peaks met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

Sample 360604005 (J1V1N9) did not meet acceptance criteria for surrogate recovery due to dilution.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 360604001 (J1V1C8) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recoveries for this SDG were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recoveries for this SDG 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

Samples 360604003 (J1V1N7) and 360604005 (J1V1N9) were diluted due to high level of target analytes detected in the samples.

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. DER #1352796 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 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
ECD8A.I_1	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide I)
ECD8A.I_2	Agilent 6890 Gas Chromatograph/Dual ECD w/ 7683 Autosampler	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticide II)

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. 07-NOV-14	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/ECD	Test / Method: SW846 3541/8082A	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1433868	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 360604(XP0160)			
Application Issues: Failed Yield for Surrogates			
Specification and Requirements Exception Description:		DER Disposition:	
Sample 360604005 did not meet the surrogate recovery acceptance criteria.		The sample was diluted at 1:100 due to over range target analytes. The failure was due to dilution. Data was reported.	

Originator's Name:

James Maestas 07-NOV-14

Data Validator/Group Leader:

Yiping Shi 10-NOV-14

GEL LABORATORIES LLC

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Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0160 GEL Work Order: 360604 Project: RC-233 Soil

The Qualifiers in this report are defined as follows:

D Results are reported from a diluted aliquot of sample.

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.

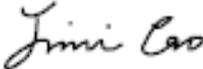
RA Indicates that sample is re-analyzed without re-extraction.

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: 11 NOV 2014

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: November 10, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1C8	Project: WCHN00313
Sample ID: 360604001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03-NOV-14 08:33	
Receive Date: 05-NOV-14	
Collector: Client	
Moisture: 5.49%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"											
Aroclor-1016	U	1.17	1.17	3.52	ug/kg	1	JXM	11/07/14	0740	1433868	1
Aroclor-1221	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1232	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1242	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1248	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1254	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1260	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1262	U	1.17	1.17	3.52	ug/kg	1					
Aroclor-1268	U	1.17	1.17	3.52	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	11/06/14	0947	1433864

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 - 3 day TAT "Dry Weight Corrected"	5.89 ug/kg	7.04	83.7	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	5.72 ug/kg	7.04	81.3	(25%-131%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 10, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1C9	Project: WCHN00313
Sample ID: 360604002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03-NOV-14 08:36	
Receive Date: 05-NOV-14	
Collector: Client	
Moisture: 7.95%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"											
Aroclor-1016	U	1.21	1.21	3.62	ug/kg	1	JXM	11/07/14	0823	1433868	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-1262	U	1.21	1.21	3.62	ug/kg	1					
Aroclor-1268	U	1.21	1.21	3.62	ug/kg	1					
Aroclor-1260		21.2	1.21	3.62	ug/kg	1	JXM	11/07/14	0823	1433868	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	11/06/14	0947	1433864

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 - 3 day TAT "Dry Weight Corrected"	4.85 ug/kg	7.24	67.0	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	5.06 ug/kg	7.24	69.9	(25%-131%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: November 10, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1N7	Project: WCHN00313
Sample ID: 360604003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03-NOV-14 08:44	
Receive Date: 05-NOV-14	
Collector: Client	
Moisture: 5.82%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"											
Aroclor-1016	DU	5.88	5.88	17.6	ug/kg	5	JXM	11/07/14	0838	1433868	1
Aroclor-1221	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1232	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1242	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1248	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1254	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1260	D	100	5.88	17.6	ug/kg	5					
Aroclor-1262	DU	5.88	5.88	17.6	ug/kg	5					
Aroclor-1268	DU	5.88	5.88	17.6	ug/kg	5					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	11/06/14	0947	1433864

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 - 3 day TAT "Dry Weight Corrected"	6.28 ug/kg	7.06	89.0	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	5.66 ug/kg	7.06	80.2	(25%-131%)

Notes:

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Certificate of Analysis

Report Date: November 10, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1N8	Project: WCHN00313
Sample ID: 360604004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03-NOV-14 08:48	
Receive Date: 05-NOV-14	
Collector: Client	
Moisture: 10.3%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"											
Aroclor-1016	U	1.24	1.24	3.71	ug/kg	1	JXM	11/07/14	0852	1433868	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	11/06/14	0947	1433864

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 - 3 day TAT "Dry Weight Corrected"	4.90 ug/kg	7.42	66.0	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	5.10 ug/kg	7.42	68.8	(25%-131%)

Notes:

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Certificate of Analysis

Report Date: November 10, 2014

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

Client SDG: XP0160

Client Sample ID: J1V1N9	Project: WCHN00313
Sample ID: 360604005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 03-NOV-14 08:51	
Receive Date: 05-NOV-14	
Collector: Client	
Moisture: 7.37%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB											
SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"											
Aroclor-1016	DU	119	119	359	ug/kg	100	JXM	11/07/14	0906	1433868	1
Aroclor-1221	DU	119	119	359	ug/kg	100					
Aroclor-1232	DU	119	119	359	ug/kg	100					
Aroclor-1242	DU	119	119	359	ug/kg	100					
Aroclor-1248	DU	119	119	359	ug/kg	100					
Aroclor-1254	DU	119	119	359	ug/kg	100					
Aroclor-1262	DU	119	119	359	ug/kg	100					
Aroclor-1268	DU	119	119	359	ug/kg	100					
Aroclor-1260	D	2050	119	359	ug/kg	100	JXM	11/07/14	0906	1433868	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	MXD2	11/06/14	0947	1433864

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 - 3 day TAT "Dry Weight Corrected"	8.61 ug/kg	7.18	120*	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	7.39 ug/kg	7.18	103	(25%-131%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: November 10, 2014

Page 1 of 2

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

Workorder: 360604

Client SDG: XP0160

Project Description: RC-233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1433868										
QC1203203775	LCS										
Aroclor-1016	33.3			26.5	ug/kg		79.6	(44%-97%)	JXM	11/07/14	07:28
Aroclor-1260	33.3			27.3	ug/kg		82	(49%-109%)			
**4cmx	6.66			5.88	ug/kg		88.3	(29%-106%)			
**Decachlorobiphenyl	6.66			7.15	ug/kg		107	(25%-131%)			
QC1203203774	MB										
Aroclor-1016			U	1.11	ug/kg					11/07/14	07:16
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			5.83	ug/kg		87.6	(29%-106%)			
**Decachlorobiphenyl	6.66			6.85	ug/kg		103	(25%-131%)			
QC1203203776	360604001	MS									
Aroclor-1016	35.2	U	1.17	25.7	ug/kg		72.9	(22%-127%)		11/07/14	07:55
Aroclor-1260	35.2	U	1.17	26.7	ug/kg		75.8	(18%-130%)			
**4cmx	7.04		5.89	6.02	ug/kg		85.4	(29%-106%)			
**Decachlorobiphenyl	7.04		5.72	6.24	ug/kg		88.7	(25%-131%)			

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QC Summary

Workorder: 360604

Client SDG: XP0160

Project Description: RC-233 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-PCB											
Batch	1433868										
QC1203203777	360604001	MSD									
Aroclor-1016	35.2	U	1.17	26.0	ug/kg	1.34	73.8	(0%-30%)	JXM	11/07/14	08:09
Aroclor-1260	35.2	U	1.17	26.1	ug/kg	2.16	74.1	(0%-30%)			
**4cmx	7.05		5.89	6.36	ug/kg		90.2	(29%-106%)			
**Decachlorobiphenyl	7.05		5.72	5.33	ug/kg		75.6	(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: 1433864 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)
1203203774 MB	06-NOV-2014 09:47:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
1203203775 LCS	06-NOV-2014 09:47:00	30.03	H2SO4/KM 2 nO4	9	1	0.0333
360604001	06-NOV-2014 09:47:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
1203203776 MS (360604001)	06-NOV-2014 09:47:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
1203203777 MSD (360604001)	06-NOV-2014 09:47:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
360604002	06-NOV-2014 09:47:00	30.01	H2SO4/KM 2 nO4	9	1	0.03332
360604003	06-NOV-2014 09:47:00	30.09	H2SO4/KM 2 nO4	9	1	0.03323
360604004	06-NOV-2014 09:47:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
360604005	06-NOV-2014 09:47:00	30.09	H2SO4/KM 2 nO4	9	1	0.03323

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203203775	PCB Laboratory Control	WE141103-06	1	mL	Final Solvent: Hexane
MS	1203203776	PCB Laboratory Control	WE141103-06	1	mL	Verified by: SJW
MSD	1203203777	PCB Laboratory Control	WE141103-06	1	mL	Clean-up: H2SO4/KMnO4
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE141016-01	1	mL	Prior to clean-up: 2mL
REGNT	All	Hexane	141024-B10	120	mL	Clean-up initials: MD
REGNT	All	1:1 sulfuric acid	2170235	5	mL	Clean-up SOP: GL-OA-E-037 Rev.1
REGNT	All	5% Potassium Permanganate	2176611	5	mL	Clean-up date: 11/06/14
SOURC	All	SODIUM SULFATE	2168618	30	g	All samples consisted of soil and rocks (small and large).