

**SAF-RC-074**  
**100-D/DR Burial Grounds & Remaining**  
**Sites – Soil In-Process**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

Kathy Wendt

H4-21

KW 10/22/14  
INITIAL/DATE

**COMMENTS:**

**SDG XP0144**

**SAF RC-074**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 100-D-75:1, 151-D, Primary Electrical  
substation**



October 14, 2014

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

Re: RC-074 Soil  
Work Order: 358636  
SDG: XP0144

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 09, 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-074-683  
Enclosures



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# Case Narrative

**Receipt Narrative  
for  
WC-HANFORD, INC.  
SDG: XP0144  
Work Order: 358636**

**October 14, 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 October 09, 2014 for analysis.

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

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
358636001	J1V100
358636002	J1V101

**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: <u>WCHN</u>		SDG/AR/COC/Work Order: <u>358636</u>	
Received By: <u>P. Went</u>		Date Received: <u>10/9/14</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?			<input checked="" type="checkbox"/>
Classified Radioactive II or III by RSO?			<input checked="" type="checkbox"/>
COC/Samples marked containing PCBs?			<input checked="" type="checkbox"/>
Package, COC, and/or Samples marked as beryllium or asbestos containing?			<input checked="" type="checkbox"/>
Shipped as a DOT Hazardous?			<input checked="" type="checkbox"/>
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> <u>Blue ice</u> <u>Dry ice</u> <u>None</u> Other (describe) *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>7714</u> <u>3021</u> <u>0127-2c</u>

Comments (Use Continuation Form if needed):

# **Laboratory Certifications**

**List of current GEL Certifications as of 14 October 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 XP0144**

**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: 1426146  
Prep Batch Number: 1426145

**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>
358636001	J1V100
358636002	J1V101
1203184705	MB for batch 1426145
1203184706	Laboratory Control Sample (LCS)
1203184707	358636002(J1V101) Matrix Spike (MS)
1203184708	358636002(J1V101) 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**

Sample 358636001 (J1V100) failed to meet surrogate recovery acceptance criteria due to dilution.

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

The LCS spike recoveries met the acceptance limits.

### **QC Sample Designation**

Sample 358636002 (J1V101) 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**

QC sample 1203184708 (J1V101)(MSD) recovered slightly below the acceptance limits due to extraction efficiency issue.

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

The MS and MSD, performed on sample 358636002 (J1V101) did not meet RPD acceptance requirement due to relatively lower spike recovery in the MSD

## **Technical Information**

### **Holding Time Specifications**

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

### **Preparation/Analytical Method Verification**

All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

### **Sample Dilutions**

Sample 358636001 (J1V100) was diluted due to the presence of over-range target analytes.

### **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 #1343059 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> 13-OCT-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, SW846 3541/8015B	<b>Matrix Type:</b> Solid	<b>Client Code:</b> DMAX, WCHN
<b>Batch ID:</b> 1426146	<b>Sample Numbers:</b> See Below		

**Potentially affected work order(s)(SDG): 358549,358636(XP0144),358640(XP0145)**

**Application Issues:**

- Failed Recovery for MS/PS
- Failed RPD for MS/MSD, or PS/PSD
- Failed Yield for Surrogates
- Failed Recovery for MSD/PSD

**Specification and Requirements  
Exception Description:**

1. Samples 358549001, -002, -003, -004, and 358636001 did not meet surrogate recovery acceptance limits. Please see the data report for specific failures.
2. The MSD(1203184708), MS(1203184709) and MSD(1203184710) did not meet spike recovery acceptance limits for diesel range organics.
3. The MS(1203184707)/MSD(1203184708) RPD value for diesel range organics and motor oil was not within the acceptance limits.

**DER Disposition:**

1. Samples were diluted due to over-range target analyte. As a result, the surrogates were diluted out of the acceptance limits. Data were reported.
- 2., 3. 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      13-OCT-14

**Data Validator/Group Leader:**

Cameron Bearden      13-OCT-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: XP0144 GEL Work Order: 358636 Project: RC-074 Soil

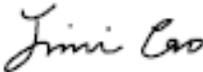
#### The Qualifiers in this report are defined as follows:

- 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: 17 OCT 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: October 13, 2014

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-074 Soil

Client SDG: XP0144

Client Sample ID: J1V100      Project: WCHN00716  
 Sample ID: 358636001      Client ID: WCHN001  
 Matrix: Soil  
 Collect Date: 07-OCT-14 11:23  
 Receive Date: 09-OCT-14  
 Collector: Client  
 Moisture: 3.42%

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	4160000	112000	344000	ug/kg	50	BYT1	10/11/14	0741	1426146	1
Motor Oil (C20-C36)	D	1410000	112000	344000	ug/kg	50					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	10/10/14	0955	1426145

The following Analytical Methods were performed:

Method	Description	Analyst	Result	Nominal	Recovery%	Acceptable Limits
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"		0.00 ug/kg	688	0.00*	(50%-150%)

**Notes:**

# GEL LABORATORIES LLC

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

## Certificate of Analysis

Report Date: October 13, 2014

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-074 Soil

Client SDG: XP0144

Client Sample ID: J1V101	Project: WCHN00716
Sample ID: 358636002	Client ID: WCHN001
Matrix: Soil	
Collect Date: 07-OCT-14 11:28	
Receive Date: 09-OCT-14	
Collector: Client	
Moisture: 1.21%	

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	5920	2190	6740	ug/kg	1	BYT1	10/11/14	0820	1426146	1
Motor Oil (C20-C36)	J	4210	2190	6740	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	10/10/14	0955	1426145

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"	468 ug/kg	674	69.4	(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: October 13, 2014

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

**Workorder: 358636**      **Client SDG: XP0144**      **Project Description: RC-074 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Diesel Range Organics</b>											
Batch	1426146										
QC1203184706	LCS										
Diesel Range Organics (C10-C20)	66600			51000	ug/kg		76.6	(57%-116%)	BYT1	10/11/14	07:02
Motor Oil (C20-C36)	66600			63900	ug/kg		96	(52%-122%)			
**o-Terphenyl	666			532	ug/kg		79.9	(37%-120%)			
QC1203184705	MB										
Diesel Range Organics (C10-C20)			U	2170	ug/kg					10/11/14	06:23
Motor Oil (C20-C36)			U	2170	ug/kg						
**o-Terphenyl	667			470	ug/kg		70.4	(37%-120%)			
QC1203184707	358636002 MS										
Diesel Range Organics (C10-C20)	67400	JT	5920	66700	ug/kg		90.3	(70%-130%)		10/11/14	08:58
Motor Oil (C20-C36)	67400	J	4210	77800	ug/kg		109	(70%-130%)			
**o-Terphenyl	674		468	639	ug/kg		94.8	(50%-150%)			
QC1203184708	358636002 MSD										
Diesel Range Organics (C10-C20)	67500	JT	5920	T	51200	ug/kg	26.4*	67*	(0%-20%)	10/11/14	09:37
Motor Oil (C20-C36)	67500	J	4210		60100	ug/kg	25.7*	82.8	(0%-20%)		
**o-Terphenyl	675		468		498	ug/kg		73.8	(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: 358636

Client SDG: XP0144

Project Description: RC-074 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: 1426145      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)
1203184705 MB	10-OCT-2014 09:55:00	30	1	0.03333
1203184706 LCS	10-OCT-2014 09:55:00	30.05	1	0.03328
358549001	10-OCT-2014 09:55:00	30.16	12.75	0.42275
358549002	10-OCT-2014 09:55:00	30.06	44	1.46374
358549003	10-OCT-2014 09:55:00	30.57	21	0.68695
358549004	10-OCT-2014 09:55:00	30.35	20	0.65898
358636001	10-OCT-2014 09:55:00	30.08	1	0.03324
358636002	10-OCT-2014 09:55:00	30.05	1	0.03328
1203184707 MS (358636002)	10-OCT-2014 09:55:00	30.05	1	0.03328
1203184708 MSD (358636002)	10-OCT-2014 09:55:00	30	1	0.03333
358640001	10-OCT-2014 09:55:00	30.08	1	0.03324
358640002	10-OCT-2014 09:55:00	30	1	0.03333
1203184709 MS (358640002)	10-OCT-2014 09:55:00	30	1	0.03333
1203184710 MSD (358640002)	10-OCT-2014 09:55:00	30.1	1	0.03322
358640003	10-OCT-2014 09:55:00	30.05	1	0.03328
358640004	10-OCT-2014 09:55:00	30.24	1	0.03307
358640005	10-OCT-2014 09:55:00	30.14	1	0.03318
358640006	10-OCT-2014 09:55:00	30.07	1	0.03326

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203184706	AZDRO SPIKE LCS STD,4000ug/ml	WFI141003-62	1	mL	Final Solvent: CH2CL2 Verified by: SJW
MS	1203184707	AZDRO SPIKE LCS STD,4000ug/ml	WFI141003-62	1	mL	
MS	1203184709	AZDRO SPIKE LCS STD,4000ug/ml	WFI141003-62	1	mL	Samples 358549001 - 49004 became thick and oily while concentrating on the TurboVap and they did not concentrate to 1mL; their final volumes are recorded above.
MSD	1203184708	AZDRO SPIKE LCS STD,4000ug/ml	WFI141003-62	1	mL	
MSD	1203184710	AZDRO SPIKE LCS STD,4000ug/ml	WFI141003-62	1	mL	
SURR	All	20 ppm surrogate	WE141001-04	1	mL	
REGNT	All	Methylene Chloride	2165776-D	120	mL	
SOURC	All	SODIUM SULFATE	2148821	30	g	

# PCB Analysis

# Case Narrative

**PCB Case Narrative  
WC-HANFORD, INC. (WCHN)  
SDG XP0144**

**Method/Analysis Information**

**Procedure:** Analysis of Polychlorinated Biphenyls by ECD  
Analytical Method: SW846 3541/8082A  
Prep Method: SW846 3541  
Analytical Batch Number: 1426143  
Prep Batch Number: 1426142

**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>
358636001	J1V100
358636002	J1V101
1203184694	MB for batch 1426142
1203184695	Laboratory Control Sample (LCS)
1203184696	358636001(J1V100) Matrix Spike (MS)
1203184697	358636001(J1V100) 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 for the target analytes. 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 358636001 (J1V100) 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 1203184696 (J1V100MS), 1203184697 (J1V100MSD) and 358636001 (J1V100) were diluted prior to analysis due to the oily matrix of the extracts.

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

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

## **Miscellaneous Information**

### **Electronic Package Comment**

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

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

written pages, will be scanned and inserted into the electronic package.

### **Data Exception (DER) Documentation**

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

### **Manual Integrations**

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

### **Additional Comments**

The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The following additional comments were required:

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

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

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

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

### **System Configuration**

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

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

## GEL LABORATORIES LLC

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### Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0144 GEL Work Order: 358636 Project: RC-074 Soil

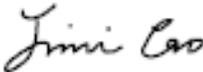
#### The Qualifiers in this report are defined as follows:

- 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
- 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: 17 OCT 2014

Title: Data Validator

# **Sample Data Summary**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: October 14, 2014

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-074 Soil

Client SDG: XP0144

Client Sample ID: J1V100	Project: WCHN00716
Sample ID: 358636001	Client ID: WCHN001
Matrix: Soil	
Collect Date: 07-OCT-14 11:23	
Receive Date: 09-OCT-14	
Collector: Client	
Moisture: 3.42%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatiles-PCB</b>											
<b>SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"</b>											
Aroclor-1016	DU	11.5	11.5	34.5	ug/kg	10	JXM	10/11/14	0910	1426143	1
Aroclor-1221	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1232	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1242	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1248	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1254	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1260	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1262	DU	11.5	11.5	34.5	ug/kg	10					
Aroclor-1268	DU	11.5	11.5	34.5	ug/kg	10					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	SXW3	10/10/14	1740	1426142

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"	3.07 ug/kg	6.90	44.5	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	3.81 ug/kg	6.90	55.2	(25%-131%)

**Notes:**

# GEL LABORATORIES LLC

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## Certificate of Analysis

Report Date: October 14, 2014

Company : WC-Hanford, Inc.  
 Address : 2620 Fermi Avenue  
 MSIN H4-21  
 Richland, Washington 99354  
 Contact: Joan Kessner  
 Project: RC-074 Soil

Client SDG: XP0144

Client Sample ID: J1V101	Project: WCHN00716
Sample ID: 358636002	Client ID: WCHN001
Matrix: Soil	
Collect Date: 07-OCT-14 11:28	
Receive Date: 09-OCT-14	
Collector: Client	
Moisture: 1.21%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
<b>Semi-Volatiles-PCB</b>											
<b>SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"</b>											
Aroclor-1016	U	1.12	1.12	3.37	ug/kg	1	JXM	10/11/14	0954	1426143	1
Aroclor-1221	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1232	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1242	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1248	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1254	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1260	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1262	U	1.12	1.12	3.37	ug/kg	1					
Aroclor-1268	U	1.12	1.12	3.37	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 PCB Prep Soil	SXW3	10/10/14	1740	1426142

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	3.79 ug/kg	6.74	56.3	(29%-106%)
Decachlorobiphenyl	SW846 3541/8082A PCB - 3 day TAT "Dry Weight Corrected"	4.16 ug/kg	6.74	61.8	(25%-131%)

**Notes:**

# **Quality Control Summary**

# GEL LABORATORIES LLC

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## QC Summary

Report Date: October 14, 2014

Page 1 of 2

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

**Workorder: 358636**

**Client SDG: XP0144**

**Project Description: RC-074 Soil**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatiles-PCB</b>											
Batch	1426143										
QC1203184695	LCS										
Aroclor-1016	33.3			23.7	ug/kg		71.1	(44%-97%)	JXM	10/11/14	08:44
Aroclor-1260	33.3			22.7	ug/kg		68	(49%-109%)			
**4cmx	6.66			4.81	ug/kg		72.2	(29%-106%)			
**Decachlorobiphenyl	6.66			5.94	ug/kg		89.1	(25%-131%)			
QC1203184694	MB										
Aroclor-1016			U	1.11	ug/kg					10/11/14	08:32
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			5.32	ug/kg		79.9	(29%-106%)			
**Decachlorobiphenyl	6.66			5.94	ug/kg		89.2	(25%-131%)			
QC1203184696	358636001	MS									
Aroclor-1016	34.5	DU	11.5	DJ	17.3	ug/kg	50.2	(22%-127%)		10/11/14	09:25
Aroclor-1260	34.5	DU	11.5	DJ	16.8	ug/kg	48.7	(18%-130%)			
**4cmx	6.89		3.07		3.79	ug/kg	55	(29%-106%)			
**Decachlorobiphenyl	6.89		3.81		4.49	ug/kg	65.2	(25%-131%)			

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## QC Summary

Workorder: 358636

Client SDG: XP0144

Project Description: RC-074 Soil

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Semi-Volatiles-PCB</b>											
Batch	1426143										
QC1203184697	358636001	MSD									
Aroclor-1016	34.5	DU	11.5	DJP	17.1	ug/kg	1.16	49.6	(0%-30%)	JXM	10/11/14 09:39
Aroclor-1260	34.5	DU	11.5	DJ	16.5	ug/kg	1.51	47.9	(0%-30%)		
**4cmx	6.90		3.07		3.31	ug/kg		47.9	(29%-106%)		
**Decachlorobiphenyl	6.90		3.81		4.00	ug/kg		58	(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: 1426142      Verified by: \_\_\_\_\_  
 Analyst: Shannon Whitehead  
 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)
1203184694 MB	10-OCT-2014 17:40:00	30.01	H2SO4/KM 2 nO4	9	1	0.03332
1203184695 LCS	10-OCT-2014 17:40:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
358596001	10-OCT-2014 17:40:00	10.03	H2SO4/KM 2 nO4	9	1	0.0997
358636001	10-OCT-2014 17:40:00	30.01	H2SO4/KM 2 nO4	9	1	0.03332
1203184696 MS (358636001)	10-OCT-2014 17:40:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
1203184697 MSD (358636001)	10-OCT-2014 17:40:00	30	H2SO4/KM 2 nO4	9	1	0.03333
358636002	10-OCT-2014 17:40:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
358640001	10-OCT-2014 17:40:00	30	H2SO4/KM 2 nO4	9	1	0.03333
1203184698 MS (358640001)	10-OCT-2014 17:40:00	30.04	H2SO4/KM 2 nO4	9	1	0.03329
1203184699 MSD (358640001)	10-OCT-2014 17:40:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
358640002	10-OCT-2014 17:40:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
358640003	10-OCT-2014 17:40:00	30	H2SO4/KM 2 nO4	9	1	0.03333
358640004	10-OCT-2014 17:40:00	30.05	H2SO4/KM 2 nO4	9	1	0.03328
358640005	10-OCT-2014 17:40:00	30.06	H2SO4/KM 2 nO4	9	1	0.03327
358640006	10-OCT-2014 17:40:00	30.04	H2SO4/KM 2 nO4	9	1	0.03329
358672001	10-OCT-2014 17:40:00	10.3	H2SO4/KM 2 nO4	9	1	0.09709
358789001	10-OCT-2014 17:40:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331
358789002	10-OCT-2014 17:40:00	30.03	H2SO4/KM 2 nO4	9	1	0.0333
1203185541 MS (358789002)	10-OCT-2014 17:40:00	30	H2SO4/KM 2 nO4	9	1	0.03333
1203185542 MSD (358789002)	10-OCT-2014 17:40:00	30.02	H2SO4/KM 2 nO4	9	1	0.03331

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1203184695	PCB Laboratory Control	WE141001-06	1	mL	Final Solvent: Hexane
MS	1203184696	PCB Laboratory Control	WE141001-06	1	mL	Verified By: AV
MS	1203184698	PCB Laboratory Control	WE141001-06	1	mL	Clean up Initials: SLW Clean up SOP: GL-OA-E-037

# Prep Logbook

**Batch ID:** 1426142      **Verified by:** \_\_\_\_\_  
**Analyst:** Shannon Whitehead  
**Method:** SW846 3541

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

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)
MS	1203185541	PCB Laboratory Control		WE141001-06	1	mL	Clean up Date: 10-10-14
MSD	1203184697	PCB Laboratory Control		WE141001-06	1	mL	
MSD	1203184699	PCB Laboratory Control		WE141001-06	1	mL	* Sample 358596001 is light weight and has characteristics of lint. Aliquoted at 10g.
MSD	1203185542	PCB Laboratory Control		WE141001-06	1	mL	
SURR	All	PEST LOW LEVEL SURROGATE 200 UG/L		WE140922-01	1	mL	* Sample 358672001 is light weight tree bark and was aliquoted at 10g.
REGNT	All	5% Potassium Permanganate		2159385	5	mL	
REGNT	All	1:1 sulfuric acid		2159476	5	mL	
REGNT	All	Hexane		2160260-B10	120	mL	
SOURC	All	SODIUM SULFATE		2148821	30	g	