

**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 9/22/14  
INITIAL/DATE

**COMMENTS:**

**SDG XP0118**

**SAF-RC-233**

Rad only

Chem only

Rad & Chem

Complete

Partial

**REVISED TO INCLUDE DRO ANALYSES**

**Sample Location: 100-B-35, 151-B Electrical switchyard,  
IP, EXC**



September 12, 2014

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

Re: RC-233 Soil  
Work Order: 354539  
SDG: XP0118

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 13, 2014. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. This data package is revised per client to add DRO analyses.

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-233-051  
Enclosures



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# Case Narrative

This data package is revised per client to add DRO analyses.

**Receipt Narrative  
for  
WC-HANFORD, INC.  
SDG: XP0118  
Work Order: 354539**

**September 12, 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 August 13, 2014 for analysis.

**Sample Identification:** The laboratory received the following samples:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
354539001	J1TXJ0
354539002	J1TXJ1
354539003	J1TXJ2
354539004	J1TXJ3

**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**



**SAMPLE RECEIPT & REVIEW FORM**

Client: <b>WCHN</b>		SDG/AR/COC/Work Order: <b>354539</b>
Received By: <b>P. Went</b>		Date Received: <b>8/13/14</b>
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 type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <b>0CPM</b>
Classified Radioactive II or III by RSO?	<input type="checkbox"/>	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	<input type="checkbox"/>	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	<input 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 type="checkbox"/>	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	<input 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 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>			Preservation Method: <u>Ice bags</u> Blue ice Dry ice None Other (describe) <b>2c</b> *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): <b>130462966</b>
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  <b>7708 1755 4967</b> <b>7708 0742 0748</b>

Comments (Use Continuation Form if needed):

# **Laboratory Certifications**

**List of current GEL Certifications as of 12 September 2014**

<b>State</b>	<b>Certification</b>
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	SC000122014-14
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 XP0118**

**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: 1417756  
Prep Batch Number: 1417755

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
354539002	J1TXJ1
354539004	J1TXJ3
1203164009	MB for batch 1417755
1203164010	Laboratory Control Sample (LCS)
1203164013	354539002(J1TXJ1) Matrix Spike (MS)
1203164014	354539002(J1TXJ1) 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; however, the MB contained low level (below the PQL) of hydrocarbons within Motor Oil range.

### **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 354539002 (J1TXJ1) was selected for the matrix spike and matrix spike duplicate analysis.

### **Matrix Spike (MS) Recovery Statement**

The MS, 1203164013 (J1TXJ1), recovered outside the acceptance limits due to sample matrix interference and non-homogenous matrix of the sample.

### **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, 1203164013 (J1TXJ1) and 1203164014 (J1TXJ1), did not meet the acceptance limits due to relatively lower spike recovery in the MS.

## **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. Samples 354539002 (J1TXJ1) and 354539004 (J1TXJ3) were extracted out of holding.

### **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 #1333297 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
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**

<b>Mo.Day Yr.</b> 12-SEP-14	<b>Division:</b> Federal	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> GC/FID	<b>Test / Method:</b> NWTPH-Dx in Soil	<b>Matrix Type:</b> Solid	<b>Client Code:</b> WCHN
<b>Batch ID:</b> 1417756	<b>Sample Numbers:</b> See Below		

**Potentially affected work order(s)(SDG): 354331(XP0116),354539(XP0118),355294(XP0121),356299(XP0129),356303(XP0130)**

**Application Issues:**

- Failed Recovery for MS/PS
- Failed RPD for MS/MSD, or PS/PSD
- Failed Yield for Surrogates
- Failed Recovery for MSD/PSD
- Sample Prepped out of Holding
- Sample Logged out of Holding

<b>Specification and Requirements Exception Description:</b>	<b>DER Disposition:</b>
<ol style="list-style-type: none"> <li>1. Samples 354331002, 354539002, 354539004, 355294004 and 355294005 were extracted out of holding.</li> <li>2. Samples 356299001, 3356303001, 1203164019(MS) and 1203164020(MSD) recovered o-Terphenyl below its established acceptance limit (SPC Limit: 50%-150).</li> <li>3. The MS and MSD, prepared on sample 354331002 did not meet spike recovery acceptance criteria.</li> <li>4. The MS, prepared on sample 354539002 did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either.</li> <li>5. The MS and MSD, prepared on sample 355294004, did not meet spike recovery acceptance criteria.</li> <li>6. The MS, prepared on sample 356299001, did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either.</li> <li>7. The MSD, prepared on sample 356303001, did not meet spike recovery acceptance criteria. The RPD between the MS and MSD did not met the acceptance criteria either.</li> </ol>	<ol style="list-style-type: none"> <li>1. The samples were logged for DRO analysis after the holding time expired. The data were reported with proper qualifier.</li> <li>2. The results of sample 356299001 in this batch are reported as the preliminary results. The final result will be reported when the re-extraction/re-analysis results are available.</li> <li>3. The failure was attributed to sample matrix interference as the MS and MSD failed in the same manner. The data were reported.</li> <li>4. The failure was attributed to sample matrix interference and non-homogenous matrix of the sample as the MS, MSD and the parents sample all met surrogate recovery acceptance. The data were reported.</li> <li>5. As the MS and MSD displayed similar recoveries, the failure was attributed to sample matrix interference and the data were reported.</li> <li>6. The results of sample 356299001 and its MS/MSD in this batch are reported as the preliminary results. The final result will be reported when the re-extraction/re-analysis results are available.</li> <li>7. The failure was attributed to dilution, sample matrix interference and high level of target analytes in the parent sample. The data were reported.</li> </ol>

**Originator's Name:**

Benjamin Taft 12-SEP-14

**Data Validator/Group Leader:**

Jimin Cao 12-SEP-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: XP0118 GEL Work Order: 354539 Project: RC-233 Soil

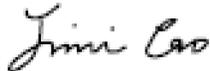
### The Qualifiers in this report are defined as follows:

- B The analyte was detected in both the associated QC blank and in the sample.
- 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.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- 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: 12 SEP 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: September 12, 2014

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

Client SDG: XP0118

Client Sample ID: J1TXJ1  
 Sample ID: 354539002  
 Matrix: SOIL  
 Collect Date: 11–AUG–14 09:27  
 Receive Date: 13–AUG–14  
 Collector: Client  
 Moisture: 5.22%

Project: WCHN00313  
 Client ID: WCHN001

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)	TX	13400	2270	7000	ug/kg	1	BYT1	09/10/14	2149	1417756	1
Motor Oil (C20–C36)	BTX	18900	2270	7000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	09/10/14	0953	1417755

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"	512 ug/kg	700	73.2	(50%–150%)

**Notes:**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: September 12, 2014

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

Client SDG: XP0118

Client Sample ID: J1TXJ3	Project: WCHN00313
Sample ID: 354539004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 11–AUG–14 09:35	
Receive Date: 13–AUG–14	
Collector: Client	
Moisture: 4.04%	

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)	JTX	5360	2250	6940	ug/kg	1	BYT1	09/10/14	2346	1417756	1
Motor Oil (C20–C36)	BTX	23700	2250	6940	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	09/10/14	0953	1417755

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"	440 ug/kg	694	63.5	(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: September 12, 2014

Page 1 of 1

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

**Contact:** Joan Kessner

**Workorder:** 354539

**Client SDG:** XP0118

**Project Description:** RC–233 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Diesel Range Organics</b>											
Batch	1417756										
QC1203164010	LCS										
Diesel Range Organics (C10–C20)	66500			47900	ug/kg		72	(70%–130%)	BYT1	09/11/14	09:00
Motor Oil (C20–C36)	66500		B	53700	ug/kg		80.8	(70%–130%)			
**o–Terphenyl	665			512	ug/kg		77	(50%–150%)			
QC1203164009	MB										
Diesel Range Organics (C10–C20)			U	2160	ug/kg					09/10/14	18:00
Motor Oil (C20–C36)			J	3220	ug/kg						
**o–Terphenyl	666			430	ug/kg		64.6	(50%–150%)			
QC1203164013	354539002 MS										
Diesel Range Organics (C10–C20)	70200	TX	13400	TX	52500	ug/kg	55.7*	(70%–130%)		09/10/14	22:00
Motor Oil (C20–C36)	70200	BTX	18900	BTX	58600	ug/kg	56.5*	(70%–130%)			
**o–Terphenyl	702		512	412	ug/kg		58.7	(50%–150%)			
QC1203164014	354539002 MSD										
Diesel Range Organics (C10–C20)	70200	TX	13400	X	71700	ug/kg	31.0*	83.1	(0%–20%)	09/10/14	23:00
Motor Oil (C20–C36)	70200	BTX	18900	BX	88800	ug/kg	41.0*	99.6	(0%–20%)		
**o–Terphenyl	702		512	562	ug/kg		80.1	(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

# GEL LABORATORIES LLC

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## QC Summary

Workorder: 354539

Client SDG: XP0118

Project Description: RC-233 Soil

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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:** 1417755      **Verified by:** \_\_\_\_\_  
**Analyst:** Mia DeLee  
**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)
1203164009 MB	10-SEP-2014 09:53:00	30.04	1	0.03329
1203164010 LCS	10-SEP-2014 09:53:00	30.07	1	0.03326
354331002	10-SEP-2014 09:53:00	30.08	1	0.03324
1203164011 MS (354331002)	10-SEP-2014 09:53:00	30.07	1	0.03326
1203164012 MSD (354331002)	10-SEP-2014 09:53:00	30.07	1	0.03326
354539002	10-SEP-2014 09:53:00	30.15	1	0.03317
1203164013 MS (354539002)	10-SEP-2014 09:53:00	30.06	1	0.03327
1203164014 MSD (354539002)	10-SEP-2014 09:53:00	30.06	1	0.03327
354539004	10-SEP-2014 09:53:00	30.04	1	0.03329
355294004	10-SEP-2014 09:53:00	30.23	1	0.03308
1203164015 MS (355294004)	10-SEP-2014 09:53:00	30.05	1	0.03328
1203164016 MSD (355294004)	10-SEP-2014 09:53:00	30.07	1	0.03326
355294005	10-SEP-2014 09:53:00	30.4	1	0.03289
356299001	10-SEP-2014 09:53:00	30.35	1	0.03295
1203164017 MS (356299001)	10-SEP-2014 09:53:00	30.38	1	0.03292
1203164018 MSD (356299001)	10-SEP-2014 09:53:00	30.39	1	0.03291
356299002	10-SEP-2014 09:53:00	30.09	1	0.03323
356299003	10-SEP-2014 09:53:00	30.26	1	0.03305
356299004	10-SEP-2014 09:53:00	30.22	1	0.03309
356299005	10-SEP-2014 09:53:00	30.25	1	0.03306
356303001	10-SEP-2014 09:53:00	30.33	1	0.03297
1203164019 MS (356303001)	10-SEP-2014 09:53:00	30.08	1	0.03324
1203164020 MSD (356303001)	10-SEP-2014 09:53:00	30.31	1	0.03299
356303002	10-SEP-2014 09:53:00	30.19	1	0.03312
356303003	10-SEP-2014 09:53:00	30.33	1	0.03297
356303004	10-SEP-2014 09:53:00	30.14	1	0.03318

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203164010	AZDRO SPIKE LCS STD,4000ug/ml	WF1140806-62	1	mL	Final Solvent: CH2Cl2

# Prep Logbook

**Batch ID:** 1417755      **Verified by:** \_\_\_\_\_  
**Analyst:** Mia DeLee  
**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)	
MS	1203164011	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164013	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164015	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164017	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MS	1203164019	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164012	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164014	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164016	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164018	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
MSD	1203164020	AZDRO SPIKE LCS STD,4000ug/ml		WF1140806-62	1 mL
SURR	All	20 ppm surrogate		WE140819-04	1 mL
REGNT	All	Methylene Chloride		2149119-D	120 mL
SOURC	All	SODIUM SULFATE		2127169	30 g

Verified by: SG

Samples consisted of a mixture of soil and rocks (large and small)

# PCB Analysis

# Case Narrative

**PCB Case Narrative  
WC-HANFORD, INC. (WCHN)  
SDG XP0118**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD  
Analytical Method: SW846 3541/8082A  
Prep Method: SW846 3541  
Analytical Batch Number: 1411146  
Prep Batch Number: 1411145

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
354539001	J1TXJ0
354539002	J1TXJ1
354539003	J1TXJ2
1203147201	MB for batch 1411145
1203147202	Laboratory Control Sample (LCS)
1203147203	354539001(J1TXJ0) Matrix Spike (MS)
1203147204	354539001(J1TXJ0) 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**

Matrix QC sample 1203147204 (J1TXJ0)(MSD) did not meet the surrogate recovery acceptance criteria. This non-compliance had no adverse effects on the data as the MSD met spike recovery acceptance criteria.

#### **Laboratory Control Sample (LCS) Recovery**

The LCS spike recoveries met the acceptance limits.

#### **QC Sample Designation**

Sample 354539001 (J1TXJ0) 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 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. 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 did not require dilutions.

#### **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**

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 #1325197 was generated for 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
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

**Method/Analysis Information**

**Procedure: Analysis of Polychlorinated Biphenyls by ECD**

Analytical Method: SW846 3541/8082A

Prep Method: SW846 3541

Analytical Batch Number: 1411452

Prep Batch Number: 1411449

**Sample Analysis**

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

<b>Sample ID</b>	<b>Client ID</b>
354539004	J1TXJ3
1203147961	MB for batch 1411449
1203147962	Laboratory Control Sample (LCS)
1203148088	354539004(J1TXJ3) Matrix Spike (MS)
1203148089	354539004(J1TXJ3) 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 354539004 (J1TXJ3) was selected for the matrix spike and matrix spike duplicate analysis.

#### **Matrix Spike (MS) Recovery Statement**

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

#### **Matrix Spike Duplicate (MSD) Recovery Statement**

The MSD recoveries for this SDG in this batch were within the established acceptance limits.

#### **MS/MSD Relative Percent Difference (RPD) Statement**

The RPD between the MS and MSD was within the established acceptance limits for this SDG in this batch.

### **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 did not require dilutions.

#### **Sample Re-extraction/Re-analysis**

Sample 354539004 (J1TXJ3) was extracted and analyzed twice due to quality issue in the first analysis. The second analysis was reported.

### **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 back column has been chosen as the primary column. The data are reported from the back column for all samples in this batch.

Due to software issue, the surrogate recovery range was not indicated 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:

<b>Instrument ID</b>	<b>Instrument</b>	<b>System Configuration</b>	<b>Column ID</b>	<b>Column Description</b>
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

**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**

<b>Mo.Day Yr.</b> 18-AUG-14	<b>Division:</b> Federal	<b>Quality Criteria:</b> SOP	<b>Type:</b> Process
<b>Instrument Type:</b> GC/ECD	<b>Test / Method:</b> SW846 3541/8082A	<b>Matrix Type:</b> Solid	<b>Client Code:</b> XP0118
<b>Batch ID:</b> 1411146	<b>Sample Numbers:</b> See below		
<p><b>Potentially affected work order(s)(SDG): 354539(XP0118)</b></p> <p><b>Application Issues:</b> Failed RPD for MS/MSD, or PS/PSD Failed Recovery for MSD/PSD</p>			
<b>Specification and Requirements Exception Description:</b>		<b>DER Disposition:</b>	
<p>1. Matrix QC sample 1203147204(MSD) did not meet surrogate recovery acceptance criteria.</p> <p>2. The RPD between the 1203147203(MS) and 1203147204MSD did not meet the acceptance criteria.</p>		<p>1. Matrix QC sample 1203147204(MSD) recovered below the acceptance limits for surrogate 4cmx. This non-compliance had no adverse effects on the data as the MSD met spike recovery acceptance criteria.</p> <p>2. The failure was due to relatively lower spike recovery in the MSD. Both MS and MSD met spike recovery acceptance criteria. The data were reported.</p>	

**Originator's Name:**

Jimin Cao 18-AUG-14

**Data Validator/Group Leader:**

Cameron Bearden 18-AUG-14

## GEL LABORATORIES LLC

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### Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0118 GEL Work Order: 354539 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

P Aroclor target analyte with greater than 25% difference between column analyses.

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.

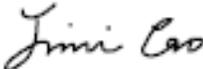
RA Indicates that sample is re-analyzed without re-extraction.

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: 18 AUG 2014

Title: Data Validator

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: August 15, 2014

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

Client SDG: XP0118

Client Sample ID: J1TXJ0	Project: WCHN00313
Sample ID: 354539001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 11-AUG-14 09:23	
Receive Date: 13-AUG-14	
Collector: Client	
Moisture: 1.76%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatiles-PCB</b>											
<b>SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"</b>											
Aroclor-1016	U	1.13	1.13	3.39	ug/kg	1	YS1	08/13/14	1912	1411146	1
Aroclor-1221	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1232	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1242	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1248	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1260	J	2.71	1.13	3.39	ug/kg	1					
Aroclor-1262	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1268	U	1.13	1.13	3.39	ug/kg	1					
Aroclor-1254	J	2.08	1.13	3.39	ug/kg	1	YS1	08/13/14	1912	1411146	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	SJW1	08/13/14	1255	1411145

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"	4.37 ug/kg	6.77	64.5	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.39 ug/kg	6.77	79.6	(35%-119%)

**Notes:**



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## Certificate of Analysis

Report Date: August 15, 2014

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

Client SDG: XP0118

Client Sample ID: J1TXJ2	Project: WCHN00313
Sample ID: 354539003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 11-AUG-14 09:31	
Receive Date: 13-AUG-14	
Collector: Client	
Moisture: 5.24%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatiles-PCB</b>											
<b>SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"</b>											
Aroclor-1016	U	1.17	1.17	3.50	ug/kg	1	YS1	08/13/14	1957	1411146	1
Aroclor-1221	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1232	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1242	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1248	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1254	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1260	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1262	U	1.17	1.17	3.50	ug/kg	1					
Aroclor-1268	U	1.17	1.17	3.50	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	SJW1	08/13/14	1255	1411145

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"	4.66 ug/kg	7.01	66.5	(44%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB Solid Automated Soxhlet "Dry Weight Corrected"	5.49 ug/kg	7.01	78.3	(35%-119%)

**Notes:**



# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: August 15, 2014

Page 1 of 4

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

**Workorder: 354539**

**Client SDG: XP0118**

**Project Description: RC-233 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatiles-PCB</b>											
Batch	1411146										
QC1203147202	LCS										
Aroclor-1016	33.3			25.5	ug/kg		76.7	(39%-120%)	YS1	08/13/14	19:00
Aroclor-1260	33.3			29.6	ug/kg		88.9	(50%-116%)			
**4cmx	6.66			4.73	ug/kg		71.1	(44%-106%)			
**Decachlorobiphenyl	6.66			5.47	ug/kg		82.1	(35%-119%)			
QC1203147201	MB										
Aroclor-1016			U	1.11	ug/kg					08/13/14	18:49
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	6.67			4.72	ug/kg		70.8	(44%-106%)			
**Decachlorobiphenyl	6.67			5.35	ug/kg		80.3	(35%-119%)			
QC1203147203	354539001	MS									
Aroclor-1016	33.9	U	1.13	22.7	ug/kg		66.9	(25%-125%)		08/13/14	19:23
Aroclor-1260	33.9	J	2.71	29.3	ug/kg		78.4	(28%-127%)			
**4cmx	6.78		4.37	4.40	ug/kg		64.9	(44%-106%)			
**Decachlorobiphenyl	6.78		5.39	5.20	ug/kg		76.7	(35%-119%)			

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## QC Summary

Workorder: 354539

Client SDG: XP0118

Project Description: RC-233 Soil

Page 2 of 4

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatiles-PCB</b>											
Batch	1411146										
QC1203147204	354539001	MSD									
Aroclor-1016	33.9	U	1.13	16.1	ug/kg	34.1*	47.4	(0%-30%)	YS1	08/13/14	19:34
Aroclor-1260	33.9	J	2.71	21.9	ug/kg	29.0	56.5	(0%-30%)			
**4cmx	6.78		4.37	2.67	ug/kg		39.4*	(44%-106%)			
**Decachlorobiphenyl	6.78		5.39	3.66	ug/kg		54	(35%-119%)			
Batch	1411452										
QC1203147962	LCS										
Aroclor-1016	33.3			24.2	ug/kg		72.6	(39%-120%)	YS1	08/14/14	18:17
Aroclor-1260	33.3			29.0	ug/kg		87.1	(50%-116%)			
**4cmx	6.67			5.05	ug/kg		75.8	(44%-106%)			
**Decachlorobiphenyl	6.67			5.68	ug/kg		85.3	(35%-119%)			
QC1203147961	MB										
Aroclor-1016			U	1.11	ug/kg					08/14/14	18:06
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			5.34	ug/kg		80.2	(44%-106%)			
**Decachlorobiphenyl	6.66			5.91	ug/kg		88.8	(35%-119%)			
QC1203148088	354539004	MS									

# GEL LABORATORIES LLC

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

## QC Summary

Workorder: 354539

Client SDG: XP0118

Project Description: RC-233 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatiles-PCB</b>											
Batch	1411452										
Aroclor-1016	34.7	U	1.16	25.8	ug/kg		74.5	(25%-125%)		08/14/14	18:40
Aroclor-1260	34.7		28.6	52.4	ug/kg		68.4	(28%-127%)	YS1		
**4cmx	6.94		5.36	5.40	ug/kg		77.8	(44%-106%)			
**Decachlorobiphenyl	6.94		5.54	5.41	ug/kg		78	(35%-119%)			
QC1203148089 354539004 MSD											
Aroclor-1016	34.6	U	1.16	25.4	ug/kg	1.64	73.4	(0%-30%)		08/14/14	18:53
Aroclor-1260	34.6		28.6	61.9	ug/kg	16.7	96	(0%-30%)			
**4cmx	6.93		5.36	5.07	ug/kg		73.1	(44%-106%)			
**Decachlorobiphenyl	6.93		5.54	5.39	ug/kg		77.9	(35%-119%)			

**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)

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## QC Summary

Workorder: 354539

Client SDG: XP0118

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<u>Parmname</u>	<u>NOM</u>	<u>Sample Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
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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: 1411145      Verified by: \_\_\_\_\_  
 Analyst: Sirena White  
 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)
1203147201 MB	13-AUG-2014 12:55:00	30	H2SO4/KM 2 nO4	9	1	0.03333
1203147202 LCS	13-AUG-2014 12:55:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
354539001	13-AUG-2014 12:55:00	30.06	H2SO4/KM 2 nO4	9	1	0.03327
1203147203 MS (354539001)	13-AUG-2014 12:55:00	30.03	H2SO4/KM 2 nO4	9	1	0.0333
1203147204 MSD (354539001)	13-AUG-2014 12:55:00	30.04	H2SO4/KM 2 nO4	9	1	0.03329
354539002	13-AUG-2014 12:55:00	30.11	H2SO4/KM 2 nO4	9	1	0.03321
354539003	13-AUG-2014 12:55:00	30.12	H2SO4/KM 2 nO4	9	1	0.0332
354539004	13-AUG-2014 12:55:00	30.14	H2SO4/KM 2 nO4	9	1	0.03318
354541001	13-AUG-2014 12:55:00	30.1	H2SO4/KM 2 nO4	9	1	0.03322
1203147239 MS (354541001)	13-AUG-2014 12:55:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
1203147240 MSD (354541001)	13-AUG-2014 12:55:00	30.11	H2SO4/KM 2 nO4	9	1	0.03321
354541002	13-AUG-2014 12:55:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
354541003	13-AUG-2014 12:55:00	30	H2SO4/KM 2 nO4	9	1	0.03333
354541004	13-AUG-2014 12:55:00	30.09	H2SO4/KM 2 nO4	9	1	0.03323
354541005	13-AUG-2014 12:55:00	30	H2SO4/KM 2 nO4	9	1	0.03333

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203147202	PCB Laboratory Control	WE140714-10	1	mL	Final Solvent: Hexane
MS	1203147203	PCB Laboratory Control	WE140714-10	1	mL	Verified by: MD
MS	1203147239	PCB Laboratory Control	WE140714-10	1	mL	Clean-up: H2SO4/KMnO4
MSD	1203147204	PCB Laboratory Control	WE140714-10	1	mL	Prior to clean-up: 2mL
MSD	1203147240	PCB Laboratory Control	WE140714-10	1	mL	Clean-up initials: SJW
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE140516-01	1	mL	Clean-up SOP: GL-OA-E-037 Rev.1
REGNT	All	1:1 sulfuric acid	2130267	5	mL	Clean-up date: 08/13/14
REGNT	All	Hexane	2134327-B10	120	mL	
REGNT	All	5% Potassium Permanganate	2134734	5	mL	
SOURC	All	SODIUM SULFATE	2127169	30	g	

# Prep Logbook

## Automated Soxhlet Extraction

Batch ID: 1411449      Verified by: \_\_\_\_\_  
 Analyst: Sirena White  
 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)
1203147961 MB	14-AUG-2014 10:30:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
1203147962 LCS	14-AUG-2014 10:30:00	30	H2SO4/KM 2 nO4	9	1	0.03333
354539004 - 2	14-AUG-2014 10:30:00	30.03	H2SO4/KM 2 nO4	9	1	0.0333
1203148088 - 2 MS (354539004)	14-AUG-2014 10:30:00	30.03	H2SO4/KM 2 nO4	9	1	0.0333
1203148089 - 2 MSD (354539004)	14-AUG-2014 10:30:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
354541001 - 2	14-AUG-2014 10:30:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
354565002	14-AUG-2014 10:30:00	10.376	H2SO4/KM 2 nO4	9	1	0.09638
354566001	14-AUG-2014 10:30:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
1203147963 MS (354566001)	14-AUG-2014 10:30:00	30.01	H2SO4/KM 2 nO4	9	1	0.03332
1203147964 MSD (354566001)	14-AUG-2014 10:30:00	30.08	H2SO4/KM 2 nO4	9	1	0.03324
354568002	14-AUG-2014 10:30:00	10.302	H2SO4/KM 2 nO4	9	1	0.09707
354578002	14-AUG-2014 10:30:00	10.159	H2SO4/KM 2 nO4	9	1	0.09843
354580002	14-AUG-2014 10:30:00	10.082	H2SO4/KM 2 nO4	9	1	0.09919
354646001	14-AUG-2014 10:30:00	10.17	H2SO4/KM 2 nO4	9	1	0.09833
354646002	14-AUG-2014 10:30:00	10.07	H2SO4/KM 2 nO4	9	1	0.0993

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203147962	PCB Laboratory Control	WE140714-10	1	mL	Final Solvent: Hexane Verified by: MD Clean-up Initials: SJW Clean-up SOP: GL-OA-E_037 REV.1 Clean-up date: 08/14/2014
MS	1203147963	PCB Laboratory Control	WE140714-10	1	mL	
MS	1203148088	PCB Laboratory Control	WE140714-10	1	mL	
MSD	1203147964	PCB Laboratory Control	WE140714-10	1	mL	
MSD	1203148089	PCB Laboratory Control	WE140714-10	1	mL	
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L	WE140812-01	1	mL	Samples 354646001 and 354646002 consist of very lightweight material only 10g was able to be aliquoted for each sample.
REGNT	All	Hexane	2126073-B10	120	mL	
REGNT	All	1:1 sulfuric acid	2130267	5	mL	Samples 354539004 and its MS/MSD, 354541001, and 354566001 contained soil and rocks.
REGNT	All	5% Potassium Permanganate	2134734	5	mL	
SOURC	All	SODIUM SULFATE	2127169	30	g	

# Prep Logbook

Batch ID: 1411449  
Analyst: Sirena White  
Method: SW846 3541

Verified by: \_\_\_\_\_

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

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Sample ID	Run Date	Aliquot (g)	Clean Up 1	Clean Up Amount 1 (mL)	Post Clean Up Amount 1 (mL)	Final Volume (mL)	Prepped Factor (mL/g)
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