

SAF-RC-232
100-IU-2 & 100-IU-6 Remaining
Waste Sites – Soil Full Protocol
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt

H4-21

KW 9/25/13
INITIAL/DATE

COMMENTS:

SDG XP0010

SAF-RC-232

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location: 600-301



September 13, 2013

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

Re: RC-232 Soil
Work Order: 332930
SDG: XP0010

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 06, 2013. 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-232-050
Enclosures



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Case Narrative

**Receipt Narrative
for
WC-HANFORD, INC.
SDG: XP0010
Work Order: 332930**

September 23, 2013

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 September 06, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. GEL is not currently certified for method NWTPH-Dx. The laboratory has analyzed PT samples and applied for the certification.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
332930016	J1RWT5

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, GC Semivolatile Herbicide, GC Semivolatile Pesticide, General Chemistry and Metals.



Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

004430

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: DUNNUM, AJ
 Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites
 Ice Chest No.: WCH-11-011
 Shipped To: Eberline - GEL

Company Contact: Joan Kessner
 Telephone No.: 375-4688
 Project Coordinator: KESSNER, JH
 Price Code: 8C
 Data Turnaround: 15 Days
 7 MAR 9 5-13

Sampling Location: 600-301
 Field Logbook No.: EL-1666-01
 Offsite Property No.: A100 948
 COA: 0603012000
 Method of Shipment: Fed Ex
 Bill of Lading/Air Bill No.: See OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS

NONE

Special Handling and/or Storage

COOL 4 C

SAMPLE ANALYSIS

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C
J1RWR0	SOIL	9/5/13	0719						
J1RWR1	SOIL	9/5/13	0725						
J1RWR2	SOIL	9/5/13	0730						
J1RWR3	SOIL	9/5/13	0738						
J1RWR4	SOIL	9/5/13	0746						

See item (1) in Special Instructions

See item (2) in Special Instructions

TPH-Diesel WTPH-D +

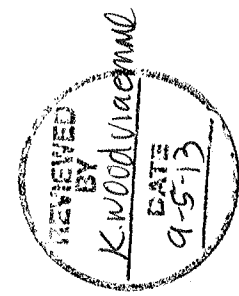
Pesticides - 8081; Chloro-Herbicides - EPA8151

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Bill Hudson	9-5-13 0930	Bill Hudson	9-5-13 0950
Bill Hudson	9-5-13 1055	Bill Hudson	9-5-13 1055
Bill Hudson	9-5-13 1200	James Pellegrini	9-6-13 0900

SPECIAL INSTRUCTIONS

- (1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)
- (2) IC Anions - 9086 (Bromide, Chloride, Fluoride, Nitrate, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in Phosphate, Sulfate); NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)



XP0010

FINAL SAMPLE DISPOSITION

Disposed By: _____ Date/Time: _____

WCH-EE-011

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 2 of 4
RC-232-050
Price Code 8C
Data Turnaround

Collector: DUNNUM, AJ
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites
Ice Chest No.: WCH-11-011
Shipped To: Eberline - GEL

Company Contact: Joan Kessner
Telephone No.: 375-4688
Project Coordinator: KESSNER, JH
SAF No.: RC-232
Method of Shipment: Fed Ex
Field Logbook No.: EL-1666-01
Offsite Property No.: A120948
COA: 0603012000
Bill of Lading/Air Bill No.: See OSPC

15 Days
9-5-13
9-5-13

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4 C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C
J1RWR5	SOIL	9/5/13	0755		X	X	X	
J1RWR6	SOIL	9/5/13	0813		X	X	X	
J1RWR7	SOIL	9/5/13	0823		X	X	X	
J1RWR8	SOIL	9/5/13	0830		X	X	X	
J1RWR9	SOIL	9/5/13	0835		X	X	X	

SAMPLE ANALYSIS

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C
J1RWR5	SOIL	9/5/13	0755		X	X	X	
J1RWR6	SOIL	9/5/13	0813		X	X	X	
J1RWR7	SOIL	9/5/13	0823		X	X	X	
J1RWR8	SOIL	9/5/13	0830		X	X	X	
J1RWR9	SOIL	9/5/13	0835		X	X	X	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Joan Dunnum	9-5-13 0950	BHUDSON	9/5/13 0930
BHUDSON	9/5/13 1055	JENNIFER PELLEGRINI	9-5-13 1055
JENNIFER PELLEGRINI	9-5-13	JENNIFER PELLEGRINI	9-13-0900

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)
 (2) IC Anions - 9056 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in Phosphate, Sulfate); NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)

REVIEWED BY: K. WOOD VINCIGUERRA
DATE: 9-5-13

FINAL SAMPLE DISPOSITION: XPO010

Generated Date/Time: 09/05/2013 04:39, PDT

RC-232-050
Price Code
Project Coordinator
KESSNER, JH
SAF No.
RC-232
Method of Shipment
fed ex
Bill of Lading/Air Bill No.
See OSC

Company Contact
Joan Kessner
Telephone No.
375-4688
Project Coordinator
KESSNER, JH
SAF No.
RC-232
Method of Shipment
fed ex
Bill of Lading/Air Bill No.
See OSC

Field Logbook No.
COA
0603012000
Offsite Property No.
A120948

Company Contact
Joan Kessner
Telephone No.
375-4688
Project Coordinator
KESSNER, JH
SAF No.
RC-232
Method of Shipment
fed ex
Bill of Lading/Air Bill No.
See OSC

Project Designation
100-IU-2 & 100-IU-6 Remaining Waste Sites
Sampling Location
600-301
Field Logbook No.
COA
0603012000
Offsite Property No.
A120948

Ice Chest No.
WCH-11-011
Shipped To
Eberline - GEL

Shipped To
Eberline - GEL

POSSIBLE SAMPLE HAZARDS/REMARKS
NONE

Special Handling and/or Storage
COOL 4 C

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C
J1RWT0	SOIL	9/5/13	0841			X	X	X	X
J1RWT1	SOIL	9/5/13	0853			X	X	X	X
J1RWT2	SOIL	9/5/13	0925			X	X	X	X
J1RWT3	SOIL	9/5/13	0943			X	X	X	X
J1RWT4	SOIL	9/5/13	0719			X	X	X	X

SAMPLE ANALYSIS

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C
J1RWT0	SOIL	9/5/13	0841			X	X	X	X
J1RWT1	SOIL	9/5/13	0853			X	X	X	X
J1RWT2	SOIL	9/5/13	0925			X	X	X	X
J1RWT3	SOIL	9/5/13	0943			X	X	X	X
J1RWT4	SOIL	9/5/13	0719			X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Joan Kessner	9/5-13 0800	Burdson	9/5/13 0930
Burdson	9/5/13 1055	Jennifer Bellgrini	9-6-13 0900
WCH	9-5-13		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Joan Kessner	9/5-13 0800	Burdson	9/5/13 0930
Burdson	9/5/13 1055	Jennifer Bellgrini	9-6-13 0900
WCH	9-5-13		

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)

(2) IC Anions - 9086 (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Nitrogen in Nitrate, Phosphorus in Phosphate, Sulfate), NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)

REVIEWED BY: K. Wood V. Vacca
DATE: 9-5-13

X P0010

Washington Closure Hanford

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

RC-232-050

Page 4 of 4

Collector: DUNNUM, AJ
Company Contact: Joan Kessner
Telephone No.: 375-4688
Project Coordinator: KESSNER, JH
Price Code: 8C
Data Turnaround: 15 Days
Project Designation: 100-IU-2 & 100-IU-6 Remaining Waste Sites
Sampling Location: 600-301
SAF No.: RC-232
Method of Shipment: Fed Ex
Ice Chest No.: WCH-11-011
Field Logbook No.: EL-1666-01
COA: 0603012000
Offsite Property No.: A120948
Bill of Lading/Air Bill No.: See OSPC

Sample No.	Matrix	Sample Date	Sample Time	Preservation	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	SPECIAL INSTRUCTIONS	
										(1) ICP Metals - 6010TR (Close-out List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) (Mercury)	(2) IC Anions - 9056 (Bromide, Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphorus in Phosphate, Sulfate), NO2/NO3 - 353.1 (Nitrogen in Nitrite and Nitrate); pH (Soil) - 9045 (pH Measurement)
J1RWT5	SOIL	9/5/13	0710								
<p>POSSIBLE SAMPLE HAZARDS/REMARKS NONE</p> <p>Special Handling and/or Storage COOL 4 C</p> <p>SAMPLE ANALYSIS</p>											

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
James Dunnum	0950	Bruce Anderson	9/5/13 0950
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Bruce Anderson	9/5/13 1055	James Dunnum	9-5-13 1055
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
James Dunnum	1200	Jennifer Pellegrini	9-6-13 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

FINAL SAMPLE DISPOSITION

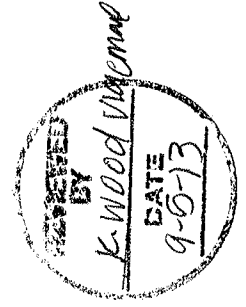
Disposal Method: _____

Disposed By: _____

Date/Time: _____

WCH-EE-011

Generated Date/Time: 09/05/2013 04:39, PDT



X P0010

SAMPLE RECEIPT & REVIEW FORM

Client: WCHN SDG/AR/COC/Work Order: 332907 / 332930 Date Received: 9-10-13 Received By: JP

Suspected Hazard Information	Yes	No
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.		
COC/Samples marked as radioactive?		
Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>2000</u>		
If yes, Were swipes taken of sample containers < action levels?		
COC/Samples marked containing PCBs?		
Package, COC, and/or Samples marked as beryllium or asbestos containing?		
Shipped as a DOT Hazardous?		
Samples identified as Foreign Soil?		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<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>Blue ice Dry ice None Other (describe)</u> *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>			Temperature Device Serial #: <u>4150209</u> Secondary Temperature Device Serial # (If Applicable):
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 IDs, containers affected and observed pH: If Preservation added, Lot#: Sample IDs and containers affected:
6 VOA vials free of headspace (defined as < 6mm bubble)?	<input checked="" type="checkbox"/>			Sample IDs 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"/>			IDs 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.	<input checked="" type="checkbox"/>			Circle Applicable: FedEx Air (circled) FedEx Ground UPS Field Services Courier Other <u>7900 2254 0189</u> <u>11</u> <u>11</u> <u>0360</u>

Comments (Use Continuation Form if needed):

Laboratory Certifications

List of current GEL Certifications as of 13 September 2013

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	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
Nevada	SC000122011-1
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 Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235-13-8
Utah NELAP	SC000122013-8
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 XP0010**

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: 1329326
Prep Batch Number: 1329325

Sample Analysis

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

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202943115	Method Blank (MB)
1202943116	Laboratory Control Sample (LCS)
1202943117	332930003(J1RWR2) Matrix Spike (MS)
1202943118	332930003(J1RWR2) 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# 23.

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 332930011 (J1RWT0) failed to meet acceptance criteria for surrogate recovery and was re-extracted. The re-extracted sample failed surrogate recovery in the same manner; therefore, the failure is attributed to matrix interference. The confirmation data were included in the Miscellaneous Data section.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

QC Sample Designation

Sample 332930003 (J1RWR2) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement

The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement

The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement

The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications

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

Preparation/Analytical Method Verification

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

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis

Sample 332930011 (J1RWT0) was re-extracted due to low surrogate recovery. The first analysis was reported.

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 #1220829 was generated for this SDG.

Manual Integrations

Manual integration was required for surrogates.

Additional Comments

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

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Certification Statement

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

DATA EXCEPTION REPORT

Mo.Day Yr. 12-SEP-13	Division: Federal	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/FID	Test / Method: NWTPH-Dx in Soil	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1329326	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 332930(XP0010)			
Application Issues: Failed Yield for Surrogates			
Specification and Requirements Exception Description:		DER Disposition:	
1. Sample 332930011 recovered o-Terphenyl at 40%(SPC Limit: 50%-150%).		1. The sample was re-extracted and re-analyzed and confirmed the results. Matrix interference has been demonstrated. The initial results are reported.	

Originator's Name:
Benjamin Taft 12-SEP-13

Data Validator/Group Leader:
Cameron Bearden 12-SEP-13

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: XP0010 GEL Work Order: 332930 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

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

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

DL Indicates that sample is diluted.

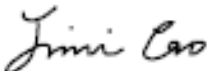
RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

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

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

Signature: 

Name: Jimin Cao

Date: 17 SEP 2013

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 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO
Sample ID: 332930001
Matrix: SOIL
Collect Date: 05-SEP-13 07:19
Receive Date: 06-SEP-13
Collector: Client
Moisture: .355%

Project: WCHN00213
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)	U	2170	2170	6690	ug/kg	1	BYT1	09/09/13	2306	1329326	1
Motor Oil (C20-C36)	J	6340	2170	6690	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	586 ug/kg	669	87.6	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1
Sample ID: 332930002
Matrix: SOIL
Collect Date: 05-SEP-13 07:25
Receive Date: 06-SEP-13
Collector: Client
Moisture: .755%

Project: WCHN00213
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)	U	2170	2170	6680	ug/kg	1	BYT1	09/09/13	2342	1329326	1
Motor Oil (C20-C36)	J	3640	2170	6680	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	596 ug/kg	668	89.2	(50%-150%)

Notes:

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2
Sample ID: 332930003
Matrix: SOIL
Collect Date: 05-SEP-13 07:30
Receive Date: 06-SEP-13
Collector: Client
Moisture: .466%

Project: WCHN00213
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)	U	2170	2170	6680	ug/kg	1	BYT1	09/10/13	0020	1329326	1
Motor Oil (C20-C36)		7340	2170	6680	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	576 ug/kg	668	86.3	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR4
Sample ID: 332930005
Matrix: SOIL
Collect Date: 05-SEP-13 07:46
Receive Date: 06-SEP-13
Collector: Client
Moisture: .526%

Project: WCHN00213
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)	U	2180	2180	6690	ug/kg	1	BYT1	09/10/13	0246	1329326	1
Motor Oil (C20-C36)	J	4360	2180	6690	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	589 ug/kg	669	88.0	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
Sample ID: 332930006
Matrix: SOIL
Collect Date: 05-SEP-13 07:55
Receive Date: 06-SEP-13
Collector: Client
Moisture: .649%

Project: WCHN00213
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)	U	2180	2180	6710	ug/kg	1	BYT1	09/10/13	0322	1329326	1
Motor Oil (C20-C36)	J	3690	2180	6710	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	496 ug/kg	671	73.9	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6
Sample ID: 332930007
Matrix: SOIL
Collect Date: 05-SEP-13 08:13
Receive Date: 06-SEP-13
Collector: Client
Moisture: .479%

Project: WCHN00213
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)	U	2170	2170	6670	ug/kg	1	BYT1	09/10/13	0512	1329326	1
Motor Oil (C20-C36)	J	2920	2170	6670	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	452 ug/kg	667	67.8	(50%-150%)

Notes:

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7
Sample ID: 332930008
Matrix: SOIL
Collect Date: 05-SEP-13 08:23
Receive Date: 06-SEP-13
Collector: Client
Moisture: .95%

Project: WCHN00213
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)	U	2180	2180	6720	ug/kg	1	BYT1	09/10/13	0549	1329326	1
Motor Oil (C20-C36)		6990	2180	6720	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	501 ug/kg	672	74.7	(50%-150%)

Notes:

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8
Sample ID: 332930009
Matrix: SOIL
Collect Date: 05-SEP-13 08:30
Receive Date: 06-SEP-13
Collector: Client
Moisture: .539%

Project: WCHN00213
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)	U	2170	2170	6680	ug/kg	1	BYT1	09/10/13	0625	1329326	1
Motor Oil (C20-C36)	J	4180	2170	6680	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"		489 ug/kg	668	73.2	(50%-150%)

Notes:

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9
Sample ID: 332930010
Matrix: SOIL
Collect Date: 05-SEP-13 08:35
Receive Date: 06-SEP-13
Collector: Client
Moisture: .391%

Project: WCHN00213
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)	U	2170	2170	6680	ug/kg	1	BYT1	09/10/13	0702	1329326	1
Motor Oil (C20-C36)	J	3120	2170	6680	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	474 ug/kg	668	70.9	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0
Sample ID: 332930011
Matrix: SOIL
Collect Date: 05-SEP-13 08:41
Receive Date: 06-SEP-13
Collector: Client
Moisture: .287%

Project: WCHN00213
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)	U	2170	2170	6670	ug/kg	1	BYT1	09/10/13	0739	1329326	1
Motor Oil (C20-C36)	J	2840	2170	6670	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/11/13	1805	1330253

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"	273 ug/kg	667	40.9*	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT1
Sample ID: 332930012
Matrix: SOIL
Collect Date: 05-SEP-13 08:53
Receive Date: 06-SEP-13
Collector: Client
Moisture: .546%

Project: WCHN00213
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)	U	2170	2170	6690	ug/kg	1	BYT1	09/10/13	0816	1329326	1
Motor Oil (C20-C36)	J	5480	2170	6690	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	581 ug/kg	669	86.9	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2	Project: WCHN00213
Sample ID: 332930013	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 09:25	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .521%	

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)	J	2410	2180	6690	ug/kg	1	BYT1	09/10/13	0856	1329326	1
Motor Oil (C20-C36)		14000	2180	6690	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	503 ug/kg	669	75.1	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3
Sample ID: 332930014
Matrix: SOIL
Collect Date: 05-SEP-13 09:43
Receive Date: 06-SEP-13
Collector: Client
Moisture: 3.06%

Project: WCHN00213
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)	U	2230	2230	6860	ug/kg	1	BYT1	09/10/13	0932	1329326	1
Motor Oil (C20-C36)		9910	2230	6860	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	510 ug/kg	686	74.4	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 13, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT4
Sample ID: 332930015
Matrix: SOIL
Collect Date: 05-SEP-13 07:19
Receive Date: 06-SEP-13
Collector: Client
Moisture: .385%

Project: WCHN00213
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)	U	2160	2160	6660	ug/kg	1	BYT1	09/10/13	1009	1329326	1
Motor Oil (C20-C36)		6870	2160	6660	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	AXV1	09/06/13	1655	1329325

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"	479 ug/kg	666	71.9	(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 13, 2013

Page 1 of 2

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

Contact: Joan Kessner

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Diesel Range Organics											
Batch	1329326										
QC1202943116	LCS										
Diesel Range Organics (C10-C20)	66600			64800	ug/kg		97.3	(70%-130%)	BYT1	09/09/13	22:29
Motor Oil (C20-C36)	66600			69500	ug/kg		104	(70%-130%)			
**o-Terphenyl	666			599	ug/kg		89.9	(50%-150%)			
QC1202943115	MB										
Diesel Range Organics (C10-C20)			U	2160	ug/kg					09/09/13	21:52
Motor Oil (C20-C36)			U	2160	ug/kg						
**o-Terphenyl	665			470	ug/kg		70.6	(50%-150%)			
QC1202943117	332930003 MS										
Diesel Range Organics (C10-C20)	66700	U	2170	61800	ug/kg		92.6	(70%-130%)		09/10/13	00:56
Motor Oil (C20-C36)	66700		7340	72700	ug/kg		98	(70%-130%)			
**o-Terphenyl	667		576	672	ug/kg		101	(50%-150%)			
QC1202943118	332930003 MSD										
Diesel Range Organics (C10-C20)	66900	U	2170	66500	ug/kg	7.38	99.4	(0%-20%)		09/10/13	01:32
Motor Oil (C20-C36)	66900		7340	81300	ug/kg	11.1	111	(0%-20%)			
**o-Terphenyl	669		576	716	ug/kg		107	(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

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

QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Page 2 of 2

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
P	Aroclor target analyte with greater than 25% difference between column analyses.										
T	Spike and/or spike duplicate sample recovery is outside control limits.										
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.										
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier										
o	Analyte failed to recover within LCS limits (Organics only)										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ 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: 1329325 Verified by: _____
 Analyst: Alberto Velasco
 Method: SW846 3541

Lab SOP: GL-OA-E-010 REV# 21
 Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202943115 MB	06-SEP-2013 16:55:00	30.06	1	0.03327
1202943116 LCS	06-SEP-2013 16:55:00	30.02	1	0.03331
332930001	06-SEP-2013 16:55:00	30.01	1	0.03332
332930002	06-SEP-2013 16:55:00	30.16	1	0.03316
332930003	06-SEP-2013 16:55:00	30.07	1	0.03326
1202943117 MS (332930003)	06-SEP-2013 16:55:00	30.11	1	0.03321
1202943118 MSD (332930003)	06-SEP-2013 16:55:00	30.03	1	0.0333
332930004	06-SEP-2013 16:55:00	30.24	1	0.03307
332930005	06-SEP-2013 16:55:00	30.04	1	0.03329
332930006	06-SEP-2013 16:55:00	30	1	0.03333
332930007	06-SEP-2013 16:55:00	30.14	1	0.03318
332930008	06-SEP-2013 16:55:00	30.06	1	0.03327
332930009	06-SEP-2013 16:55:00	30.12	1	0.0332
332930010	06-SEP-2013 16:55:00	30.06	1	0.03327
332930011	06-SEP-2013 16:55:00	30.09	1	0.03323
332930012	06-SEP-2013 16:55:00	30.06	1	0.03327
332930013	06-SEP-2013 16:55:00	30.03	1	0.0333
332930014	06-SEP-2013 16:55:00	30.07	1	0.03326
332930015	06-SEP-2013 16:55:00	30.15	1	0.03317

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1202943116	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL	Final Solvent: CH2Cl2 Verified By: MJS
MS	1202943117	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL	
MSD	1202943118	AZDRO SPIKE LCS STD,4000ug/ml	WFI130905-52	1	mL	
SURR	All	20 ppm surrogate	WE130618-04	1	mL	
REGNT	All	Methylene Chloride	1960138-D	120	mL	
SOURC	All	SODIUM SULFATE	1948175	30	g	

Pesticide Analysis

Case Narrative

**Pesticide Case Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0010**

Method/Analysis Information

Procedure: Organochlorine Pesticides and Chlorinated Hydrocarbons
Analytical Method: SW846 3541/8081B
Prep Method: SW846 3541
Analytical Batch Number: 1329317
Prep Batch Number: 1329316

Sample Analysis

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202943098	Method Blank (MB)
1202943099	Laboratory Control Sample (LCS)
1202943100	332930001(J1RWR0) Matrix Spike (MS)
1202943101	332930001(J1RWR0) 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-041 REV# 13.

Raw data reports are processed and reviewed by the analyst using ChemStation software. False positives have been removed from the ChemStation 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 calibration verification standards (CVS, ICV, or CCV) requirements have not been met for this SDG. Several target analytes failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. These target analytes were not detected above the PQL in the samples; therefore, the non-compliance has no adverse effects on the data.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries

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

Laboratory Control Sample (LCS) Recovery

The laboratory control sample (LCS) spike recoveries met the acceptance limits.

QC Sample Designation

Sample 332930001 (J1RWR0) 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 values between the MS and MSD were within 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 in this analytical batch 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.

Sample Dilutions

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

Sample Re-extraction/Re-analysis

Re-extractions or re-analyses were not required in this SDG in this analytical batch unless confirmations or dilutions were required.

Florisil

Florisil clean-up was not performed on client and quality control samples in this batch.

Miscellaneous Information:**Electronic Package Comment**

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

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

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not 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 pesticide 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:

Detected target analytes were reported from the analytical column with the higher concentration. Results below the method detection limit (non-detects) were reported from column one.

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 recovery 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).

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
ECD5A.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)

ECD5A.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)
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Certification Statement

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

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO Project: WCHN00213
 Sample ID: 332930001 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:19
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .355%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.33	ug/kg	1	RXE1	09/07/13	2107	1329317	1
4,4'-DDE	U	0.334	0.334	1.33	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.33	ug/kg	1					
Aldrin	U	0.167	0.167	0.667	ug/kg	1					
Dieldrin	U	0.334	0.334	1.33	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.667	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.33	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.33	ug/kg	1					
Endrin	U	0.334	0.334	1.33	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.33	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.33	ug/kg	1					
Heptachlor	U	0.167	0.167	0.667	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.667	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.67	ug/kg	1					
Toxaphene	U	5.55	5.55	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.667	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.667	ug/kg	1					
beta-BHC	U	0.167	0.167	0.667	ug/kg	1					
delta-BHC	U	0.167	0.167	0.667	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.667	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.667	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	27.8 ug/kg	33.4	83.3	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	27.1 ug/kg	33.4	81.4	(37%-129%)

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO
Sample ID: 332930001

Project: WCHN00213
Client ID: WCHN001

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1
Sample ID: 332930002
Matrix: SOIL
Collect Date: 05-SEP-13 07:25
Receive Date: 06-SEP-13
Collector: Client
Moisture: .755%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.335	0.335	1.34	ug/kg	1	RXE1	09/07/13	2152	1329317	1
4,4'-DDE	U	0.335	0.335	1.34	ug/kg	1					
4,4'-DDT	U	0.335	0.335	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.670	ug/kg	1					
Dieldrin	U	0.335	0.335	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.670	ug/kg	1					
Endosulfan II	U	0.335	0.335	1.34	ug/kg	1					
Endosulfan sulfate	U	0.335	0.335	1.34	ug/kg	1					
Endrin	U	0.335	0.335	1.34	ug/kg	1					
Endrin aldehyde	U	0.335	0.335	1.34	ug/kg	1					
Endrin ketone	U	0.335	0.335	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.670	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.670	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.70	ug/kg	1					
Toxaphene	U	5.58	5.58	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.670	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.670	ug/kg	1					
beta-BHC	U	0.167	0.167	0.670	ug/kg	1					
delta-BHC	U	0.167	0.167	0.670	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.670	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.670	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	30.0 ug/kg	33.5	89.6	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.4 ug/kg	33.5	84.7	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1
Sample ID: 332930002

Project: WCHN00213
Client ID: WCHN001

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2	Project: WCHN00213
Sample ID: 332930003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:30	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .466%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.34	ug/kg	1	RXE1	09/07/13	2207	1329317	1
4,4'-DDE	U	0.334	0.334	1.34	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.668	ug/kg	1					
Dieldrin	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.668	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.34	ug/kg	1					
Endrin	U	0.334	0.334	1.34	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.34	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.668	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.668	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.68	ug/kg	1					
Toxaphene	U	5.56	5.56	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.668	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.668	ug/kg	1					
beta-BHC	U	0.167	0.167	0.668	ug/kg	1					
delta-BHC	U	0.167	0.167	0.668	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.668	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.668	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	29.4 ug/kg	33.4	88.0	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.1 ug/kg	33.4	84.1	(37%-129%)

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

Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2
Sample ID: 332930003

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR3
Sample ID: 332930004
Matrix: SOIL
Collect Date: 05-SEP-13 07:38
Receive Date: 06-SEP-13
Collector: Client
Moisture: 2.94%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.342	0.342	1.37	ug/kg	1	RXE1	09/07/13	2222	1329317	1
4,4'-DDE	U	0.342	0.342	1.37	ug/kg	1					
4,4'-DDT	U	0.342	0.342	1.37	ug/kg	1					
Aldrin	U	0.171	0.171	0.684	ug/kg	1					
Dieldrin	U	0.342	0.342	1.37	ug/kg	1					
Endosulfan I	U	0.171	0.171	0.684	ug/kg	1					
Endosulfan II	U	0.342	0.342	1.37	ug/kg	1					
Endosulfan sulfate	U	0.342	0.342	1.37	ug/kg	1					
Endrin	U	0.342	0.342	1.37	ug/kg	1					
Endrin aldehyde	U	0.342	0.342	1.37	ug/kg	1					
Endrin ketone	U	0.342	0.342	1.37	ug/kg	1					
Heptachlor	U	0.171	0.171	0.684	ug/kg	1					
Heptachlor epoxide	U	0.171	0.171	0.684	ug/kg	1					
Methoxychlor	U	1.71	1.71	6.84	ug/kg	1					
Toxaphene	U	5.70	5.70	17.1	ug/kg	1					
alpha-BHC	U	0.171	0.171	0.684	ug/kg	1					
alpha-Chlordane	U	0.171	0.171	0.684	ug/kg	1					
beta-BHC	U	0.171	0.171	0.684	ug/kg	1					
delta-BHC	U	0.171	0.171	0.684	ug/kg	1					
gamma-BHC (Lindane)	U	0.171	0.171	0.684	ug/kg	1					
gamma-Chlordane	U	0.171	0.171	0.684	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	30.5 ug/kg	34.2	89.0	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.7 ug/kg	34.2	84.0	(37%-129%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR3
Sample ID: 332930004

Project: WCHN00213
Client ID: WCHN001

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR4 Project: WCHN00213
 Sample ID: 332930005 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:46
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .526%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.33	ug/kg	1	RXE1	09/07/13	2237	1329317	1
4,4'-DDE	U	0.334	0.334	1.33	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.33	ug/kg	1					
Aldrin	U	0.167	0.167	0.667	ug/kg	1					
Dieldrin	U	0.334	0.334	1.33	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.667	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.33	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.33	ug/kg	1					
Endrin	U	0.334	0.334	1.33	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.33	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.33	ug/kg	1					
Heptachlor	U	0.167	0.167	0.667	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.667	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.67	ug/kg	1					
Toxaphene	U	5.56	5.56	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.667	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.667	ug/kg	1					
beta-BHC	U	0.167	0.167	0.667	ug/kg	1					
delta-BHC	U	0.167	0.167	0.667	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.667	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.667	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	26.8 ug/kg	33.4	80.2	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	25.0 ug/kg	33.4	75.0	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR4
Sample ID: 332930005

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
 Sample ID: 332930006
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:55
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .649%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.34	ug/kg	1	RXE1	09/07/13	2252	1329317	1
4,4'-DDE	U	0.334	0.334	1.34	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.669	ug/kg	1					
Dieldrin	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.669	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.34	ug/kg	1					
Endrin	U	0.334	0.334	1.34	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.34	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.669	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.669	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.69	ug/kg	1					
Toxaphene	U	5.57	5.57	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.669	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.669	ug/kg	1					
beta-BHC	U	0.167	0.167	0.669	ug/kg	1					
delta-BHC	U	0.167	0.167	0.669	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.669	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.669	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	25.4 ug/kg	33.4	76.1	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	24.9 ug/kg	33.4	74.5	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
Sample ID: 332930006

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6
Sample ID: 332930007
Matrix: SOIL
Collect Date: 05-SEP-13 08:13
Receive Date: 06-SEP-13
Collector: Client
Moisture: .479%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.34	ug/kg	1	RXE1	09/07/13	2337	1329317	1
4,4'-DDE	U	0.334	0.334	1.34	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.669	ug/kg	1					
Dieldrin	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.669	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.34	ug/kg	1					
Endrin	U	0.334	0.334	1.34	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.34	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.669	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.669	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.69	ug/kg	1					
Toxaphene	U	5.57	5.57	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.669	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.669	ug/kg	1					
beta-BHC	U	0.167	0.167	0.669	ug/kg	1					
delta-BHC	U	0.167	0.167	0.669	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.669	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.669	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	27.6 ug/kg	33.4	82.6	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	27.8 ug/kg	33.4	83.3	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6
Sample ID: 332930007

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7	Project: WCHN00213
Sample ID: 332930008	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:23	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .95%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.336	0.336	1.34	ug/kg	1	RXE1	09/07/13	2351	1329317	1
4,4'-DDE	U	0.336	0.336	1.34	ug/kg	1					
4,4'-DDT	U	0.336	0.336	1.34	ug/kg	1					
Aldrin	U	0.168	0.168	0.672	ug/kg	1					
Dieldrin	U	0.336	0.336	1.34	ug/kg	1					
Endosulfan I	U	0.168	0.168	0.672	ug/kg	1					
Endosulfan II	U	0.336	0.336	1.34	ug/kg	1					
Endosulfan sulfate	U	0.336	0.336	1.34	ug/kg	1					
Endrin	U	0.336	0.336	1.34	ug/kg	1					
Endrin aldehyde	U	0.336	0.336	1.34	ug/kg	1					
Endrin ketone	U	0.336	0.336	1.34	ug/kg	1					
Heptachlor	U	0.168	0.168	0.672	ug/kg	1					
Heptachlor epoxide	U	0.168	0.168	0.672	ug/kg	1					
Methoxychlor	U	1.68	1.68	6.72	ug/kg	1					
Toxaphene	U	5.59	5.59	16.8	ug/kg	1					
alpha-BHC	U	0.168	0.168	0.672	ug/kg	1					
alpha-Chlordane	U	0.168	0.168	0.672	ug/kg	1					
beta-BHC	U	0.168	0.168	0.672	ug/kg	1					
delta-BHC	U	0.168	0.168	0.672	ug/kg	1					
gamma-BHC (Lindane)	U	0.168	0.168	0.672	ug/kg	1					
gamma-Chlordane	U	0.168	0.168	0.672	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	26.0 ug/kg	33.6	77.5	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	25.9 ug/kg	33.6	77.1	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7
Sample ID: 332930008

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8 Project: WCHN00213
 Sample ID: 332930009 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:30
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .539%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.335	0.335	1.34	ug/kg	1	RXE1	09/08/13	0006	1329317	1
4,4'-DDE	U	0.335	0.335	1.34	ug/kg	1					
4,4'-DDT	U	0.335	0.335	1.34	ug/kg	1					
Aldrin	U	0.168	0.168	0.670	ug/kg	1					
Dieldrin	U	0.335	0.335	1.34	ug/kg	1					
Endosulfan I	U	0.168	0.168	0.670	ug/kg	1					
Endosulfan II	U	0.335	0.335	1.34	ug/kg	1					
Endosulfan sulfate	U	0.335	0.335	1.34	ug/kg	1					
Endrin	U	0.335	0.335	1.34	ug/kg	1					
Endrin aldehyde	U	0.335	0.335	1.34	ug/kg	1					
Endrin ketone	U	0.335	0.335	1.34	ug/kg	1					
Heptachlor	U	0.168	0.168	0.670	ug/kg	1					
Heptachlor epoxide	U	0.168	0.168	0.670	ug/kg	1					
Methoxychlor	U	1.68	1.68	6.70	ug/kg	1					
Toxaphene	U	5.58	5.58	16.8	ug/kg	1					
alpha-BHC	U	0.168	0.168	0.670	ug/kg	1					
alpha-Chlordane	U	0.168	0.168	0.670	ug/kg	1					
beta-BHC	U	0.168	0.168	0.670	ug/kg	1					
delta-BHC	U	0.168	0.168	0.670	ug/kg	1					
gamma-BHC (Lindane)	U	0.168	0.168	0.670	ug/kg	1					
gamma-Chlordane	U	0.168	0.168	0.670	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	27.8 ug/kg	33.5	83.0	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	25.9 ug/kg	33.5	77.2	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8
Sample ID: 332930009

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9
 Sample ID: 332930010
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:35
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .391%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.34	ug/kg	1	RXE1	09/08/13	0021	1329317	1
4,4'-DDE	U	0.334	0.334	1.34	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.669	ug/kg	1					
Dieldrin	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.669	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.34	ug/kg	1					
Endrin	U	0.334	0.334	1.34	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.34	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.669	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.669	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.69	ug/kg	1					
Toxaphene	U	5.57	5.57	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.669	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.669	ug/kg	1					
beta-BHC	U	0.167	0.167	0.669	ug/kg	1					
delta-BHC	U	0.167	0.167	0.669	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.669	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.669	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	29.3 ug/kg	33.4	87.7	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.2 ug/kg	33.4	84.4	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9
Sample ID: 332930010

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0 Project: WCHN00213
 Sample ID: 332930011 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:41
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .287%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.333	0.333	1.33	ug/kg	1	RXE1	09/08/13	0036	1329317	1
4,4'-DDE	U	0.333	0.333	1.33	ug/kg	1					
4,4'-DDT	U	0.333	0.333	1.33	ug/kg	1					
Aldrin	U	0.167	0.167	0.667	ug/kg	1					
Dieldrin	U	0.333	0.333	1.33	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.667	ug/kg	1					
Endosulfan II	U	0.333	0.333	1.33	ug/kg	1					
Endosulfan sulfate	U	0.333	0.333	1.33	ug/kg	1					
Endrin	U	0.333	0.333	1.33	ug/kg	1					
Endrin aldehyde	U	0.333	0.333	1.33	ug/kg	1					
Endrin ketone	U	0.333	0.333	1.33	ug/kg	1					
Heptachlor	U	0.167	0.167	0.667	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.667	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.67	ug/kg	1					
Toxaphene	U	5.55	5.55	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.667	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.667	ug/kg	1					
beta-BHC	U	0.167	0.167	0.667	ug/kg	1					
delta-BHC	U	0.167	0.167	0.667	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.667	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.667	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.5 ug/kg	33.3	85.6	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	28.4 ug/kg	33.3	85.1	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0
Sample ID: 332930011

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT1
Sample ID: 332930012

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2
 Sample ID: 332930013
 Matrix: SOIL
 Collect Date: 05-SEP-13 09:25
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .521%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-Pesticide											
8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"											
4,4'-DDD	U	0.334	0.334	1.34	ug/kg	1	RXE1	09/08/13	0106	1329317	1
4,4'-DDE	U	0.334	0.334	1.34	ug/kg	1					
4,4'-DDT	U	0.334	0.334	1.34	ug/kg	1					
Aldrin	U	0.167	0.167	0.668	ug/kg	1					
Dieldrin	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan I	U	0.167	0.167	0.668	ug/kg	1					
Endosulfan II	U	0.334	0.334	1.34	ug/kg	1					
Endosulfan sulfate	U	0.334	0.334	1.34	ug/kg	1					
Endrin	U	0.334	0.334	1.34	ug/kg	1					
Endrin aldehyde	U	0.334	0.334	1.34	ug/kg	1					
Endrin ketone	U	0.334	0.334	1.34	ug/kg	1					
Heptachlor	U	0.167	0.167	0.668	ug/kg	1					
Heptachlor epoxide	U	0.167	0.167	0.668	ug/kg	1					
Methoxychlor	U	1.67	1.67	6.68	ug/kg	1					
Toxaphene	U	5.56	5.56	16.7	ug/kg	1					
alpha-BHC	U	0.167	0.167	0.668	ug/kg	1					
alpha-Chlordane	U	0.167	0.167	0.668	ug/kg	1					
beta-BHC	U	0.167	0.167	0.668	ug/kg	1					
delta-BHC	U	0.167	0.167	0.668	ug/kg	1					
gamma-BHC (Lindane)	U	0.167	0.167	0.668	ug/kg	1					
gamma-Chlordane	U	0.167	0.167	0.668	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	Prep Method 3541 8081B Prep Soil	MXS4	09/06/13	1740	1329316

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3541/8081B	
2	SW846 3541/8081B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	26.8 ug/kg	33.4	80.2	(32%-120%)
Decachlorobiphenyl	8081B/3541 Pesticide Soil Automated Soxhlet "Dry Weight Corrected"	24.9 ug/kg	33.4	74.6	(37%-129%)

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2
Sample ID: 332930013

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3
Sample ID: 332930014

Project: WCHN00213
Client ID: WCHN001

Notes:

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Certificate of Analysis

Report Date: September 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT4
Sample ID: 332930015

Project: WCHN00213
Client ID: WCHN001

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 10, 2013

Page 1 of 5

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

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-Pesticide											
Batch	1329317										
QC1202943099	LCS										
4,4'-DDD	41.6			40.7	ug/kg		97.8	(51%-124%)	RXE1	09/07/13	20:52
4,4'-DDE	41.6			37.7	ug/kg		90.5	(51%-119%)			
4,4'-DDT	41.6			39.9	ug/kg		95.9	(50%-128%)			
Aldrin	16.6			15.2	ug/kg		91.4	(48%-113%)			
Dieldrin	41.6			36.7	ug/kg		88.2	(51%-112%)			
Endosulfan I	16.6			13.5	ug/kg		81.1	(43%-110%)			
Endosulfan II	41.6			38.3	ug/kg		92	(49%-111%)			
Endosulfan sulfate	41.6			38.9	ug/kg		93.6	(54%-121%)			
Endrin	41.6			46.8	ug/kg		112	(54%-134%)			
Endrin aldehyde	41.6			33.8	ug/kg		81.3	(49%-117%)			
Endrin ketone	41.6			34.5	ug/kg		82.8	(48%-110%)			
Heptachlor	16.6			15.5	ug/kg		93.4	(52%-117%)			
Heptachlor epoxide	16.6			15.6	ug/kg		93.5	(53%-115%)			
Methoxychlor	166			154	ug/kg		92.5	(48%-117%)			
alpha-BHC	16.6			16.4	ug/kg		98.4	(50%-122%)			
alpha-Chlordane	16.6			14.6	ug/kg		87.7	(52%-113%)			
beta-BHC	16.6			15.4	ug/kg		92.3	(54%-110%)			
delta-BHC	16.6			16.6	ug/kg		99.9	(53%-117%)			
gamma-BHC (Lindane)	16.6			15.2	ug/kg		91.6	(53%-120%)			
gamma-Chlordane	16.6			15.7	ug/kg		94.1	(52%-117%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-Pesticide											
Batch	1329317										
**4cmx	33.3			29.1	ug/kg		87.5	(32%-120%)	RXE1	09/07/13	20:52
**Decachlorobiphenyl	33.3			28.8	ug/kg		86.7	(37%-129%)			
QC1202943098	MB										
4,4'-DDD			U	0.333	ug/kg					09/07/13	20:37
4,4'-DDE			U	0.333	ug/kg						
4,4'-DDT			U	0.333	ug/kg						
Aldrin			U	0.167	ug/kg						
Dieldrin			U	0.333	ug/kg						
Endosulfan I			U	0.167	ug/kg						
Endosulfan II			U	0.333	ug/kg						
Endosulfan sulfate			U	0.333	ug/kg						
Endrin			U	0.333	ug/kg						
Endrin aldehyde			U	0.333	ug/kg						
Endrin ketone			U	0.333	ug/kg						
Heptachlor			U	0.167	ug/kg						
Heptachlor epoxide			U	0.167	ug/kg						
Methoxychlor			U	1.67	ug/kg						
Toxaphene			U	5.55	ug/kg						
alpha-BHC			U	0.167	ug/kg						
alpha-Chlordane			U	0.167	ug/kg						
beta-BHC			U	0.167	ug/kg						
delta-BHC			U	0.167	ug/kg						

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-Pesticide											
Batch	1329317										
gamma-BHC (Lindane)			U	0.167	ug/kg				RXE1	09/07/13	20:37
gamma-Chlordane			U	0.167	ug/kg						
**4cmx	33.3			25.3	ug/kg		75.9	(32%-120%)			
**Decachlorobiphenyl	33.3			26.3	ug/kg		79	(37%-129%)			
QC1202943100 332930001 MS											
4,4'-DDD	41.7	U	0.334	34.8	ug/kg		83.5	(37%-134%)		09/07/13	21:22
4,4'-DDE	41.7	U	0.334	27.8	ug/kg		66.5	(33%-133%)			
4,4'-DDT	41.7	U	0.334	29.2	ug/kg		70.1	(21%-149%)			
Aldrin	16.7	U	0.167	11.8	ug/kg		70.6	(34%-134%)			
Dieldrin	41.7	U	0.334	30.5	ug/kg		73	(36%-132%)			
Endosulfan I	16.7	U	0.167	11.8	ug/kg		70.9	(36%-125%)			
Endosulfan II	41.7	U	0.334	31.1	ug/kg		74.6	(37%-129%)			
Endosulfan sulfate	41.7	U	0.334	33.2	ug/kg		79.6	(31%-140%)			
Endrin	41.7	U	0.334	40.0	ug/kg		95.8	(45%-142%)			
Endrin aldehyde	41.7	U	0.334	28.7	ug/kg		68.8	(31%-133%)			
Endrin ketone	41.7	U	0.334	29.7	ug/kg		71.1	(30%-139%)			
Heptachlor	16.7	U	0.167	13.7	ug/kg		81.8	(32%-137%)			
Heptachlor epoxide	16.7	U	0.167	13.0	ug/kg		78.1	(36%-130%)			
Methoxychlor	167	U	1.67	137	ug/kg		81.8	(28%-143%)			
alpha-BHC	16.7	U	0.167	13.8	ug/kg		82.9	(37%-129%)			
alpha-Chlordane	16.7	U	0.167	13.1	ug/kg		78.6	(29%-141%)			
beta-BHC	16.7	U	0.167	13.3	ug/kg		79.9	(33%-136%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-Pesticide											
Batch	1329317										
delta-BHC	16.7	U	0.167	14.6	ug/kg		87.5	(37%-136%)	RXE1	09/07/13	21:22
gamma-BHC (Lindane)	16.7	U	0.167	14.1	ug/kg		84.3	(35%-130%)			
gamma-Chlordane	16.7	U	0.167	11.7	ug/kg		70.3	(30%-139%)			
**4cmx	33.4		27.8	26.9	ug/kg		80.5	(32%-120%)			
**Decachlorobiphenyl	33.4		27.1	25.2	ug/kg		75.6	(37%-129%)			
QC1202943101	332930001	MSD									
4,4'-DDD	41.8	U	0.334	36.5	ug/kg	4.63	87.3	(0%-30%)		09/07/13	21:37
4,4'-DDE	41.8	U	0.334	29.0	ug/kg	4.50	69.5	(0%-30%)			
4,4'-DDT	41.8	U	0.334	31.0	ug/kg	5.93	74.2	(0%-30%)			
Aldrin	16.7	U	0.167	12.3	ug/kg	3.90	73.4	(0%-30%)			
Dieldrin	41.8	U	0.334	31.9	ug/kg	4.46	76.3	(0%-30%)			
Endosulfan I	16.7	U	0.167	12.4	ug/kg	4.59	74.1	(0%-30%)			
Endosulfan II	41.8	U	0.334	32.5	ug/kg	4.45	77.9	(0%-30%)			
Endosulfan sulfate	41.8	U	0.334	34.8	ug/kg	4.78	83.4	(0%-30%)			
Endrin	41.8	U	0.334	42.0	ug/kg	5.00	101	(0%-30%)			
Endrin aldehyde	41.8	U	0.334	29.6	ug/kg	3.08	70.9	(0%-30%)			
Endrin ketone	41.8	U	0.334	31.0	ug/kg	4.49	74.3	(0%-30%)			
Heptachlor	16.7	U	0.167	14.3	ug/kg	4.82	85.7	(0%-30%)			
Heptachlor epoxide	16.7	U	0.167	13.7	ug/kg	4.83	81.9	(0%-30%)			
Methoxychlor	167	U	1.67	144	ug/kg	5.45	86.3	(0%-30%)			
alpha-BHC	16.7	U	0.167	14.5	ug/kg	5.02	87	(0%-30%)			
alpha-Chlordane	16.7	U	0.167	13.8	ug/kg	4.98	82.5	(0%-30%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-Pesticide											
Batch	1329317										
beta-BHC	16.7	U	0.167	14.0	ug/kg	4.65	83.6	(0%-30%)	RXE1	09/07/13	21:37
delta-BHC	16.7	U	0.167	15.4	ug/kg	5.15	92	(0%-30%)			
gamma-BHC (Lindane)	16.7	U	0.167	14.7	ug/kg	4.28	87.8	(0%-30%)			
gamma-Chlordane	16.7	U	0.167	12.4	ug/kg	5.31	74.1	(0%-30%)			
**4cmx	33.4		27.8	27.8	ug/kg		83.2	(32%-120%)			
**Decachlorobiphenyl	33.4		27.1	26.1	ug/kg		78.2	(37%-129%)			

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.

^ 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: 1329316 Verified by: _____
 Analyst: Matthew Selepack
 Method: SW846 3541

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

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202943098 MB	06-SEP-2013 17:40:00	30.01	5	0.16661
1202943099 LCS	06-SEP-2013 17:40:00	30.05	5	0.16639
332930001	06-SEP-2013 17:40:00	30.09	5	0.16617
1202943100 MS (332930001)	06-SEP-2013 17:40:00	30.06	5	0.16633
1202943101 MSD (332930001)	06-SEP-2013 17:40:00	30.02	5	0.16656
332930002	06-SEP-2013 17:40:00	30.08	5	0.16622
332930003	06-SEP-2013 17:40:00	30.1	5	0.16611
332930004	06-SEP-2013 17:40:00	30.11	5	0.16606
332930005	06-SEP-2013 17:40:00	30.13	5	0.16595
332930006	06-SEP-2013 17:40:00	30.1	5	0.16611
332930007	06-SEP-2013 17:40:00	30.05	5	0.16639
332930008	06-SEP-2013 17:40:00	30.06	5	0.16633
332930009	06-SEP-2013 17:40:00	30.01	5	0.16661
332930010	06-SEP-2013 17:40:00	30.02	5	0.16656
332930011	06-SEP-2013 17:40:00	30.09	5	0.16617
332930012	06-SEP-2013 17:40:00	30.03	5	0.1665
332930013	06-SEP-2013 17:40:00	30.08	5	0.16622
332930014	06-SEP-2013 17:40:00	30.01	5	0.16661
332930015	06-SEP-2013 17:40:00	30.11	5	0.16606

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1202943099	PESTSPIKE	WE130903-05	1	mL	Final Solvent: Hexane Verified by: AV
MS	1202943100	PESTSPIKE	WE130903-05	1	mL	
MSD	1202943101	PESTSPIKE	WE130903-05	1	mL	
SURR	All	PEST SURROGATE 1000 UG/L	WE130521-08	1	mL	
REGNT	All	Acetone	1949776-B1	60	mL	
REGNT	All	Hexane	1949780-B4	60	mL	
SOURC	All	SODIUM SULFATE	1948175	30	g	

Herbicide Analysis

Case Narrative

**Herbicide Case Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0010**

Method/Analysis Information

Procedure: Analysis of Chlorophenoxy Acid Herbicides by ECD
Analytical Method: SW846 8151A
Prep Method: SW846 8151A
Analytical Batch Number: 1329320
Prep Batch Number: 1329319

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8151A:

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202943105	Method Blank (MB)
1202943106	Laboratory Control Sample (LCS)
1202943107	332930002(J1RWR1) Matrix Spike (MS)
1202943108	332930002(J1RWR1) 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-011 REV# 20.

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

Calibration Information

Initial Calibration

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

Continuing Calibration Verification (CCV) Requirements

All Initial Calibration Verification (ICV) requirements have been met for this SDG. However, not all Calibration Verification Standards (CCV) requirements were met. Dalapon and Dinoseb failed acceptance criteria with a negative bias on one analytical column in the standards bracketing the samples in this SDG. The negative bias for the analytical data is a result of instrument response decreasing after the initial calibration. The instrument response never decreased to a point where the target analytes would not be detected. MCPA failed acceptance criteria with a positive bias on one analytical column in the standards bracketing the samples in this SDG. The positive bias for the analytical data is a result of instrument response increasing after the initial calibration. Since the target analyte was not detected in the samples, the non-compliance had no adverse impact on the data. 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 this SDG.

Laboratory Control Sample (LCS) Recovery

The LCS(1202943106) did not meet spike recovery acceptance criteria for MCPA. Please see the QC Summary for specific failure. Since MCPA was not detected in the associated client samples, the biased high recovery had no adverse impact on the data and the results have been reported.

QC Sample Designation

Sample 332930002 (J1RWR1) was selected for analysis as the matrix spike and matrix spike duplicate.

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 MS(1202943107(J1RWR1))/MSD(1202943108(J1RWR1)) RPD value for Dalapon was not within the acceptance criteria. Please see the QC Summary for specific failure. Since Dalapon was individually within the acceptance limits for the MS and MSD, the non-conformance had no adverse impact on the data and the results have been reported.

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 target analyte concentrations were confirmed on a dissimilar column.

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 in this analytical batch unless confirmations or dilutions were required.

Miscellaneous Information

Electronic Package Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to 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. An electronic signature page inserted after the case narrative of each electronic package will indicate the reviewer name associated with the generation of the data and package. 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

The following DER was generated for this SDG: 1220650.

Manual Integrations

Some initial calibration standards, continuing calibration standards, and/or 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 Herbicide 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 rounding differences in the calculation between the forms, the data reported in the Sample Summary (form 1) and Spike Recovery Report (form 3) may differ slightly from the data reported in Identification Summary (form 10).

Due to software issue, the raw data may not correctly display the updated SPC limits. Please see Sample Data Summary Report and Surrogate Recovery Report for the correct surrogate acceptance limits.

System Configuration

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

Instrument ID	Instrument	System Configuration	Column ID	Column Description
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ECD3A.I_1	Agilent 7890A GC with duel uECD	HP6890 Series ECD	Rtx-CLP I	30m x 0.25mm, 0.25um (Rtx-CLPesticide)
ECD3A.I_2	Agilent 7890A GC with duel uECD	HP6890 Series ECD	Rtx-CLP II	30m x 0.25mm, 0.20um (Rtx-CLPesticideII)

Certification Statement

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

DATA EXCEPTION REPORT

Mo.Day Yr. 12-SEP-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: GC/ECD	Test / Method: SW846 8151A	Matrix Type: Solid	Client Code: CARE, WCHN
Batch ID: 1329320	Sample Numbers: See Below		
<p>Potentially affected work order(s)(SDG): 332318(EUI-9370),332930(XP0010)</p> <p>Application Issues: Failed RPD for MS/MSD, or PS/PSD Failed Recovery for LCS/LCSD</p>			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. The LCS(1202943106) did not meet spike recovery acceptance criteria for MCPA. Please see the QC Summary for specific failure.</p> <p>2. The MS(1202943107)/MSD(1202943108) RPD value for Dalapon was not within the acceptance criteria. Please see the QC Summary for specific failure.</p>		<p>1. Since MCPA was not detected in the associated client samples, the biased high recovery had no adverse impact on the data and the results have been reported.</p> <p>2. Since Dalapon was individually within the acceptance limits for the MS and MSD, the non-conformance had no adverse impact on the data and the results have been reported.</p>	

Originator's Name:

Jennifer Dunagan Jones12-SEP-13

Data Validator/Group Leader:

Barbara Bailey 12-SEP-13

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, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO
 Sample ID: 332930001
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:19
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .355%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.02	ug/kg	1	RXE1	09/11/13	2117	1329320	1
2,4,5-TP	U	1.67	1.67	5.02	ug/kg	1					
2,4-D	U	1.67	1.67	5.02	ug/kg	1					
2,4-DB	U	1.67	1.67	5.02	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.02	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.02	ug/kg	1					
Dinoseb	U	1.67	1.67	5.02	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	93.8 ug/kg	100	93.5	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1	Project: WCHN00213
Sample ID: 332930002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:25	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .755%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.03	ug/kg	1	RXE1	09/11/13	2144	1329320	1
2,4,5-TP	U	1.67	1.67	5.03	ug/kg	1					
2,4-D	U	1.67	1.67	5.03	ug/kg	1					
2,4-DB	U	1.67	1.67	5.03	ug/kg	1					
Dalapon	U	35.2	35.2	101	ug/kg	1					
Dicamba	U	2.01	2.01	5.03	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.03	ug/kg	1					
Dinoseb	U	1.67	1.67	5.03	ug/kg	1					
MCPA	TU	232	232	1010	ug/kg	1					
MCPP	U	201	201	1010	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	101 ug/kg	101	100	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2	Project: WCHN00213
Sample ID: 332930003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:30	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .466%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.66	1.66	5.01	ug/kg	1	RXE1	09/11/13	2303	1329320	1
2,4,5-TP	U	1.66	1.66	5.01	ug/kg	1					
2,4-D	U	1.66	1.66	5.01	ug/kg	1					
2,4-DB	U	1.66	1.66	5.01	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.01	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.01	ug/kg	1					
Dinoseb	U	1.66	1.66	5.01	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	99.5 ug/kg	100	99.2	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR3	Project: WCHN00213
Sample ID: 332930004	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:38	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: 2.94%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.71	1.71	5.15	ug/kg	1	RXE1	09/11/13	2330	1329320	1
2,4,5-TP	U	1.71	1.71	5.15	ug/kg	1					
2,4-D	U	1.71	1.71	5.15	ug/kg	1					
2,4-DB	U	1.71	1.71	5.15	ug/kg	1					
Dalapon	U	36.0	36.0	103	ug/kg	1					
Dicamba	U	2.06	2.06	5.15	ug/kg	1					
Dichlorprop	U	2.33	2.33	5.15	ug/kg	1					
Dinoseb	U	1.71	1.71	5.15	ug/kg	1					
MCPA	TU	237	237	1030	ug/kg	1					
MCPP	U	206	206	1030	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	94.7 ug/kg	103	91.9	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR4	Project: WCHN00213
Sample ID: 332930005	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:46	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .526%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.02	ug/kg	1	RXE1	09/11/13	2356	1329320	1
2,4,5-TP	U	1.67	1.67	5.02	ug/kg	1					
2,4-D	U	1.67	1.67	5.02	ug/kg	1					
2,4-DB	U	1.67	1.67	5.02	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.02	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.02	ug/kg	1					
Dinoseb	U	1.67	1.67	5.02	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	102 ug/kg	100	101	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
 Sample ID: 332930006
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:55
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .649%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.03	ug/kg	1	RXE1	09/12/13	0115	1329320	1
2,4,5-TP	U	1.67	1.67	5.03	ug/kg	1					
2,4-D	U	1.67	1.67	5.03	ug/kg	1					
2,4-DB	U	1.67	1.67	5.03	ug/kg	1					
Dalapon	U	35.2	35.2	101	ug/kg	1					
Dicamba	U	2.01	2.01	5.03	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.03	ug/kg	1					
Dinoseb	U	1.67	1.67	5.03	ug/kg	1					
MCPA	TU	232	232	1010	ug/kg	1					
MCPP	U	201	201	1010	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	93.3 ug/kg	101	92.7	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6	Project: WCHN00213
Sample ID: 332930007	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:13	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .479%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.02	ug/kg	1	RXE1	09/12/13	0142	1329320	1
2,4,5-TP	U	1.67	1.67	5.02	ug/kg	1					
2,4-D	U	1.67	1.67	5.02	ug/kg	1					
2,4-DB	U	1.67	1.67	5.02	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.02	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.02	ug/kg	1					
Dinoseb	U	1.67	1.67	5.02	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	92.4 ug/kg	100	92.1	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7
Sample ID: 332930008
Matrix: SOIL
Collect Date: 05-SEP-13 08:23
Receive Date: 06-SEP-13
Collector: Client
Moisture: .95%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.04	ug/kg	1	RXE1	09/12/13	0208	1329320	1
2,4,5-TP	U	1.67	1.67	5.04	ug/kg	1					
2,4-D	U	1.67	1.67	5.04	ug/kg	1					
2,4-DB	U	1.67	1.67	5.04	ug/kg	1					
Dalapon	U	35.3	35.3	101	ug/kg	1					
Dicamba	U	2.02	2.02	5.04	ug/kg	1					
Dichlorprop	U	2.28	2.28	5.04	ug/kg	1					
Dinoseb	U	1.67	1.67	5.04	ug/kg	1					
MCPA	TU	232	232	1010	ug/kg	1					
MCPP	U	202	202	1010	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	101 ug/kg	101	99.7	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9	Project: WCHN00213
Sample ID: 332930010	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:35	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .391%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.66	1.66	5.01	ug/kg	1	RXE1	09/12/13	0301	1329320	1
2,4,5-TP	U	1.66	1.66	5.01	ug/kg	1					
2,4-D	U	1.66	1.66	5.01	ug/kg	1					
2,4-DB	U	1.66	1.66	5.01	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.01	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.01	ug/kg	1					
Dinoseb	U	1.66	1.66	5.01	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	99.4 ug/kg	100	99.1	(38%-142%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0	Project: WCHN00213
Sample ID: 332930011	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:41	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .287%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.66	1.66	5.01	ug/kg	1	RXE1	09/12/13	0328	1329320	1
2,4,5-TP	U	1.66	1.66	5.01	ug/kg	1					
2,4-D	U	1.66	1.66	5.01	ug/kg	1					
2,4-DB	U	1.66	1.66	5.01	ug/kg	1					
Dalapon	U	35.1	35.1	100	ug/kg	1					
Dicamba	U	2.01	2.01	5.01	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.01	ug/kg	1					
Dinoseb	U	1.66	1.66	5.01	ug/kg	1					
MCPA	TU	231	231	1000	ug/kg	1					
MCPP	U	201	201	1000	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	97.5 ug/kg	100	97.3	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT1
 Sample ID: 332930012
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:53
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .546%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.03	ug/kg	1	RXE1	09/12/13	0354	1329320	1
2,4,5-TP	U	1.67	1.67	5.03	ug/kg	1					
2,4-D	U	1.67	1.67	5.03	ug/kg	1					
2,4-DB	U	1.67	1.67	5.03	ug/kg	1					
Dalapon	U	35.2	35.2	101	ug/kg	1					
Dicamba	U	2.01	2.01	5.03	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.03	ug/kg	1					
Dinoseb	U	1.67	1.67	5.03	ug/kg	1					
MCPA	TU	231	231	1010	ug/kg	1					
MCPP	U	201	201	1010	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	108 ug/kg	101	108	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2	Project: WCHN00213
Sample ID: 332930013	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 09:25	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .521%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.67	1.67	5.03	ug/kg	1	RXE1	09/12/13	0420	1329320	1
2,4,5-TP	U	1.67	1.67	5.03	ug/kg	1					
2,4-D	U	1.67	1.67	5.03	ug/kg	1					
2,4-DB	U	1.67	1.67	5.03	ug/kg	1					
Dalapon	U	35.2	35.2	101	ug/kg	1					
Dicamba	U	2.01	2.01	5.03	ug/kg	1					
Dichlorprop	U	2.27	2.27	5.03	ug/kg	1					
Dinoseb	U	1.67	1.67	5.03	ug/kg	1					
MCPA	TU	231	231	1010	ug/kg	1					
MCPP	U	201	201	1010	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	60.7 ug/kg	101	60.4	(38%-142%)

Notes:

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Certificate of Analysis

Report Date: September 12, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3	Project: WCHN00213
Sample ID: 332930014	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 09:43	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: 3.06%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-HERB											
8151A Herbicides Soil "Dry Weight Corrected"											
2,4,5-T	U	1.71	1.71	5.16	ug/kg	1	RXE1	09/12/13	0447	1329320	1
2,4,5-TP	U	1.71	1.71	5.16	ug/kg	1					
2,4-D	U	1.71	1.71	5.16	ug/kg	1					
2,4-DB	U	1.71	1.71	5.16	ug/kg	1					
Dalapon	U	36.1	36.1	103	ug/kg	1					
Dicamba	U	2.06	2.06	5.16	ug/kg	1					
Dichlorprop	U	2.33	2.33	5.16	ug/kg	1					
Dinoseb	U	1.71	1.71	5.16	ug/kg	1					
MCPA	TU	237	237	1030	ug/kg	1					
MCPP	U	206	206	1030	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 8151A	8151A Herbicides Prep in Soil	MXS4	09/07/13	0858	1329319

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8151A	
2	SW846 8151A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
2,4-Dichlorophenylacetic acid	8151A Herbicides Soil "Dry Weight Corrected"	104 ug/kg	103	101	(38%-142%)

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, 2013

Page 1 of 3

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

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-HERB											
Batch	1329320										
QC1202943106	LCS										
2,4,5-T	40.0			39.7	ug/kg		99.3	(52%-137%)	RXE1	09/11/13	20:24
2,4,5-TP	40.0			39.7	ug/kg		99.5	(58%-133%)			
2,4-D	40.0			40.0	ug/kg		100	(53%-139%)			
2,4-DB	40.0			40.1	ug/kg		100	(61%-139%)			
Dalapon	400		P	293	ug/kg		73.4	(39%-113%)			
Dicamba	40.0			34.8	ug/kg		87.1	(54%-118%)			
Dichlorprop	40.0			45.3	ug/kg		113	(59%-126%)			
Dinoseb	40.0			29.5	ug/kg		73.8	(39%-94%)			
MCPA	4000			5740	ug/kg		144*	(60%-120%)			
MCPP	4000			3200	ug/kg		80.2	(50%-123%)			
**2,4-Dichlorophenylacetic acid	99.9			105	ug/kg		105	(38%-142%)			
QC1202943105	MB										
2,4,5-T			U	1.66	ug/kg					09/11/13	19:58
2,4,5-TP			U	1.66	ug/kg						
2,4-D			U	1.66	ug/kg						
2,4-DB			U	1.66	ug/kg						
Dalapon			U	35.0	ug/kg						
Dicamba			U	2.00	ug/kg						
Dichlorprop			U	2.26	ug/kg						
Dinoseb			U	1.66	ug/kg						

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-HERB											
Batch	1329320										
MCPA			U	230	ug/kg						
MCPP			U	200	ug/kg				RXE1	09/11/13	19:58
**2,4-Dichlorophenylacetic acid	100			81.8	ug/kg		81.9	(38%-142%)			
QC1202943107 332930002 MS											
2,4,5-T	40.3	U	1.67	34.0	ug/kg		84.5	(45%-131%)		09/11/13	22:10
2,4,5-TP	40.3	U	1.67	34.0	ug/kg		84.5	(49%-135%)			
2,4-D	40.3	U	1.67	36.5	ug/kg		90.7	(53%-135%)			
2,4-DB	40.3	U	1.67	34.1	ug/kg		84.8	(61%-139%)			
Dalapon	403	U	35.2 P	168	ug/kg		41.7	(30%-113%)			
Dicamba	40.3	U	2.01	34.9	ug/kg		86.7	(48%-124%)			
Dichlorprop	40.3	U	2.27	34.5	ug/kg		85.6	(46%-138%)			
Dinoseb	40.3	U	1.67	26.0	ug/kg		64.4	(25%-130%)			
MCPA	4030	TU	232	3640	ug/kg		90.3	(50%-133%)			
MCPP	4030	U	201	2800	ug/kg		69.5	(47%-123%)			
**2,4-Dichlorophenylacetic acid	101		101	100	ug/kg		99.8	(38%-142%)			
QC1202943108 332930002 MSD											
2,4,5-T	40.3	U	1.67	35.9	ug/kg	5.37	89.1	(0%-32%)		09/11/13	22:37
2,4,5-TP	40.3	U	1.67	37.4	ug/kg	9.33	92.7	(0%-31%)			
2,4-D	40.3	U	1.67	35.5	ug/kg	3.01	88	(0%-70%)			
2,4-DB	40.3	U	1.67	38.8	ug/kg	12.7	96.2	(0%-27%)			
Dalapon	403	U	35.2	272	ug/kg	47.5*	67.6	(0%-18%)			
Dicamba	40.3	U	2.01	37.3	ug/kg	6.67	92.6	(0%-41%)			
Dichlorprop	40.3	U	2.27	35.8	ug/kg	3.71	88.8	(0%-40%)			
Dinoseb	40.3	U	1.67	32.2	ug/kg	21.5	79.9	(0%-169%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Semi-Volatiles-HERB											
Batch	1329320										
MCPA	4030	TU	232	P	3510	ug/kg	3.57	87.1	(0%-38%)	RXE1	09/11/13 22:37
MCPP	4030	U	201		3040	ug/kg	8.36	75.5	(0%-30%)		
**2,4-Dichlorophenylacetic acid	101		101		112	ug/kg		112	(38%-142%)		

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.

^ 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

The Extraction of Herbicides from Soil and Sludge Samples

Batch ID: 1329319 Verified by: _____
 Analyst: Matthew Selepack
 Method: SW846 8151A

Lab SOP: GL-OA-E-027 REV# 14
 Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Initial pH	Int Ext pH	Sec Ext pH	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1202943105 MB	07-SEP-2013 08:58:00	50.01	3	2	0	10	0.19996
1202943106 LCS	07-SEP-2013 08:58:00	50.06	3	2	0	10	0.19976
332318001	07-SEP-2013 08:58:00	10.26	6	2	0	10	0.97466
332930001	07-SEP-2013 08:58:00	50.01	5	2	0	10	0.19996
332930002	07-SEP-2013 08:58:00	50.05	5	2	0	10	0.1998
1202943107 MS (332930002)	07-SEP-2013 08:58:00	50.03	5	2	0	10	0.19988
1202943108 MSD (332930002)	07-SEP-2013 08:58:00	50.01	5	2	0	10	0.19996
332930003	07-SEP-2013 08:58:00	50.09	5	2	0	10	0.19964
332930004	07-SEP-2013 08:58:00	50.02	5	2	0	10	0.19992
332930005	07-SEP-2013 08:58:00	50.08	5	2	0	10	0.19968
332930006	07-SEP-2013 08:58:00	50	5	2	0	10	0.2
332930007	07-SEP-2013 08:58:00	50.08	5	2	0	10	0.19968
332930008	07-SEP-2013 08:58:00	50.09	5	2	0	10	0.19964
332930009	07-SEP-2013 08:58:00	50.03	5	2	0	10	0.19988
332930010	07-SEP-2013 08:58:00	50.05	5	2	0	10	0.1998
332930011	07-SEP-2013 08:58:00	50	5	2	0	10	0.2
332930012	07-SEP-2013 08:58:00	50.01	5	2	0	10	0.19996
332930013	07-SEP-2013 08:58:00	50.01	5	2	0	10	0.19996
332930014	07-SEP-2013 08:58:00	50	5	2	0	10	0.2
332930015	07-SEP-2013 08:58:00	50.06	5	2	0	10	0.19976

Type	Sample Id	Description	Serial Number	Spike Amt	Units	Comments:
LCS	1202943106	HERBICIDE LCS	WE130820-04	1	mL	Diazald used for this batch was 1952287
MS	1202943107	HERBICIDE LCS	WE130820-04	1	mL	Clean up Date: 10-SEP-2013 23:20:35
MSD	1202943108	HERBICIDE LCS	WE130820-04	1	mL	Hydrolysis Analyst: Sharlene Robinson
SURR	All	HERBICIDE SURROGATE	WE130820-03	.05	mL	Hydrolysis Date: 10-SEP-2013 23:20:35
REGNT	All	37g KOH to 100mL DI H2O	130322A	5	mL	Verified By: AV
REGNT	All	Methylene Chloride	1946152-D	280	mL	Final Solvent: Hexane
REGNT	All	Acetone	1949776-B1	20	mL	
REGNT	All	Hexane	1949780-B4	54	mL	
REGNT	All	Iso-octane	1950022-A	1	mL	
REGNT	All	acidified sodium sulfate	1952499	50	g	
REGNT	All	Methanol	1959405-C	.5	mL	

Prep Logbook

Batch ID: 1329319 **Verified by:** _____
Analyst: Matthew Selepack
Method: SW846 8151A

Lab SOP: GL-OA-E-027 REV# 14
Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Aliquot (g)	Initial pH	Int Ext pH	Sec Ext pH	Prepped Aliquot (mL)	Prepped Factor (mL/g)
REGNT All	N-METHYL-N-NITROSO-P-TOLUENESULFON-AMIDE			1961991A		2	mL
REGNT All	Sulfuric Acid Sol., 12N For Herbicides			1961993		17	mL
REGNT All	Ethyl ether			UN1950018a		80	mL
WORK All	HERBICIDE SURROGATE			WE130820-03		.05	mL

Metals Analysis

Case Narrative

**Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0010**

Sample Analysis

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
332930016	J1RWT5
1202943661	Method Blank (MB) ICP
1202943662	Laboratory Control Sample (LCS)
1202943665	332930001(J1RWR0L) Serial Dilution (SD)
1202943663	332930001(J1RWR0D) Sample Duplicate (DUP)
1202943664	332930001(J1RWR0S) Matrix Spike (MS)
1202947649	332930001(J1RWR0PS) Post Spike (PS)
1202943043	Method Blank (MB) ICP-MS
1202943044	Laboratory Control Sample (LCS)
1202943050	332930001(J1RWR0L) Serial Dilution (SD)
1202943048	332930001(J1RWR0D) Sample Duplicate (DUP)
1202943049	332930001(J1RWR0S) Matrix Spike (MS)
1202945530	Method Blank (MB) CVAA
1202945531	Laboratory Control Sample (LCS)
1202945534	332930001(J1RWR0L) Serial Dilution (SD)
1202945532	332930001(J1RWR0D) Sample Duplicate (DUP)
1202945533	332930001(J1RWR0S) Matrix Spike (MS)

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

Method/Analysis Information

Analytical Batch: 1329550, 1329295 and 1330275
Prep Batch : 1329548, 1329294 and 1330274
Standard Operating Procedures: GL-MA-E-013 REV# 22, GL-MA-E-009 REV# 22, GL-MA-E-014 REV# 25 and GL-MA-E-010 REV# 26
Analytical Method: SW846 3050B/6010C, SW846 3050B/6020A and SW846 7471B
Prep Method : SW846 3050B and SW846 7471B Prep

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a P E 5300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 6100E inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadrupole mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

The Metals analysis-Mercury was performed on a Perkin-Elmer Flow Injection Mercury System (FIMS-100) automated mercury analyzer. The instrument consists of a cold vapor atomic absorption spectrometer set to detect mercury at a wavelength of 253.7 nm. Sample introduction

through the flow injection system is performed via a peristaltic pump at 9 mL/min and nitrogen carrier gas rate of 80 mL/min.

Calibration Information

Instrument Calibration

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

CRDL Requirements

All CRDL standard(s) met the referenced advisory control limits.

ICSA/ICSAB Statement

All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements

All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements

All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement

The following samples were selected as the quality control (QC) samples for this SDG: 332930001 (J1RWR0)-ICP, ICP-MS and CVAA.

Matrix Spike (MS) Recovery Statement

The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS did not meet the recommended quality control acceptance criteria for percent recoveries for all applicable analytes. The silicon recovery was below the acceptance limits. See DER ID 1221504 behind the case narrative in this data package.

Duplicate Relative Percent Difference (RPD) Statement

The relative percent difference (RPD) obtained from the designated sample duplicate (DUP) is evaluated based on acceptance criteria of 20% when the sample is >5X the contract required reporting limit (RL). In cases where either the sample or duplicate value is less than 5X the contract required detection limit (RL), a control of +/-RL is used to evaluate the DUP results. All

applicable analytes did not meet these requirements. The calcium RPD result was above the acceptance criteria. See DER ID 1221504 behind the case narrative in this data package.

Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the PS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The PS met the recommended quality control acceptance criteria for percent recoveries for all applicable analytes and verifies the absence of matrix interferences.

Serial Dilution % Difference Statement

The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL/MDL for CVAA, 50X the IDL/MDL for ICP, and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

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. Method SW-846 3050B is not a total digestion technique for most samples. It is a very strong acid digestion that will dissolve almost all elements that could become environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Sample Dilutions

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. Samples 332930001 (J1RWR0), 332930003 (J1RWR2), 332930004 (J1RWR3), 332930005 (J1RWR4), 332930006 (J1RWR5), 332930008 (J1RWR7), 332930009 (J1RWR8), 332930010 (J1RWR9), 332930012 (J1RWT1), 332930013 (J1RWT2) and 332930014 (J1RWT3)-ICP required dilutions because target analyte concentrations exceeded the linear calibration range of the instrument.

Dilutions were also required for samples 332930001 (J1RWR0), 332930003 (J1RWR2), 332930004 (J1RWR3), 332930005 (J1RWR4), 332930006 (J1RWR5), 332930008 (J1RWR7), 332930009 (J1RWR8), 332930010 (J1RWR9), 332930012 (J1RWT1), 332930013 (J1RWT2) and 332930014 (J1RWT3)-ICP due to high concentrations of titanium that affect the analysis of antimony, cobalt, lead, vanadium, and zinc. Dilutions were performed to ensure that the inter-element correction factors were valid.

Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte concentrations into the linear calibration range of the instrument. The samples in this SDG were diluted the standard 2x for solids on the ICPMS.

Preparation Information

The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to 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. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. 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 reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. Data exception report (DER ID 1221504) was generated for this SDG.

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.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer: Pat Stelle Date: 9/16/2013

DATA EXCEPTION REPORT

Mo.Day Yr. 13-SEP-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ICP	Test / Method: SW846 3050B/6010C	Matrix Type: Solid	Client Code: WCHN
Batch ID: 1329550	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 332930(XP0010)			
Application Issues: Failed Recovery for MS/PS Failed RPD for DUP			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Failed Recovery for MS/PS: QC 1202943664MS</p> <p>2. Failed RPD for DUP: QC 1202943663DUP</p>		<p>1. The matrix spike recovery failed outside of the control limits for silicon. The post spike passed the required control limits for all analytes. This verifies the absence of a matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p> <p>2. The sample and sample duplicate % RPD failed outside the control limits for calcium due to possible sample non-homogeneity and/or matrix interference. Per GEL's accredited methods and SOPs, a corrective action is not required and the data is qualified and reported.</p>	

Originator's Name:
Helen Camello 13-SEP-13

Data Validator/Group Leader:
Jerry Wigfall 13-SEP-13

Sample Data Summary

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Qualifier Definition Report for

WCHN001 WC-HANFORD, INC.

Client SDG: XP0010 GEL Work Order: 332930 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- B 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).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was ≤ 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- N Spike 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.

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by

Pat Stelle 9/16/2013

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO	Project: WCHN00213
Sample ID: 332930001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:19	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .355%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	B	0.00681	0.004	0.0119	mg/kg	1	NOR1	09/12/13	1226	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		4810	6.68	19.6	mg/kg	1	HSC	09/13/13	1417	1329550	2
Arsenic	BC	2.89	0.491	2.95	mg/kg	1					
Barium		48.3	0.0982	0.491	mg/kg	1					
Beryllium	B	0.441	0.0982	0.491	mg/kg	1					
Boron	B	2.09	0.982	4.91	mg/kg	1					
Cadmium	B	0.107	0.0982	0.491	mg/kg	1					
Calcium	*	4720	7.86	24.5	mg/kg	1					
Chromium		9.24	0.147	0.491	mg/kg	1					
Cobalt		4.86	0.147	0.491	mg/kg	1					
Copper		11.5	0.295	0.982	mg/kg	1					
Iron		15000	7.86	24.5	mg/kg	1					
Lead		4.33	0.324	0.982	mg/kg	1					
Magnesium		3670	8.35	29.5	mg/kg	1					
Manganese		208	0.196	0.982	mg/kg	1					
Molybdenum	B	0.407	0.196	0.982	mg/kg	1					
Nickel		8.94	0.147	0.491	mg/kg	1					
Potassium		970	6.28	24.5	mg/kg	1					
Silicon	N	279	1.47	9.82	mg/kg	1					
Silver	U	0.0982	0.0982	0.491	mg/kg	1					
Sodium		297	6.87	24.5	mg/kg	1					
Vanadium		36.9	0.0982	0.491	mg/kg	1					
Zinc		32.7	0.393	0.982	mg/kg	1					
Antimony	DU	1.62	1.62	4.91	mg/kg	5	HSC	09/13/13	1606	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.322	0.322	1.00	mg/kg	2	SKJ	09/12/13	0205	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO
Sample ID: 332930001

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1
 Sample ID: 332930002
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:25
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .755%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00386	0.00386	0.0115	mg/kg	1	NOR1	09/12/13	1236	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		4310	6.61	19.5	mg/kg	1	HSC	09/13/13	1437	1329550	2
Arsenic	BC	2.28	0.486	2.92	mg/kg	1					
Barium		36.6	0.0973	0.486	mg/kg	1					
Beryllium	B	0.359	0.0973	0.486	mg/kg	1					
Boron	U	0.973	0.973	4.86	mg/kg	1					
Cadmium	U	0.0973	0.0973	0.486	mg/kg	1					
Calcium	*	2970	7.78	24.3	mg/kg	1					
Chromium		7.05	0.146	0.486	mg/kg	1					
Cobalt		4.29	0.146	0.486	mg/kg	1					
Copper		11.0	0.292	0.973	mg/kg	1					
Iron		12600	7.78	24.3	mg/kg	1					
Lead		2.73	0.321	0.973	mg/kg	1					
Magnesium		3030	8.27	29.2	mg/kg	1					
Manganese		169	0.195	0.973	mg/kg	1					
Molybdenum	B	0.264	0.195	0.973	mg/kg	1					
Nickel		8.28	0.146	0.486	mg/kg	1					
Potassium		927	6.22	24.3	mg/kg	1					
Silicon	N	275	1.46	9.73	mg/kg	1					
Silver	U	0.0973	0.0973	0.486	mg/kg	1					
Sodium		178	6.81	24.3	mg/kg	1					
Vanadium		30.8	0.0973	0.486	mg/kg	1					
Zinc		23.2	0.389	0.973	mg/kg	1					
Antimony	B	0.353	0.321	0.973	mg/kg	1	HSC	09/13/13	1709	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.302	0.302	1.00	mg/kg	2	SKJ	09/12/13	0255	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1
Sample ID: 332930002

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2	Project: WCHN00213
Sample ID: 332930003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:30	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .466%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00391	0.00391	0.0117	mg/kg	1	NOR1	09/12/13	1237	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		5020	6.68	19.7	mg/kg	1	HSC	09/13/13	1440	1329550	2
Arsenic	BC	2.90	0.492	2.95	mg/kg	1					
Barium		51.2	0.0983	0.492	mg/kg	1					
Beryllium		0.502	0.0983	0.492	mg/kg	1					
Boron	B	2.03	0.983	4.92	mg/kg	1					
Cadmium	B	0.146	0.0983	0.492	mg/kg	1					
Calcium	*	3840	7.86	24.6	mg/kg	1					
Chromium		9.64	0.147	0.492	mg/kg	1					
Copper		10.8	0.295	0.983	mg/kg	1					
Iron		16300	7.86	24.6	mg/kg	1					
Magnesium		4000	8.36	29.5	mg/kg	1					
Manganese		227	0.197	0.983	mg/kg	1					
Molybdenum	B	0.426	0.197	0.983	mg/kg	1					
Nickel		10.8	0.147	0.492	mg/kg	1					
Potassium		1150	6.29	24.6	mg/kg	1					
Silicon	N	275	1.47	9.83	mg/kg	1					
Silver	U	0.0983	0.0983	0.492	mg/kg	1					
Sodium		109	6.88	24.6	mg/kg	1					
Antimony	DU	1.62	1.62	4.92	mg/kg	5	HSC	09/13/13	1629	1329550	3
Cobalt	D	5.71	0.737	2.46	mg/kg	5	HSC	09/13/13	1547	1329550	4
Lead	BD	4.82	1.62	4.92	mg/kg	5					
Vanadium	D	43.7	0.492	2.46	mg/kg	5					
Zinc	D	93.7	1.97	4.92	mg/kg	5					

Metals Analysis-ICP-MS

SW846 3050B/6020A Selenium "Dry Weight Corrected"

Selenium	DU	0.328	0.328	1.00	mg/kg	2	SKJ	09/12/13	0302	1329295	5
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2
Sample ID: 332930003

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR3
Sample ID: 332930004

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR4
Sample ID: 332930005

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
Sample ID: 332930006
Matrix: SOIL
Collect Date: 05-SEP-13 07:55
Receive Date: 06-SEP-13
Collector: Client
Moisture: .649%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00388	0.00388	0.0116	mg/kg	1	NOR1	09/12/13	1242	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		5250	6.79	20.0	mg/kg	1	HSC	09/13/13	1448	1329550	2
Arsenic	C	3.56	0.499	3.00	mg/kg	1					
Barium		44.8	0.0999	0.499	mg/kg	1					
Beryllium		0.522	0.0999	0.499	mg/kg	1					
Boron	B	1.27	0.999	4.99	mg/kg	1					
Cadmium	B	0.162	0.0999	0.499	mg/kg	1					
Calcium	*	4270	7.99	25.0	mg/kg	1					
Chromium		11.3	0.150	0.499	mg/kg	1					
Copper		13.2	0.300	0.999	mg/kg	1					
Iron		18700	7.99	25.0	mg/kg	1					
Magnesium		4370	8.49	30.0	mg/kg	1					
Manganese		223	0.200	0.999	mg/kg	1					
Molybdenum		1.21	0.200	0.999	mg/kg	1					
Nickel		81.3	0.150	0.499	mg/kg	1					
Potassium		989	6.39	25.0	mg/kg	1					
Silicon	N	279	1.50	9.99	mg/kg	1					
Silver	U	0.0999	0.0999	0.499	mg/kg	1					
Sodium		130	6.99	25.0	mg/kg	1					
Antimony	DU	1.65	1.65	4.99	mg/kg	5	HSC	09/13/13	1637	1329550	3
Cobalt	D	7.12	0.749	2.50	mg/kg	5	HSC	09/13/13	1556	1329550	4
Lead	D	5.37	1.65	4.99	mg/kg	5					
Vanadium	D	48.1	0.499	2.50	mg/kg	5					
Zinc	D	35.6	2.00	4.99	mg/kg	5					

Metals Analysis-ICP-MS

SW846 3050B/6020A Selenium "Dry Weight Corrected"

Selenium DU 0.330 0.330 1.00 mg/kg 2 SKJ 09/12/13 0320 1329295 5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5
Sample ID: 332930006

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6
Sample ID: 332930007
Matrix: SOIL
Collect Date: 05-SEP-13 08:13
Receive Date: 06-SEP-13
Collector: Client
Moisture: .479%

Project: WCHN00213
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	B	0.00922	0.00396	0.0118	mg/kg	1	NOR1	09/12/13	1244	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		7450	6.63	19.5	mg/kg	1	HSC	09/13/13	1450	1329550	2
Arsenic		4.88	0.488	2.93	mg/kg	1					
Barium		75.3	0.0976	0.488	mg/kg	1					
Beryllium	B	0.475	0.0976	0.488	mg/kg	1					
Boron	B	1.24	0.976	4.88	mg/kg	1					
Cadmium	U	0.0976	0.0976	0.488	mg/kg	1					
Calcium	*	11600	7.80	24.4	mg/kg	1					
Chromium		16.7	0.146	0.488	mg/kg	1					
Cobalt		6.90	0.146	0.488	mg/kg	1					
Copper		21.6	0.293	0.976	mg/kg	1					
Iron		18900	7.80	24.4	mg/kg	1					
Lead		5.69	0.322	0.976	mg/kg	1					
Magnesium		6390	8.29	29.3	mg/kg	1					
Manganese		306	0.195	0.976	mg/kg	1					
Molybdenum	B	0.378	0.195	0.976	mg/kg	1					
Nickel		14.5	0.146	0.488	mg/kg	1					
Potassium		759	6.24	24.4	mg/kg	1					
Silicon	N	274	1.46	9.76	mg/kg	1					
Silver	U	0.0976	0.0976	0.488	mg/kg	1					
Sodium		365	6.83	24.4	mg/kg	1					
Vanadium		43.5	0.0976	0.488	mg/kg	1					
Zinc		39.1	0.390	0.976	mg/kg	1					
Antimony	U	0.322	0.322	0.976	mg/kg	1	HSC	09/13/13	1711	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.313	0.313	1.00	mg/kg	2	SKJ	09/12/13	0346	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6
Sample ID: 332930007

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7	Project: WCHN00213
Sample ID: 332930008	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:23	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .95%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00352	0.00352	0.0105	mg/kg	1	NOR1	09/12/13	1246	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		7190	6.60	19.4	mg/kg	1	HSC	09/13/13	1453	1329550	2
Arsenic	C	3.26	0.485	2.91	mg/kg	1					
Barium		78.3	0.0971	0.485	mg/kg	1					
Beryllium		0.708	0.0971	0.485	mg/kg	1					
Boron	B	1.48	0.971	4.85	mg/kg	1					
Cadmium	B	0.134	0.0971	0.485	mg/kg	1					
Calcium	*	3570	7.77	24.3	mg/kg	1					
Chromium		12.8	0.146	0.485	mg/kg	1					
Copper		14.5	0.291	0.971	mg/kg	1					
Iron		23100	7.77	24.3	mg/kg	1					
Magnesium		4520	8.25	29.1	mg/kg	1					
Manganese		340	0.194	0.971	mg/kg	1					
Molybdenum	B	0.500	0.194	0.971	mg/kg	1					
Nickel		12.0	0.146	0.485	mg/kg	1					
Potassium		1560	6.21	24.3	mg/kg	1					
Silicon	N	294	1.46	9.71	mg/kg	1					
Silver	U	0.0971	0.0971	0.485	mg/kg	1					
Sodium		115	6.80	24.3	mg/kg	1					
Antimony	DU	1.60	1.60	4.85	mg/kg	5	HSC	09/13/13	1642	1329550	3
Cobalt	D	8.55	0.728	2.43	mg/kg	5	HSC	09/13/13	1559	1329550	4
Lead	D	7.41	1.60	4.85	mg/kg	5					
Vanadium	D	60.5	0.485	2.43	mg/kg	5					
Zinc	D	45.0	1.94	4.85	mg/kg	5					

Metals Analysis-ICP-MS

SW846 3050B/6020A Selenium "Dry Weight Corrected"

Selenium	DU	0.324	0.324	1.00	mg/kg	2	SKJ	09/12/13	0352	1329295	5
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7
Sample ID: 332930008

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

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Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8 Project: WCHN00213
 Sample ID: 332930009 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:30
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .539%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	B	0.00461	0.00396	0.0118	mg/kg	1	NOR1	09/12/13	1251	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		6740	6.65	19.6	mg/kg	1	HSC	09/13/13	1455	1329550	2
Arsenic		4.12	0.489	2.93	mg/kg	1					
Barium		74.5	0.0978	0.489	mg/kg	1					
Beryllium		0.530	0.0978	0.489	mg/kg	1					
Boron	B	1.33	0.978	4.89	mg/kg	1					
Cadmium	B	0.148	0.0978	0.489	mg/kg	1					
Calcium	*	8290	7.82	24.5	mg/kg	1					
Chromium		14.7	0.147	0.489	mg/kg	1					
Copper		20.4	0.293	0.978	mg/kg	1					
Iron		19100	7.82	24.5	mg/kg	1					
Magnesium		5300	8.31	29.3	mg/kg	1					
Manganese		292	0.196	0.978	mg/kg	1					
Molybdenum	B	0.577	0.196	0.978	mg/kg	1					
Nickel		13.2	0.147	0.489	mg/kg	1					
Potassium		940	6.26	24.5	mg/kg	1					
Silicon	N	280	1.47	9.78	mg/kg	1					
Silver	U	0.0978	0.0978	0.489	mg/kg	1					
Sodium		194	6.85	24.5	mg/kg	1					
Antimony	DU	1.61	1.61	4.89	mg/kg	5	HSC	09/13/13	1644	1329550	3
Cobalt	D	7.31	0.734	2.45	mg/kg	5	HSC	09/13/13	1602	1329550	4
Lead	D	4.97	1.61	4.89	mg/kg	5					
Vanadium	D	51.1	0.489	2.45	mg/kg	5					
Zinc	D	41.9	1.96	4.89	mg/kg	5					

Metals Analysis-ICP-MS

SW846 3050B/6020A Selenium "Dry Weight Corrected"

Selenium	DU	0.297	0.297	1.00	mg/kg	2	SKJ	09/12/13	0358	1329295	5
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8
Sample ID: 332930009

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

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Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
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Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9
Sample ID: 332930010

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

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Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
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 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0 Project: WCHN00213
 Sample ID: 332930011 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 08:41
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .287%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00383	0.00383	0.0114	mg/kg	1	NOR1	09/12/13	1254	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		5340	6.46	19.0	mg/kg	1	HSC	09/13/13	1507	1329550	2
Arsenic	C	2.85	0.475	2.85	mg/kg	1					
Barium		43.4	0.095	0.475	mg/kg	1					
Beryllium	B	0.437	0.095	0.475	mg/kg	1					
Boron	U	0.950	0.950	4.75	mg/kg	1					
Cadmium	B	0.095	0.095	0.475	mg/kg	1					
Calcium	*	4820	7.60	23.7	mg/kg	1					
Chromium		11.2	0.142	0.475	mg/kg	1					
Cobalt		4.81	0.142	0.475	mg/kg	1					
Copper		11.5	0.285	0.950	mg/kg	1					
Iron		16000	7.60	23.7	mg/kg	1					
Lead		4.06	0.313	0.950	mg/kg	1					
Magnesium		4040	8.07	28.5	mg/kg	1					
Manganese		239	0.190	0.950	mg/kg	1					
Molybdenum	B	0.446	0.190	0.950	mg/kg	1					
Nickel		9.55	0.142	0.475	mg/kg	1					
Potassium		864	6.08	23.7	mg/kg	1					
Silicon	N	271	1.42	9.50	mg/kg	1					
Silver	U	0.095	0.095	0.475	mg/kg	1					
Sodium		78.3	6.65	23.7	mg/kg	1					
Vanadium		36.7	0.095	0.475	mg/kg	1					
Zinc		31.1	0.380	0.950	mg/kg	1					
Antimony	U	0.313	0.313	0.950	mg/kg	1	HSC	09/13/13	1713	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.313	0.313	1.00	mg/kg	2	SKJ	09/12/13	0411	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0
Sample ID: 332930011

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT1
Sample ID: 332930012

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2
Sample ID: 332930013

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3 Project: WCHN00213
 Sample ID: 332930014 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 09:43
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: 3.06%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury		0.0237	0.0038	0.0113	mg/kg	1	NOR1	09/12/13	1259	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		7150	6.76	19.9	mg/kg	1	HSC	09/13/13	1515	1329550	2
Arsenic		4.13	0.497	2.98	mg/kg	1					
Barium		79.0	0.0994	0.497	mg/kg	1					
Beryllium		0.572	0.0994	0.497	mg/kg	1					
Boron	B	1.71	0.994	4.97	mg/kg	1					
Cadmium	B	0.149	0.0994	0.497	mg/kg	1					
Calcium	*	4110	7.95	24.8	mg/kg	1					
Chromium		13.2	0.149	0.497	mg/kg	1					
Copper		14.8	0.298	0.994	mg/kg	1					
Iron		19600	7.95	24.8	mg/kg	1					
Magnesium		4380	8.45	29.8	mg/kg	1					
Manganese		307	0.199	0.994	mg/kg	1					
Molybdenum	B	0.518	0.199	0.994	mg/kg	1					
Nickel		11.2	0.149	0.497	mg/kg	1					
Potassium		1700	6.36	24.8	mg/kg	1					
Silicon	N	323	1.49	9.94	mg/kg	1					
Silver	B	0.167	0.0994	0.497	mg/kg	1					
Sodium		139	6.96	24.8	mg/kg	1					
Antimony	DU	1.64	1.64	4.97	mg/kg	5	HSC	09/13/13	1705	1329550	3
Cobalt	D	7.02	0.745	2.48	mg/kg	5	HSC	09/13/13	1615	1329550	4
Lead	D	23.1	1.64	4.97	mg/kg	5					
Vanadium	D	48.3	0.497	2.48	mg/kg	5					
Zinc	D	55.7	1.99	4.97	mg/kg	5					

Metals Analysis-ICP-MS

SW846 3050B/6020A Selenium "Dry Weight Corrected"

Selenium	DU	0.325	0.325	1.00	mg/kg	2	SKJ	09/12/13	0448	1329295	5
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The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3
Sample ID: 332930014

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6010C	
5	SW846 3050B/6020A	

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Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT4 Project: WCHN00213
 Sample ID: 332930015 Client ID: WCHN001
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:19
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: .385%

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00404	0.00404	0.012	mg/kg	1	NOR1	09/12/13	1301	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		4950	6.75	19.8	mg/kg	1	HSC	09/13/13	1518	1329550	2
Arsenic	BC	2.44	0.496	2.98	mg/kg	1					
Barium		47.8	0.0992	0.496	mg/kg	1					
Beryllium	B	0.430	0.0992	0.496	mg/kg	1					
Boron	B	1.97	0.992	4.96	mg/kg	1					
Cadmium	U	0.0992	0.0992	0.496	mg/kg	1					
Calcium	*	4030	7.94	24.8	mg/kg	1					
Chromium		9.27	0.149	0.496	mg/kg	1					
Cobalt		4.55	0.149	0.496	mg/kg	1					
Copper		11.3	0.298	0.992	mg/kg	1					
Iron		14800	7.94	24.8	mg/kg	1					
Lead		3.70	0.327	0.992	mg/kg	1					
Magnesium		3710	8.43	29.8	mg/kg	1					
Manganese		207	0.198	0.992	mg/kg	1					
Molybdenum	B	0.323	0.198	0.992	mg/kg	1					
Nickel		8.57	0.149	0.496	mg/kg	1					
Potassium		1030	6.35	24.8	mg/kg	1					
Silicon	N	299	1.49	9.92	mg/kg	1					
Silver	U	0.0992	0.0992	0.496	mg/kg	1					
Sodium		300	6.94	24.8	mg/kg	1					
Vanadium		35.8	0.0992	0.496	mg/kg	1					
Zinc		33.4	0.397	0.992	mg/kg	1					
Antimony	U	0.327	0.327	0.992	mg/kg	1	HSC	09/13/13	1715	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.289	0.289	1.00	mg/kg	2	SKJ	09/12/13	0455	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT4
Sample ID: 332930015

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT5	Project: WCHN00213
Sample ID: 332930016	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:10	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: <0.1%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA											
SW846 7471B Mercury in Solid "Dry Weight Corrected"											
Mercury	U	0.00377	0.00377	0.0113	mg/kg	1	NOR1	09/12/13	1303	1330275	1
Metals Analysis-ICP											
ICP METALS 6010TR Close-out List "Dry Weight Corrected"											
Aluminum		115	6.17	18.1	mg/kg	1	HSC	09/13/13	1520	1329550	2
Arsenic	BC	0.491	0.454	2.72	mg/kg	1					
Barium		1.60	0.0907	0.454	mg/kg	1					
Beryllium	U	0.0907	0.0907	0.454	mg/kg	1					
Boron	U	0.907	0.907	4.54	mg/kg	1					
Cadmium	U	0.0907	0.0907	0.454	mg/kg	1					
Calcium	*	32.6	7.26	22.7	mg/kg	1					
Chromium	U	0.136	0.136	0.454	mg/kg	1					
Cobalt	U	0.136	0.136	0.454	mg/kg	1					
Copper	U	0.272	0.272	0.907	mg/kg	1					
Iron		259	7.26	22.7	mg/kg	1					
Lead	B	0.513	0.299	0.907	mg/kg	1					
Magnesium	B	19.6	7.71	27.2	mg/kg	1					
Manganese		5.52	0.181	0.907	mg/kg	1					
Molybdenum	U	0.181	0.181	0.907	mg/kg	1					
Nickel	B	0.153	0.136	0.454	mg/kg	1					
Potassium		37.5	5.81	22.7	mg/kg	1					
Silicon	N	139	1.36	9.07	mg/kg	1					
Silver	U	0.0907	0.0907	0.454	mg/kg	1					
Sodium	U	6.35	6.35	22.7	mg/kg	1					
Vanadium	B	0.226	0.0907	0.454	mg/kg	1					
Zinc	B	0.807	0.363	0.907	mg/kg	1					
Antimony	U	0.299	0.299	0.907	mg/kg	1	HSC	09/13/13	1718	1329550	3
Metals Analysis-ICP-MS											
SW846 3050B/6020A Selenium "Dry Weight Corrected"											
Selenium	DU	0.296	0.296	1.00	mg/kg	2	SKJ	09/12/13	0501	1329295	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3050B	ICP-MS 3050BS PREP	AXG2	09/11/13	0815	1329294
SW846 3050B	SW846 3050B Prep for 6010C	AXG2	09/13/13	0825	1329548
SW846 7471B Prep	SW846 7471B Mercury Prep Soil	AXS5	09/11/13	1715	1330274

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Certificate of Analysis

Report Date: September 14, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT5
Sample ID: 332930016

Project: WCHN00213
Client ID: WCHN001

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7471B	
2	SW846 3050B/6010C	
3	SW846 3050B/6010C	
4	SW846 3050B/6020A	

Notes:

Quality Control Summary

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QC Summary

Report Date: September 14, 2013

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

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis - ICPMS											
Batch	1329295										
QC1202943048	332930001	DUP									
Selenium		DU	0.322	DU	0.295	mg/kg	N/A ^		SKJ	09/12/13	02:11
QC1202943044	LCS										
Selenium	4.73			D	4.57	mg/kg		96.6 (80%-120%)		09/12/13	01:46
QC1202943043	MB										
Selenium				DU	0.298	mg/kg				09/12/13	01:40
QC1202943049	332930001	MS									
Selenium	4.94	DU	0.322	D	4.51	mg/kg		91.2 (75%-125%)		09/12/13	02:18
QC1202943050	332930001	SDILT									
Selenium		DU	-0.258	DU	1.61	ug/L	N/A	(0%-10%)		09/12/13	02:30
Metals Analysis-ICP											
Batch	1329550										
QC1202943663	332930001	DUP									
Aluminum			4810		4840	mg/kg	0.610	(0%-20%)	HSC	09/13/13	14:19
Antimony		DU	1.62	DU	1.51	mg/kg	N/A ^			09/13/13	16:09
Arsenic		BC	2.89	C	3.13	mg/kg	7.83 ^	(+/-2.74)		09/13/13	14:19
Barium			48.3		50.9	mg/kg	5.15	(0%-20%)			
Beryllium		B	0.441	B	0.424	mg/kg	3.84 ^	(+/-0.457)			
Boron		B	2.09	B	1.93	mg/kg	8.30 ^	(+/-4.57)			
Cadmium		B	0.107	U	0.0914	mg/kg	38.9 ^	(+/-0.457)			
Calcium		*	4720	*	3680	mg/kg	24.6*	(0%-20%)			
Chromium			9.24		8.72	mg/kg	5.74	(0%-20%)			
Cobalt			4.86		5.00	mg/kg	2.99	(0%-20%)			
Copper			11.5		12.0	mg/kg	4.46	(0%-20%)			
Iron			15000		15300	mg/kg	1.95	(0%-20%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1329550										
Lead		4.33		4.31	mg/kg	0.444	^	(+/-0.914)	HSC	09/13/13	14:19
Magnesium		3670		3690	mg/kg	0.737		(0%-20%)			
Manganese		208		211	mg/kg	1.36		(0%-20%)			
Molybdenum	B	0.407	B	0.363	mg/kg	11.3	^	(+/-0.914)			
Nickel		8.94		9.19	mg/kg	2.76		(0%-20%)			
Potassium		970		1010	mg/kg	3.70		(0%-20%)			
Silicon	N	279		257	mg/kg	8.16		(0%-20%)			
Silver	U	0.0982	U	0.0914	mg/kg	N/A	^				
Sodium		297		284	mg/kg	4.73		(0%-20%)			
Vanadium		36.9		36.0	mg/kg	2.62		(0%-20%)			
Zinc		32.7		31.4	mg/kg	4.14		(0%-20%)			
QC1202943662	LCS										
Aluminum		466		481	mg/kg			103 (80%-120%)		09/13/13	14:13
Antimony		46.6		45.4	mg/kg			97.3 (80%-120%)		09/13/13	15:41
Arsenic		46.6		46.2	mg/kg			99.1 (80%-120%)		09/13/13	14:13
Barium		46.6		45.8	mg/kg			98.2 (80%-120%)			
Beryllium		46.6		47.3	mg/kg			101 (80%-120%)			
Boron		46.6		45.5	mg/kg			97.7 (80%-120%)			
Cadmium		46.6		47.6	mg/kg			102 (80%-120%)			
Calcium		466		486	mg/kg			104 (80%-120%)			
Chromium		46.6		44.5	mg/kg			95.4 (80%-120%)			
Cobalt		46.6		45.9	mg/kg			98.5 (80%-120%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1329550										
Copper	46.6			45.7	mg/kg		98	(80%-120%)	HSC	09/13/13	14:13
Iron	466			484	mg/kg		104	(80%-120%)			
Lead	46.6			46.5	mg/kg		99.7	(80%-120%)			
Magnesium	466			501	mg/kg		107	(80%-120%)			
Manganese	46.6			45.1	mg/kg		96.8	(80%-120%)			
Molybdenum	46.6			44.6	mg/kg		95.6	(80%-120%)			
Nickel	46.6			46.9	mg/kg		100	(80%-120%)			
Potassium	466			459	mg/kg		98.4	(80%-120%)			
Silicon	466			399	mg/kg		85.6	(80%-120%)			
Silver	46.6			47.0	mg/kg		101	(80%-120%)			
Sodium	466			460	mg/kg		98.7	(80%-120%)			
Vanadium	46.6			44.9	mg/kg		96.3	(80%-120%)			
Zinc	46.6			45.7	mg/kg		98	(80%-120%)			
QC1202943661	MB										
Aluminum			U	6.33	mg/kg					09/13/13	14:10
Antimony			U	0.307	mg/kg					09/13/13	15:38
Arsenic			B	0.788	mg/kg					09/13/13	14:10
Barium			U	0.0931	mg/kg						
Beryllium			U	0.0931	mg/kg						
Boron			U	0.931	mg/kg						
Cadmium			U	0.0931	mg/kg						
Calcium			U	7.45	mg/kg						

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1329550										
Chromium			U	0.140	mg/kg				HSC	09/13/13	14:10
Cobalt			U	0.140	mg/kg						
Copper			U	0.279	mg/kg						
Iron			U	7.45	mg/kg						
Lead			U	0.307	mg/kg						
Magnesium			U	7.91	mg/kg						
Manganese			U	0.186	mg/kg						
Molybdenum			U	0.186	mg/kg						
Nickel			U	0.140	mg/kg						
Potassium			U	5.96	mg/kg						
Silicon			U	1.40	mg/kg						
Silver			U	0.0931	mg/kg						
Sodium			U	6.52	mg/kg						
Vanadium			U	0.0931	mg/kg						
Zinc			U	0.372	mg/kg						
QC1202943664 332930001 MS											
Aluminum	482		4810	6310	mg/kg		N/A	(75%-125%)		09/13/13	14:22
Antimony	48.2	DU	1.62	D	43.6	mg/kg	88.6	(75%-125%)		09/13/13	16:12
Arsenic	48.2	BC	2.89		47.6	mg/kg	92.6	(75%-125%)		09/13/13	14:22
Barium	48.2		48.3		95.5	mg/kg	97.9	(75%-125%)			
Beryllium	48.2	B	0.441		46.0	mg/kg	94.5	(75%-125%)			
Boron	48.2	B	2.09		47.2	mg/kg	93.5	(75%-125%)			

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1329550										
Cadmium	48.2	B	0.107		46.2	mg/kg	95.5	(75%-125%)	HSC	09/13/13	14:22
Calcium	482	*	4720		4400	mg/kg	N/A	(75%-125%)			
Chromium	48.2		9.24		53.3	mg/kg	91.4	(75%-125%)			
Cobalt	48.2		4.86		48.6	mg/kg	90.7	(75%-125%)			
Copper	48.2		11.5		59.5	mg/kg	99.5	(75%-125%)			
Iron	482		15000		16100	mg/kg	N/A	(75%-125%)			
Lead	48.2		4.33		50.3	mg/kg	95.2	(75%-125%)			
Magnesium	482		3670		4320	mg/kg	N/A	(75%-125%)			
Manganese	48.2		208		265	mg/kg	N/A	(75%-125%)			
Molybdenum	48.2	B	0.407		44.7	mg/kg	91.7	(75%-125%)			
Nickel	48.2		8.94		53.6	mg/kg	92.5	(75%-125%)			
Potassium	482		970		1530	mg/kg	115	(75%-125%)			
Silicon	482	N	279	N	291	mg/kg	2.32*	(75%-125%)			
Silver	48.2	U	0.0982		47.4	mg/kg	98.2	(75%-125%)			
Sodium	482		297		748	mg/kg	93.4	(75%-125%)			
Vanadium	48.2		36.9		83.0	mg/kg	95.4	(75%-125%)			
Zinc	48.2		32.7		78.6	mg/kg	95.2	(75%-125%)			
QC1202947649 332930001 PS											
Silicon	5000	N	2840		7320	ug/L	89.5	(80%-120%)		09/13/13	14:25
QC1202943665 332930001 SDILT											
Aluminum			49000	D	10000	ug/L	2.59	(0%-10%)		09/13/13	14:27
Antimony		DU	1.67	DU	8.10	ug/L	N/A	(0%-10%)		09/13/13	16:17
Arsenic		BC	29.5	CD	11.3	ug/L	91.9	(0%-10%)		09/13/13	14:27

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch	1329550										
Barium		492	D	101	ug/L	2.76		(0%-10%)	HSC	09/13/13	14:27
Beryllium	B	4.49	D	1.02	ug/L	13.9		(0%-10%)			
Boron	B	21.3	DU	4.91	ug/L	N/A		(0%-10%)			
Cadmium	B	1.09	DU	0.491	ug/L	N/A		(0%-10%)			
Calcium	*	48000	D	9790	ug/L	1.88		(0%-10%)			
Chromium		94.1	D	19.1	ug/L	1.41		(0%-10%)			
Cobalt		49.5	D	10.3	ug/L	3.83		(0%-10%)			
Copper		117	D	22.5	ug/L	3.83		(0%-10%)			
Iron		153000	D	31800	ug/L	3.83		(0%-10%)			
Lead		44.0	D	5.12	ug/L	41.8		(0%-10%)			
Magnesium		37300	D	7690	ug/L	2.91		(0%-10%)			
Manganese		2120	D	443	ug/L	4.45		(0%-10%)			
Molybdenum	B	4.14	DU	0.982	ug/L	N/A		(0%-10%)			
Nickel		91.0	D	18.5	ug/L	1.69		(0%-10%)			
Potassium		9880	D	1980	ug/L	.00708		(0%-10%)			
Silicon	N	2840	D	569	ug/L	.0475		(0%-10%)			
Silver	U	0.269	DU	0.491	ug/L	N/A		(0%-10%)			
Sodium		3030	D	615	ug/L	1.58		(0%-10%)			
Vanadium		376	D	75.9	ug/L	.797		(0%-10%)			
Zinc		333	D	67.5	ug/L	1.37		(0%-10%)			

Metals Analysis-Mercury

Batch 1330275

GEL LABORATORIES LLC

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-Mercury											
Batch	1330275										
QC1202945532	332930001	DUP									
Mercury		B	0.00681	B	0.00675	mg/kg	0.897 ^	(+/-0.0117)	NOR1	09/12/13	12:31
QC1202945531	LCS										
Mercury	0.116				0.116	mg/kg		100	(80%-120%)	09/12/13	12:22
QC1202945530	MB										
Mercury				U	0.00393	mg/kg				09/12/13	12:21
QC1202945533	332930001	MS									
Mercury	0.116	B	0.00681		0.117	mg/kg		94.9	(80%-120%)	09/12/13	12:32
QC1202945534	332930001	SDILT									
Mercury		B	0.114	DU	0.020	ug/L	N/A		(0%-10%)	09/12/13	12:34

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B 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).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- 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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ 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

Acid Digestion of Sediments, Sludges, and Soils

Batch ID: 1329548.0	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Anthony Green	LCS	1202943662	Metals Spike Mix I	UI1943364-01	.25	mL
Method: SW846 3050B	LCS	1202943662	Metals Spike Mix II	UI1943367-06	.25	mL
Lab SOP: GL-MA-E-009 REV# 22	MS	1202943664	Metals Spike Mix I	UI1943364-01	.25	mL
Instrument: BAL-001	MS	1202943664	Metals Spike Mix II	UI1943367-06	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202943661 MB	13-SEP-2013 08:25:38	Soil	0.537	50	93.10987
1202943662 LCS	13-SEP-2013 08:25:38	Soil	0.536	50	93.28358
332930001	13-SEP-2013 08:25:38	Soil	0.511	50	97.84736
1202943663 DUP (332930001)	13-SEP-2013 08:25:38	Soil	0.549	50	91.07468
1202943664 MS (332930001)	13-SEP-2013 08:25:38	Soil	0.52	50	96.15385
1202943665 SDILT (332930001)	13-SEP-2013 08:25:38	Soil	0.511	50	97.84736
332930002	13-SEP-2013 08:25:38	Soil	0.518	50	96.5251
332930003	13-SEP-2013 08:25:38	Soil	0.511	50	97.84736
332930004	13-SEP-2013 08:25:38	Soil	0.511	50	97.84736
332930005	13-SEP-2013 08:25:38	Soil	0.541	50	92.42144
332930006	13-SEP-2013 08:25:38	Soil	0.504	50	99.20635
332930007	13-SEP-2013 08:25:38	Soil	0.515	50	97.08738
332930008	13-SEP-2013 08:25:38	Soil	0.52	50	96.15385
332930009	13-SEP-2013 08:25:38	Soil	0.514	50	97.27626
332930010	13-SEP-2013 08:25:38	Soil	0.53	50	94.33962
332930011	13-SEP-2013 08:25:38	Soil	0.528	50	94.69697
332930012	13-SEP-2013 08:25:38	Soil	0.535	50	93.45794
332930013	13-SEP-2013 08:25:38	Soil	0.504	50	99.20635
332930014	13-SEP-2013 08:25:38	Soil	0.519	50	96.33911
332930015	13-SEP-2013 08:25:38	Soil	0.506	50	98.81423
332930016	13-SEP-2013 08:25:38	Soil	0.551	50	90.7441

Reagent/Solvent Lot ID	Description	Amount	Comments:
1924940	Concentrated Nitric Acid	1.25 mL	Block Temperature: 95 C
1949994	HYDROCHLORIC ACID	10 mL	Thermometer ID: 119015 Hot Block ID: 13
			Sample 332930001 consist of light brown, sandy soil.

Prep Logbook

Batch ID: 1329548.0
Analyst: Anthony Green
Method: SW846 3050B
Lab SOP: GL-MA-E-009 REV# 22
Instrument: BAL-001

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202943662	Metals Spike Mix I	UI1943364-01	.25	mL
LCS	1202943662	Metals Spike Mix II	UI1943367-06	.25	mL
MS	1202943664	Metals Spike Mix I	UI1943364-01	.25	mL
MS	1202943664	Metals Spike Mix II	UI1943367-06	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
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Reagent/Solvent Lot ID	Description	Amount	Comments:
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Prep Logbook

Acid Digestion of Sediments, Sludges, and Soils

Batch ID:	1329294.0	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst:	Anthony Green	LCS	1202943044	ICP-MS spiking solution A	UI1936142-A	.25	mL
Method:	SW846 3050B	LCS	1202943044	ICP-MS spiking solution B	UI1936146-B	.25	mL
Lab SOP:	GL-MA-E-009 REV# 22	MS	1202943049	ICP-MS spiking solution A	UI1936142-A	.25	mL
Instrument:	Metals Manual Instrument	MS	1202943049	ICP-MS spiking solution B	UI1936146-B	.25	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202943043 MB	11-SEP-2013 08:15:26	Soil	0.553	50	90.41591
1202943044 LCS	11-SEP-2013 08:15:26	Soil	0.529	50	94.51796
332930001	11-SEP-2013 08:15:26	Soil	0.514	50	97.27626
1202943048 DUP (332930001)	11-SEP-2013 08:15:26	Soil	0.562	50	88.96797
1202943049 MS (332930001)	11-SEP-2013 08:15:26	Soil	0.508	50	98.4252
1202943050 SDILT (332930001)	11-SEP-2013 08:15:26	Soil	0.514	50	97.27626
332930002	11-SEP-2013 08:15:26	Soil	0.55	50	90.90909
332930003	11-SEP-2013 08:15:26	Soil	0.505	50	99.0099
332930004	11-SEP-2013 08:15:26	Soil	0.511	50	97.84736
332930005	11-SEP-2013 08:15:26	Soil	0.533	50	93.80863
332930006	11-SEP-2013 08:15:26	Soil	0.504	50	99.20635
332930007	11-SEP-2013 08:15:26	Soil	0.53	50	94.33962
332930008	11-SEP-2013 08:15:26	Soil	0.514	50	97.27626
332930009	11-SEP-2013 08:15:26	Soil	0.559	50	89.44544
332930010	11-SEP-2013 08:15:26	Soil	0.53	50	94.33962
332930011	11-SEP-2013 08:15:26	Soil	0.528	50	94.69697
332930012	11-SEP-2013 08:15:26	Soil	0.532	50	93.98496
332930013	11-SEP-2013 08:15:26	Soil	0.545	50	91.74312
332930014	11-SEP-2013 08:15:26	Soil	0.523	50	95.60229
332930015	11-SEP-2013 08:15:26	Soil	0.574	50	87.10801
332930016	11-SEP-2013 08:15:26	Soil	0.558	50	89.60573

Reagent/Solvent Lot ID	Description	Amount	Comments:
1904936-02	Hydrogen Peroxide 30%	1.5 mL	Block Temperature: 93 C
1924940	Concentrated Nitric Acid	5 mL	Thermometer ID: 119015 Hot Block ID: 13

Prep Logbook

Mercury Analysis Using the Perkin Elmer Automated Mercury Analyzer

Batch ID: 1330274.0	Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
Analyst: Alan Stanley	LCS	1202945531	MHGSOILMSSPIKE	WHG130911-14	.3	mL
Method: SW846 7471B Prep	MS	1202945533	MHGSOILMSSPIKE	WHG130911-14	.3	mL
Lab SOP: GL-MA-E-010 REV# 26	MS	1202945536	MHGSOILMSSPIKE	WHG130911-14	.3	mL
Instrument: Metals Manual Instrument	MSD	1202945537	MHGSOILMSSPIKE	WHG130911-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
1202945530 MB	11-SEP-2013 17:15:13	Soil	0.512	30	58.59375
1202945531 LCS	11-SEP-2013 17:15:13	Soil	0.518	30	57.91506
332901003	11-SEP-2013 17:15:13	Sludge	0.521	30	57.58157
332930001	11-SEP-2013 17:15:13	Soil	0.504	30	59.52381
1202945532 DUP (332930001)	11-SEP-2013 17:15:13	Soil	0.513	30	58.47953
1202945533 MS (332930001)	11-SEP-2013 17:15:13	Soil	0.517	30	58.02708
1202945534 SDILT (332930001)	11-SEP-2013 17:15:13	Soil	0.504	30	59.52381
332930002	11-SEP-2013 17:15:13	Soil	0.525	30	57.14286
332930003	11-SEP-2013 17:15:13	Soil	0.516	30	58.13953
332930004	11-SEP-2013 17:15:13	Soil	0.524	30	57.25191
332930005	11-SEP-2013 17:15:13	Soil	0.549	30	54.64481
332930006	11-SEP-2013 17:15:13	Soil	0.521	30	57.58157
332930007	11-SEP-2013 17:15:13	Soil	0.51	30	58.82353
332930008	11-SEP-2013 17:15:13	Soil	0.577	30	51.99307
332930009	11-SEP-2013 17:15:13	Soil	0.51	30	58.82353
332930010	11-SEP-2013 17:15:13	Soil	0.509	30	58.9391
332930011	11-SEP-2013 17:15:13	Soil	0.527	30	56.926
332930012	11-SEP-2013 17:15:13	Soil	0.515	30	58.25243
332930013	11-SEP-2013 17:15:13	Soil	0.516	30	58.13953
332930014	11-SEP-2013 17:15:13	Soil	0.546	30	54.94505
332930015	11-SEP-2013 17:15:13	Soil	0.5	30	60
332930016	11-SEP-2013 17:15:13	Soil	0.533	30	56.28518
333059001	11-SEP-2013 17:15:13	Misc Solid	0.513	30	58.47953
1202945535 SDILT (333059001)	11-SEP-2013 17:15:13	Soil	0.513	30	58.47953
1202945536 MS (333059001)	11-SEP-2013 17:15:13	Soil	0.515	30	58.25243
1202945537 MSD (333059001)	11-SEP-2013 17:15:13	Soil	0.504	30	59.52381

Prep Logbook

Batch ID: 1330274.0
Analyst: Alan Stanley
Method: SW846 7471B Prep
Lab SOP: GL-MA-E-010 REV# 26
Instrument: Metals Manual Instrument

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1202945531	MHGSOILMSSPIKE	WHG130911-14	.3	mL
MS	1202945533	MHGSOILMSSPIKE	WHG130911-14	.3	mL
MS	1202945536	MHGSOILMSSPIKE	WHG130911-14	.3	mL
MSD	1202945537	MHGSOILMSSPIKE	WHG130911-14	.3	mL

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)
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Reagent/Solvent Lot ID	Description	Amount	Comments:
130712-A	Hydrochloric Acid Conc.	1.125 mL	Digestion Start Date: 11-SEP-2013 17:16 Digestion End Date: 11-SEP-2013 17:46 Block Temperature: 95 C Thermometer ID: 126-AI Hot Block ID: 6
130717-1	NITRIC ACID	.375 mL	
1895265-C	Hg reducing agent	2 mL	
1952486-C	5% KMnO4 solution	7.5 mL	
WHG130911-07	Mercury Working Standard 1st Source CAL S 0.2/CRA	30 uL	
WHG130911-08	Mercury Working Standard 1st Source CAL S 0.5	75 uL	
WHG130911-09	Mercury Working 1st Source CAL S 2.0	300 uL	
WHG130911-10	Mercury Working 1st Source CAL S 5.0/CCV	750 uL	
WHG130911-11	Mercury Working 1st Source CAL S 10.0	1500 uL	
WHG130911-12	Mercury Working 2nd Source S 5.0/ICV	750 uL	

General Chem Analysis

Case Narrative

**General Chemistry Narrative
WC-HANFORD, INC. (WCHN)
SDG XP0010**

Method/Analysis Information

Product: pH
Analytical Batch: 1329945 **Method:** SW9045D pH

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9045D:

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202944697	Laboratory Control Sample (LCS)
1202944698	332930001(J1RWR0) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

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-GC-E-008 REV# 21.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Electrode analysis was performed on a PerpHect pH Meter Orion 370.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Quality Control (QC) Information

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 332930001 (J1RWR0).

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

The following samples from this sample group were received by the lab outside of the method specified holding time: 332930001 (J1RWR0), 332930002 (J1RWR1), 332930003 (J1RWR2), 332930004 (J1RWR3), 332930005 (J1RWR4), 332930006 (J1RWR5), 332930007 (J1RWR6), 332930008 (J1RWR7), 332930009 (J1RWR8), 332930010 (J1RWR9), 332930011 (J1RWT0), 332930012 (J1RWT1), 332930013 (J1RWT2), 332930014 (J1RWT3) and 332930015 (J1RWT4).

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1220367 332930001 (J1RWR0), 332930002 (J1RWR1), 332930003 (J1RWR2), 332930004 (J1RWR3), 332930005 (J1RWR4), 332930006 (J1RWR5), 332930007 (J1RWR6), 332930008 (J1RWR7), 332930009 (J1RWR8), 332930010 (J1RWR9), 332930011 (J1RWT0), 332930012 (J1RWT1), 332930013 (J1RWT2), 332930014 (J1RWT3) and 332930015 (J1RWT4).

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to 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.

Method/Analysis Information

Product: Ion Chromatography
Analytical Batch: 1329467 and 1329700 **Method:** SW846 9056A Anions
Prep Batch : 1329466 and 1329699 **Method:** SW846 9056A

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202943469	Method Blank (MB)
1202943470	332930007(J1RWR6) Sample Duplicate (DUP)
1202943471	332930007(J1RWR6) Matrix Spike (MS)
1202943472	Laboratory Control Sample (LCS)
1202944077	Method Blank (MB)
1202944078	332930008(J1RWR7) Sample Duplicate (DUP)
1202944079	332930008(J1RWR7) Matrix Spike (MS)
1202944080	Laboratory Control Sample (LCS)

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

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-GC-E-086 REV# 22.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-3000 Ion Chromatograph.

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration

All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)

All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation

The following samples were selected for QC analysis: 332930007 (J1RWR6)- Batch 1329467 and 332930008 (J1RWR7)- Batch 1329700.

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The samples in this SDG did not require dilutions.

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information**Data Exception (DER) Documentation**

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations

The following samples from this sample group had to be manually integrated due to errors in the instrument software peak integration: 1202943470 (J1RWR6), 332930002 (J1RWR1), 332930003 (J1RWR2), 332930005 (J1RWR4), 332930006 (J1RWR5), 332930007 (J1RWR6)- Batch 1329467, 1202944078 (J1RWR7), 332930010 (J1RWR9), 332930011 (J1RWT0), 332930012 (J1RWT1) and 332930015 (J1RWT4)- Batch 1329700.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to 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.

Method/Analysis Information

Product: Nitrate + Nitrite
Analytical Batch: 1329609 **Method:** EPA 353.2 Nitrogen and Nitrate/Nitrite
Prep Batch : 1329608 **Method:** EEPA 353.2 Modified

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 353.2 Modified:

Sample ID	Client ID
332930001	J1RWR0
332930002	J1RWR1
332930003	J1RWR2
332930004	J1RWR3
332930005	J1RWR4
332930006	J1RWR5
332930007	J1RWR6
332930008	J1RWR7
332930009	J1RWR8
332930010	J1RWR9
332930011	J1RWT0
332930012	J1RWT1
332930013	J1RWT2
332930014	J1RWT3
332930015	J1RWT4
1202943829	Method Blank (MB)
1202943831	332930001(J1RWR0) Sample Duplicate (DUP)
1202943833	332930001(J1RWR0) Matrix Spike (MS)
1202943834	Laboratory Control Sample (LCS)

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

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-GC-E-128 REV# 8.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Nutrient analysis was performed on a Lachat QuickChem FIA+ 8500 Series.

Calibration Verification Information

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

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule

The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement

The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery

The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation

The following sample was selected for QC analysis: 332930001 (J1RWR0).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement

One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1202943831 (J1RWR0).

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times

All samples in this SDG met the specified holding time.

Sample Dilutions

The following sample in this sample group was diluted due to high concentration: 332930013 (J1RWT2).

Sample Re-analysis

The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation

Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced

SOP or contractual documents.

Additional Comments

Additional comments were not required for this SDG.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to 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.

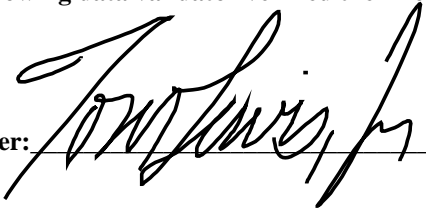
Certification Statement

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.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:  Date: 20Sept13

DATA EXCEPTION REPORT

Mo.Day Yr. 11-SEP-13	Division: Industrial	Quality Criteria: Specifications	Type: Process
Instrument Type: ELECTRODE	Test / Method: SW846 9045C/9045D, SW846 9045D	Matrix Type: Solid	Client Code: ERMC, LANL, WCHN
Batch ID: 1329945	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 332699(2013-1787),332930(XP0010),333023			
Application Issues: Sample received out of holding			
Specification and Requirements Exception Description:		DER Disposition:	
<p>1. Sample received out of holding:</p> <p>332699 001,002,003</p> <p>332930 001,002,003,004,005,006,007,008,009, 010,011,012,013,014,015</p> <p>333023 001,002</p> <p>QC 1202944698DUP,1202944699DUP</p>		<p>1. Sample received out of holding.</p>	

Originator's Name:

Lindsey Jensen 11-SEP-13

Data Validator/Group Leader:

Thomas Lewis 13-SEP-13

Sample Data Summary

GEL LABORATORIES LLC

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

**Certificate of Analysis Report
for**

WCHN001 WC-HANFORD, INC.

Client SDG: XP0010 GEL Work Order: 332930 Project: RC-232 Soil

The Qualifiers in this report are defined as follows:

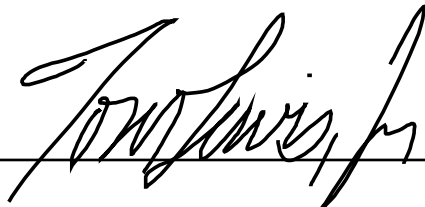
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

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 Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by



GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWRO	Project: WCHN00213
Sample ID: 332930001	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:19	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .355%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.0C	X	9.36	0.010	0.100	pH	1	LXA1	09/10/13	1226	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.672	0.672	2.01	mg/kg	1	MAR1	09/12/13	1142	1329467	2
Chloride		7.32	0.672	2.01	mg/kg	1					
Fluoride		2.40	0.331	1.00	mg/kg	1					
Nitrate-N		3.04	0.331	1.00	mg/kg	1					
Nitrite-N	U	0.331	0.331	1.00	mg/kg	1					
O-Phosphate as P	B	0.815	0.672	2.01	mg/kg	1					
Sulfate		40.2	1.33	4.01	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		2.06	0.172	0.506	mg/kg	1	KLP1	09/09/13	1607	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR1	Project: WCHN00213
Sample ID: 332930002	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:25	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .755%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.0C	X	9.14	0.010	0.100	pH	1	LXA1	09/10/13	1230	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.675	0.675	2.02	mg/kg	1	MAR1	09/12/13	1215	1329467	2
Chloride	B	1.15	0.675	2.02	mg/kg	1					
Fluoride	B	0.756	0.333	1.01	mg/kg	1					
Nitrate-N		1.05	0.333	1.01	mg/kg	1					
Nitrite-N	U	0.333	0.333	1.01	mg/kg	1					
O-Phosphate as P	U	0.675	0.675	2.02	mg/kg	1					
Sulfate		5.36	1.34	4.03	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		0.549	0.167	0.490	mg/kg	1	KLP1	09/09/13	1615	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR2	Project: WCHN00213
Sample ID: 332930003	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:30	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .466%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 20.8C	X	8.89	0.010	0.100	pH	1	LXA1	09/10/13	1232	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.673	0.673	2.01	mg/kg	1	MAR1	09/12/13	1248	1329467	2
Chloride	B	1.81	0.673	2.01	mg/kg	1					
Fluoride		1.57	0.332	1.00	mg/kg	1					
Nitrate-N		2.60	0.332	1.00	mg/kg	1					
Nitrite-N	U	0.332	0.332	1.00	mg/kg	1					
O-Phosphate as P	B	1.06	0.673	2.01	mg/kg	1					
Sulfate		8.10	1.34	4.02	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		1.78	0.170	0.500	mg/kg	1	KLP1	09/09/13	1617	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR3
 Sample ID: 332930004
 Matrix: SOIL
 Collect Date: 05-SEP-13 07:38
 Receive Date: 06-SEP-13
 Collector: Client
 Moisture: 2.94%

Project: WCHN00213
 Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.1C	X	8.94	0.010	0.100	pH	1	LXA1	09/10/13	1233	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.690	0.690	2.06	mg/kg	1	MAR1	09/12/13	1321	1329467	2
Chloride	B	2.01	0.690	2.06	mg/kg	1					
Fluoride	B	0.966	0.340	1.03	mg/kg	1					
Nitrate-N		2.07	0.340	1.03	mg/kg	1					
Nitrite-N	U	0.340	0.340	1.03	mg/kg	1					
O-Phosphate as P	B	1.73	0.690	2.06	mg/kg	1					
Sulfate		6.62	1.37	4.12	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		1.44	0.172	0.506	mg/kg	1	KLP1	09/09/13	1618	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR5	Project: WCHN00213
Sample ID: 332930006	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 07:55	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .649%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.5C	X	8.86	0.010	0.100	pH	1	LXA1	09/10/13	1423	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.674	0.674	2.01	mg/kg	1	MAR1	09/12/13	1427	1329467	2
Chloride	B	1.13	0.674	2.01	mg/kg	1					
Fluoride		1.80	0.332	1.01	mg/kg	1					
Nitrate-N	B	0.775	0.332	1.01	mg/kg	1					
Nitrite-N	U	0.332	0.332	1.01	mg/kg	1					
O-Phosphate as P	U	0.674	0.674	2.01	mg/kg	1					
Sulfate		4.35	1.34	4.03	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	B	0.465	0.171	0.502	mg/kg	1	KLP1	09/09/13	1620	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR6	Project: WCHN00213
Sample ID: 332930007	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:13	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .479%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.1C	X	9.32	0.010	0.100	pH	1	LXA1	09/10/13	1428	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.673	0.673	2.01	mg/kg	1	MAR1	09/12/13	1605	1329467	2
Chloride		2.23	0.673	2.01	mg/kg	1					
Fluoride		1.28	0.332	1.00	mg/kg	1					
Nitrate-N	B	0.566	0.332	1.00	mg/kg	1					
Nitrite-N	U	0.332	0.332	1.00	mg/kg	1					
O-Phosphate as P	U	0.673	0.673	2.01	mg/kg	1					
Sulfate		25.0	1.34	4.02	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	B	0.167	0.160	0.472	mg/kg	1	KLP1	09/09/13	1621	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	MAR1	09/12/13	0855	1329466

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
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 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR7	Project: WCHN00213
Sample ID: 332930008	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:23	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .95%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.0C	X	8.36	0.010	0.100	pH	1	LXA1	09/10/13	1429	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.663	0.663	1.98	mg/kg	1	DM	09/12/13	0404	1329700	2
Chloride		2.95	0.663	1.98	mg/kg	1					
Fluoride		1.00	0.327	0.990	mg/kg	1					
Nitrate-N		3.15	0.327	0.990	mg/kg	1					
Nitrite-N	U	0.327	0.327	0.990	mg/kg	1					
O-Phosphate as P	B	1.46	0.663	1.98	mg/kg	1					
Sulfate		7.38	1.32	3.96	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		2.44	0.162	0.475	mg/kg	1	KLP1	09/09/13	1623	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR8	Project: WCHN00213
Sample ID: 332930009	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:30	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .539%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.5C	X	8.79	0.010	0.100	pH	1	LXA1	09/10/13	1430	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.674	0.674	2.01	mg/kg	1	DM	09/12/13	0538	1329700	2
Chloride		5.14	0.674	2.01	mg/kg	1					
Fluoride		1.24	0.332	1.01	mg/kg	1					
Nitrate-N	B	0.751	0.332	1.01	mg/kg	1					
Nitrite-N	U	0.332	0.332	1.01	mg/kg	1					
O-Phosphate as P	U	0.674	0.674	2.01	mg/kg	1					
Sulfate		10.9	1.34	4.02	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	B	0.330	0.171	0.504	mg/kg	1	KLP1	09/09/13	1624	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWR9	Project: WCHN00213
Sample ID: 332930010	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:35	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .391%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.4C	X	9.08	0.010	0.100	pH	1	LXA1	09/10/13	1439	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.661	0.661	1.97	mg/kg	1	DM	09/12/13	0610	1329700	2
Chloride		3.36	0.661	1.97	mg/kg	1					
Fluoride	B	0.686	0.326	0.987	mg/kg	1					
Nitrate-N	B	0.453	0.326	0.987	mg/kg	1					
Nitrite-N	U	0.326	0.326	0.987	mg/kg	1					
O-Phosphate as P	B	0.681	0.661	1.97	mg/kg	1					
Sulfate	B	2.75	1.31	3.95	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	U	0.156	0.156	0.459	mg/kg	1	KLP1	09/09/13	1625	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT0	Project: WCHN00213
Sample ID: 332930011	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:41	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .287%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.3C	X	8.82	0.010	0.100	pH	1	LXA1	09/10/13	1446	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.672	0.672	2.01	mg/kg	1	DM	09/12/13	0641	1329700	2
Chloride	B	0.922	0.672	2.01	mg/kg	1					
Fluoride	B	0.859	0.331	1.00	mg/kg	1					
Nitrate-N	B	0.565	0.331	1.00	mg/kg	1					
Nitrite-N	U	0.331	0.331	1.00	mg/kg	1					
O-Phosphate as P	B	1.06	0.672	2.01	mg/kg	1					
Sulfate	B	1.98	1.33	4.01	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	U	0.166	0.166	0.489	mg/kg	1	KLP1	09/09/13	1626	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT1	Project: WCHN00213
Sample ID: 332930012	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 08:53	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .546%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.4C	X	8.63	0.010	0.100	pH	1	LXA1	09/10/13	1447	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.674	0.674	2.01	mg/kg	1	DM	09/12/13	0712	1329700	2
Chloride	B	0.970	0.674	2.01	mg/kg	1					
Fluoride		1.35	0.332	1.01	mg/kg	1					
Nitrate-N	B	0.616	0.332	1.01	mg/kg	1					
Nitrite-N	U	0.332	0.332	1.01	mg/kg	1					
O-Phosphate as P	B	1.16	0.674	2.01	mg/kg	1					
Sulfate		5.13	1.34	4.02	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	U	0.168	0.168	0.493	mg/kg	1	KLP1	09/09/13	1632	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT2	Project: WCHN00213
Sample ID: 332930013	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 09:25	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: .521%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.3C	X	6.74	0.010	0.100	pH	1	LXA1	09/10/13	1451	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.668	0.668	2.00	mg/kg	1	DM	09/12/13	0744	1329700	2
Chloride		4.03	0.668	2.00	mg/kg	1					
Fluoride		1.15	0.329	0.998	mg/kg	1					
Nitrate-N		28.1	0.329	0.998	mg/kg	1					
Nitrite-N	U	0.329	0.329	0.998	mg/kg	1					
O-Phosphate as P		5.38	0.668	2.00	mg/kg	1					
Sulfate		35.3	1.33	3.99	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite	D	28.1	0.852	2.51	mg/kg	5	KLP1	09/09/13	1638	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

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Certificate of Analysis

Report Date: September 16, 2013

Company : WC-Hanford, Inc.
 Address : 2620 Fermi Avenue
 MSIN H4-21
 Richland, Washington 99354
 Contact: Joan Kessner
 Project: RC-232 Soil

Client SDG: XP0010

Client Sample ID: J1RWT3	Project: WCHN00213
Sample ID: 332930014	Client ID: WCHN001
Matrix: SOIL	
Collect Date: 05-SEP-13 09:43	
Receive Date: 06-SEP-13	
Collector: Client	
Moisture: 3.06%	

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Electrode Analysis											
SW9045D pH "As Received"											
pH at Temp 21.6C	X	8.54	0.010	0.100	pH	1	LXA1	09/10/13	1453	1329945	1
Ion Chromatography											
SW846 9056A Anions "Dry Weight Corrected"											
Bromide	U	0.691	0.691	2.06	mg/kg	1	DM	09/12/13	0918	1329700	2
Chloride	B	1.67	0.691	2.06	mg/kg	1					
Fluoride		1.25	0.340	1.03	mg/kg	1					
Nitrate-N		3.68	0.340	1.03	mg/kg	1					
Nitrite-N	U	0.340	0.340	1.03	mg/kg	1					
O-Phosphate as P		3.93	0.691	2.06	mg/kg	1					
Sulfate		9.68	1.37	4.13	mg/kg	1					
Nutrient Analysis											
EPA 353.2 Nitrogen, Nitrate/Nitrite "Dry Weight Corrected"											
Nitrogen, Nitrate/Nitrite		3.08	0.175	0.516	mg/kg	1	KLP1	09/09/13	1634	1329609	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 353.2 Modified	EPA 353.2 Modified Nitrate/Nitrite	KLP1	09/09/13	1500	1329608
SW846 9056A	SW846 9056A Total Anions in Soil	DM	09/11/13	1600	1329699

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9045D	
2	SW846 9056A	
3	EPA 353.2 Modified	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: September 16, 2013

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

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Electrode Analysis											
Batch	1329945										
QC1202944698	332930001	DUP									
pH	X	9.36	X	9.32	pH	0.428		(0%-10%)	LXA1	09/10/13	12:28
QC1202944697	LCS										
pH	7.00			7.00	pH		100	(99%-101%)		09/10/13	12:07
Ion Chromatography											
Batch	1329467										
QC1202943470	332930007	DUP									
Bromide	U	0.673	U	0.673	mg/kg	N/A	^		MAR1	09/12/13	16:38
Chloride		2.23		2.25	mg/kg	0.763	^	(+/-2.01)			
Fluoride		1.28		1.29	mg/kg	0.469	^	(+/-1.00)			
Nitrate-N	B	0.566	B	0.558	mg/kg	1.43	^	(+/-1.00)			
Nitrite-N	U	0.332	U	0.332	mg/kg	N/A	^				
O-Phosphate as P	U	0.673	U	0.673	mg/kg	N/A	^				
Sulfate		25.0		25.1	mg/kg	0.281		(0%-20%)			
QC1202943472	LCS										
Bromide	12.5			12.5	mg/kg		99.9	(90%-110%)		09/12/13	11:09
Chloride	50.0			47.3	mg/kg		94.7	(90%-110%)			
Fluoride	25.0			24.2	mg/kg		96.9	(90%-110%)			
Nitrate-N	25.0			24.2	mg/kg		96.8	(90%-110%)			
Nitrite-N	25.0			24.5	mg/kg		98.2	(90%-110%)			
O-Phosphate as P	12.5			12.0	mg/kg		96.4	(90%-110%)			
Sulfate	100			97.4	mg/kg		97.4	(90%-110%)			
QC1202943469	MB										
Bromide			U	0.670	mg/kg					09/12/13	10:36

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QC Summary

Workorder: 332930

Client SDG: XP0010

Project Description: RC-232 Soil

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Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1329467										
Chloride			U	0.670	mg/kg				MAR1	09/12/13	10:36
Fluoride			U	0.330	mg/kg						
Nitrate-N			U	0.330	mg/kg						
Nitrite-N			U	0.330	mg/kg						
O-Phosphate as P			U	0.670	mg/kg						
Sulfate			U	1.33	mg/kg						
QC1202943471 332930007 MS											
Bromide	12.6	U	0.673	12.9	mg/kg		103	(70%-134%)		09/12/13	17:11
Chloride	50.2		2.23	49.9	mg/kg		94.9	(46%-150%)			
Fluoride	25.1		1.28	25.1	mg/kg		94.9	(34%-134%)			
Nitrate-N	25.1	B	0.566	25.0	mg/kg		97.3	(68%-129%)			
Nitrite-N	25.1	U	0.332	25.0	mg/kg		98.4	(68%-130%)			
O-Phosphate as P	12.6	U	0.673	11.1	mg/kg		86.4	(26%-124%)			
Sulfate	100		25.0	120	mg/kg		94.2	(50%-151%)			
Batch 1329700											
QC1202944078 332930008 DUP											
Bromide		U	0.663	U	0.663	mg/kg	N/A	^	DM	09/12/13	04:35
Chloride			2.95	3.00	mg/kg	1.57	^	(+/-1.98)			
Fluoride			1.00	B	0.977	mg/kg	2.80	^			(+/-0.990)
Nitrate-N			3.15	3.11	mg/kg	1.04	^	(+/-0.990)			
Nitrite-N		U	0.327	U	0.327	mg/kg	N/A	^			
O-Phosphate as P		B	1.46	B	1.42	mg/kg	2.55	^			(+/-1.98)
Sulfate			7.38	7.39	mg/kg	0.0804	^	(+/-3.96)			

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QC Summary

Workorder: 332930

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Project Description: RC-232 Soil

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1329700										
QC1202944080	LCS										
Bromide	12.5			13.2	mg/kg		105	(90%-110%)	DM	09/12/13	03:33
Chloride	50.0			51.2	mg/kg		102	(90%-110%)			
Fluoride	25.0			26.5	mg/kg		106	(90%-110%)			
Nitrate-N	25.0			26.1	mg/kg		104	(90%-110%)			
Nitrite-N	25.0			26.2	mg/kg		105	(90%-110%)			
O-Phosphate as P	12.5			13.7	mg/kg		109	(90%-110%)			
Sulfate	100			106	mg/kg		106	(90%-110%)			
QC1202944077	MB										
Bromide			U	0.670	mg/kg					09/12/13	03:01
Chloride			U	0.670	mg/kg						
Fluoride			U	0.330	mg/kg						
Nitrate-N			U	0.330	mg/kg						
Nitrite-N			U	0.330	mg/kg						
O-Phosphate as P			U	0.670	mg/kg						
Sulfate			U	1.33	mg/kg						
QC1202944079	332930008 MS										
Bromide	12.6	U	0.663	13.9	mg/kg		111	(70%-134%)		09/12/13	05:07
Chloride	50.2		2.95	54.3	mg/kg		102	(46%-150%)			
Fluoride	25.1		1.00	24.1	mg/kg		92	(34%-134%)			
Nitrate-N	25.1		3.15	29.7	mg/kg		106	(68%-129%)			
Nitrite-N	25.1	U	0.327	26.7	mg/kg		106	(68%-130%)			
O-Phosphate as P	12.6	B	1.46	14.4	mg/kg		103	(26%-124%)			

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	1329700										
Sulfate	100	7.38		114	mg/kg		106	(50%-151%)			
Nutrient Analysis											
Batch	1329609										
QC1202943831	332930001		DUP								
Nitrogen, Nitrate/Nitrite		2.06		1.67	mg/kg	20.8 ^		(+/-0.504)	KLP1	09/09/13	16:08
QC1202943834	LCS										
Nitrogen, Nitrate/Nitrite	10.0			9.60	mg/kg		96	(90%-110%)		09/09/13	16:00
QC1202943829	MB										
Nitrogen, Nitrate/Nitrite			U	0.170	mg/kg					09/09/13	15:59
QC1202943833	332930001		MS								
Nitrogen, Nitrate/Nitrite	9.99	2.06		12.2	mg/kg		101	(75%-125%)		09/09/13	16:10

Notes:

The Qualifiers in this report are defined as follows:

- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B 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).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- 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

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ 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

Moisture LogBook

Batch: 1329220

Analyst: CXC1

Date/Time: 09-SEP-2013

Procedure Code DRY WEIGHT

Procedure Description Dry Weight-Percent Moisture

Lab Sop: GL-OA-E-020

Sample St	Sample Id	Rpd(%)
DUP	1202942860	39.51

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
332907001	SAMPLE		BALHD2000D	12:31	7.078	34.662	34.572	27.584	27.494	.326
332930001	SAMPLE		BALHD2000D	12:31	7.13	29.12	29.042	21.99	21.912	.355
332930002	SAMPLE		BALHD2000D	12:31	7.241	30.145	29.972	22.904	22.731	.755
332930003	SAMPLE		BALHD2000D	12:31	7.272	37.098	36.959	29.826	29.687	.466
332930004	SAMPLE		BALHD2000D	12:31	7.218	32.028	31.298	24.81	24.08	2.94
332930005	SAMPLE		BALHD2000D	12:31	7.278	43.58	43.389	36.302	36.111	.526
332930006	SAMPLE		BALHD2000D	12:31	7.283	39.004	38.798	31.721	31.515	.649
332930007	SAMPLE		BALHD2000D	12:31	7.238	33.554	33.428	26.316	26.19	.479
332930008	SAMPLE		BALHD2000D	12:31	7.165	37.693	37.403	30.528	30.238	.95
332930009	SAMPLE		BALHD2000D	12:31	7.207	37.986	37.82	30.779	30.613	.539
332930010	SAMPLE		BALHD2000D	12:31	7.154	38.353	38.231	31.199	31.077	.391
332930011	SAMPLE		BALHD2000D	12:31	7.332	34.146	34.069	26.814	26.737	.287
332930012	SAMPLE		BALHD2000D	12:31	7.258	38.373	38.203	31.115	30.945	.546
332930013	SAMPLE		BALHD2000D	12:31	7.278	30.499	30.378	23.221	23.1	.521
332930014	SAMPLE		BALHD2000D	12:31	7.212	34.321	33.492	27.109	26.28	3.06
332930015	SAMPLE		BALHD2000D	12:31	7.195	32.932	32.833	25.737	25.638	.385
332930016	SAMPLE		BALHD2000D	12:31	7.333	30.041	30.041	22.708	22.708	0
1202942860	DUP	332930001	BALHD2000D	12:31	7.245	26.178	26.133	18.933	18.888	.238

Comments:

A) Result = (Net Initial - Net Final) / Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS