# SAF-RC-138
# 300 Area Sanitary Sewer Sampling – Biannual Constituents
# FINAL DATA PACKAGE

**COMPLETE COPY OF DATA PACKAGE TO:**

No Distribution Required

**COMMENTS:**

**SDG K4069 SAF-RC-138**

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

**Sample Location/Waste Site: 300 Area Sanitary Sewer – Semi Annual**

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

12 March 2013

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

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1302035 |
| SDG # | K4069 |
| SAF # | RC-138 |
| Date Received | 02/14/13 |
| # Samples | 1 |
| Matrix | WATER |
| Volatiles | |
| Semivolatiles | |
| Pest/PCB | X |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | |
| Metals | X |
| Inorganics | X |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 39 pages.

# CHAIN OF CUSTODY

Lionville Laboratory Use Only: 1302035

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford GAF# RC-138
Est. Final Proj. Sampling Date:
Project#:
Project Contact/Phone#:
Lionville Laboratory Project Manager: O. Johnson
QC: SW Del: SH TAT: 21

Date Rec'd: 2-14-13 Date Due: 3-7-13

| | | AB | | | C | | D | E | F | G | H | I | J | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrigerator # | | | 2 | | | 2 | | 2 | 2 | 2 | 2 | 2 | | | | |
| #/Type Container | Liquid | | 2AG | | | 1AG | | 1 | 2 | 2 | 1P | 1P | | | | |
| | Solid | | | | | | | | | | | | | | | |
| Volume | Liquid | | 1000 | | | 1000 | | L | 1000 | 500 | 500 | L | | | | |
| | Solid | | | | | | | | | | | | | | | |
| Preservatives | | | — | | | $H_2SO_4$ | | $HNO_3$ | NaOH | $HNO_3$ | — | — | | | | |
| ANALYSES REQUESTED → | | ORGANIC: VOA | BNA | Pest/PCB | Herb | | TOT Phenols | | INORG: Metal | CN | Hg | TSS | BOD | | | |

| MATRIX CODES: | Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only: Pesticides 608 | Phenols 420.4 | Metals 200.7 | Cyanide 4500 | Mercury 245.1 | TSS | BOD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W Water, WW Waste Water, GW Groundwater, WST Waste, WI Wipe, SO Solid, S Soil, SL Sludge, SE Sediment, PC Paint Chips, O Oil, NAL Non-Aqueous Liquid, L Leachate, A Air, T Tissue, F Fish | 01 | J1RDC8 | ✓ | ✓ | W | 2-13-13 | 0812 | X* | X | X | X | X | X | X |
| | | | | | | | | | P 2-14-13 | PH <2 | PH >12 | PH <2 | | |

**Special Instructions:**
METALS = Sb, As, Be, Cd, Cr, Cu, Pb, Mo, Ni, Se, Ag, Tl, Zn + Hg

**Special Instructions:**
* 1. Contact Joan Kessner w/any questions.
2.
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [illegible] | [illegible] | 2/14/13 | 0908 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

2-13-13 CMB

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-138-036 | Page 1 of ~~1~~ 2 |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **Collector** Carl Phillips | **Company Contact** Tom Edmundson | **Telephone No.** 509.947.5192 | **Project Coordinator** KESSNER, JH |
| **Price Code** 7L | **Data Turnaround** 21 Days | | |
| **Project Designation** 300 Area Sanitary Sewer Sampling - Biannual Constituents | **Sampling Location** 300 Area Sanitary Sewer Semi-Annual | | **SAF No.** RC-138 |
| **Ice Chest No.** RCC-07-002 | **Field Logbook No.** EL 1518-26 | **COA** RD4MXX2F00 | **Method of Shipment** FedEx |
| **Shipped To** Lionville Laboratory Incorporated | **Offsite Property No.** A120736 | | **Bill of Lading/Air Bill No.** SEE OSPC |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*pH < 2*

**Special Handling and/or Storage**

*Temp < 4 degrees C*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Preservation** | HNO3 to pH <2 | HNO3 to pH <2 | NaOH to pH >= 12 | HCl to pH <2 Cool 4C | Cool 4C | H2SO4 to pH <2 Cool 4C | Cool 4C | Cool 4C | Cool 4C | | |
| **Type of Container** | P/G | P/G | P/G | Gs* | aG | aG | aG | P/G | P/G | | |
| **No. of Container(s)** | 1 | 2 | 2 | 12 | 4 | 1 | 2 | 1 | 1 | | |
| **Volume** | 1L | 500mL | 1000mL | 40mL | 500mL | 1000mL | 1000mL | 500mL | 1L | | |
| **SAMPLE ANALYSIS** | See item (1) in Special Instructions. | Mercury - 245.1 (CV) {Mercury} | Cyanide (Total) - SM4500 {Cyanide} | See item (2) in Special Instructions. | See item (3) in Special Instructions. | Phenolics Total Recoverable - 420.4 {Total Phenolics} | See item (4) in Special Instructions. * | TSS - 2540D {Total suspended solids} | Biochemical Oxygen Demand (BOD) - 5210 {Biochemical Oxygen Demand} | | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1RDC8 | WATER | 2/13/13 | 0812 | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Carl Phillips Carl Phillips | 2-13-13 0812 | David Encke David Encke | 2-13-13 0812 |
| David Encke David Encke | 2/13/13 0936 | A. Freier A. Freier | 0936 2-13-13 |
| A. Freier A. Freier | 2-13-13 1140 | Fed Ex | |
| Fed Ex | 2-14-13 0909 | VICTOR HERNANDEZ | 2-14-13 0908 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) Metals & Trace Elements by ICP - 200.7 {Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Zinc}
(2) Purgeables - 624 {1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, 1,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acrolein, Acrylonitrile, Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Methylenechloride, Tetrachloroethene, Toluene, trans-1,2-Dichloroethylene, trans-1,3-Dichloropropene, Trichloroethene, Vinyl chloride}
(3) Base/Neutrals and Acids - 625 {1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,2-Diphenylhydrazine, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Nitrophenol, 3,3'-Dichlorobenzidine, 4,6-Dinitro-2-methylphenol, 4-Bromophenylphenyl ether, 4-Chloro-3-methylphenol, 4-Chlorophenylphenyl ether, 4-Nitrophenol, Acenaphthene, Acenaphthylene, Anthracene, Benzidine, Benzo(a)anthracene, Benzo(a)pyrene,

* Contact Joan Kessner with any questions. 2-13-13 CMB

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| | | | |
|---|---|---|---|
| **LABORATORY SECTION** | Received By | Title | Date/Time |
| **FINAL SAMPLE DISPOSITION** | Disposal Method | Disposed By | Date/Time |

REVIEWED BY CMB DATE 2-13-13

WCH-EE-011

00000004

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | | | RC-138-036 | Page 2 of 2 |
|---|---|---|---|---|---|
| Collector: Carl Phillips | Company Contact: Tom Edmundson | Telephone No.: 509.947.5192 | Project Coordinator: KESSNER, JH | Price Code: 7L | Data Turnaround: 21 Days |
| Project Designation: 300 Area Sanitary Sewer Sampling - Biannual Constituents | Sampling Location: 300 Area Sanitary Sewer Semi-Annual | | SAF No.: RC-138 | | |
| Ice Chest No.: RCC-07-002 | Field Logbook No.: EL 1518-26 | COA: RD4MXX2F00 | Method of Shipment: FedEx | | |
| Shipped To: Lionville Laboratory Incorporated | Offsite Property No.: A120736 | | Bill of Lading/Air Bill No.: SEE OSPC | | |

**POSSIBLE SAMPLE HAZARDS/REMARKS**

*pH < 2*

**Special Handling and/or Storage**

*Temp < 4 degrees C*

| Preservation | HNO3 to pH <2 | HNO3 to pH <2 | NaOH to pH >= 12 | HCl to pH <2 Cool 4C | Cool 4C | H2SO4 to pH <2 Cool 4C | Cool 4C | Cool 4C | Cool 4C | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P/G | P/G | P/G | Gs* | aG | aG | aG | P/G | P/G | |
| No. of Container(s) | 1 | 2 | 2 | 12 | 4 | 1 | 2 | 1 | 1 | |
| Volume | 1L | 500mL | 1000mL | 40mL | 500mL | 1000mL | 1000mL | 500mL | 1L | |
| SAMPLE ANALYSIS | See item (1) in Special Instructions. | Mercury - 245.1 (CV) (Mercury) | Cyanide (Total) - SM4500 (Cyanide) | See item (2) in Special Instructions. | See item (3) in Special Instructions. | Phenolics Total Recoverable - 420.4 (Total Phenolics) | See item (4) in Special Instructions. * | TSS - 2540D (Total suspended solids) | Biochemical Oxygen Demand (BOD) - 5210 (Biochemical Oxygen Demand) | |

| Sample No. | Matrix * | Sample Date | Sample Time | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1RDC8 | WATER | 2/13/13 | 0812 | | | | | | | | ✓ | ✓ | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**CHAIN OF POSSESSION** — **Sign/Print Names**

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Carl Phillips Carl Phillips | 2-13-13 0812 | David Encke David Encke | 2-13-13 0812 |
| David Encke David Encke | 2/13/13 0936 | A. Freier A. Freier | 2-13-13 0936 |
| WCH A. Freier A. Freier | 2-13-13 1140 | Fed Ex | |
| FedEx | 2-14-13 0908 | Victor Hernandez | 2-14-13 0908 |
| | | | |
| | | | |

**SPECIAL INSTRUCTIONS**

(1) Metals & Trace Elements by ICP - 200.7 (Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Zinc)
(2) Purgeables - 624 (1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, 1,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acrolein, Acrylonitrile, Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Methylenechloride, Tetrachloroethene, Toluene, trans-1,2-Dichloroethylene, trans-1,3-Dichloropropene, Trichloroethene, Vinyl chloride)
(3) Base/Neutrals and Acids - 625 (1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,2-Diphenylhydrazine, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Nitrophenol, 3,3'-Dichlorobenzidine, 4,6-Dinitro-2-methylphenol, 4-Bromophenylphenyl ether, 4-Chloro-3-methylphenol, 4-Chlorophenylphenyl ether, 4-Nitrophenol, Acenaphthene, Acenaphthylene, Anthracene, Benzidine, Benzo(a)anthracene, Benzo(a)pyrene,

* Contact Joan Kessner with any questions. 2-13-13 CMB

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wl=Wipe
L=Liquid
V=Vegetation
X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

REVIEWED BY CMB DATE 2-13-13

WCH-EE-011

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

**CLIENT:** WC Hanford RC-138 **Date:** 2-14-13

Project/SAF/SOW/Release #:

**LvL Batch #:** 1302-035 **Sample Custodian:** [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| **1.** Samples Hand Delivered or Shipped? | Carrier FedEx | | Airbill # 7947 4627 0933 |
| **2.** Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| **3.** Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| **4.** All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| **5.** Samples received cooled or ambient? | Temp 3.4 | °C | Cooler # RCC-07-002 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| **6.** Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| **7.** COC (Client & LvL) signed & dated? | ☑ Yes | ☐ No | |
| **8.** Sample containers are intact? | ☑ Yes | ☐ No | |
| **9.** All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| **10.** All sample label information matches COC? | ☑ Yes | ☐ No | |
| **11.** Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | cN = pH>12 Hg = pH<2 met = pH<2 |
| **12.** Samples received within hold times? | ☑ Yes | ☐ No BOD | |
| Short holds taken to wet lab? | ☑ Yes | ☐ No | ☐ N/A |
| **13.** VOA, TOC, TOX, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) free of headspace? | ☐ Yes | ☐ No | ☑ N/A |
| **14.** QC stickers placed on bottles designated by client? | ☑ Yes | ☐ No | ☐ N/A |
| **15.** Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| **16.** Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted_____ Date _____

# PESTICIDES

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:07 |

## Analytical Report for Organochlorine Pesticides by EPA 608

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8 | 1302035-01 | Water | 02/13/2013 08:12 | 02/14/2013 09:08 |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-138 K4069
**LVL #:** 1302035

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 02-14-2013

## CHLORINATED PESTICIDES

One (1) water sample was collected on 02-13-2013.

The sample and associated QC samples were extracted 02-18-2013 and analyzed 02-18,19-2013 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on EPA Method 608, and the analysis procedure was based on EPA Method 608 for client specified target compounds. The sample received Copper-Sulfur cleanup based on SW846 method 3660A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All surrogate recoveries were within QC acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within QC acceptance criteria.
6. All matrix spike recoveries were within QC acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

3/12/13
Date

r:\group\data\2013\pest\wc hanford\1302035rgc.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

LIONVILLE LABORATORY INC.

# GLOSSARY OF DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U). |
| J | = | Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| I | = | Interference. |
| .I | = | Indicates an interference on one analytical column only. Result is reported from remaining analytical column. |
| P | = | This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P". |
| D | = | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| C | = | This flag applies to a compound that has been confirmed by GC/MS. |

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Indicates that recoveries were not obtained because the extract had to be diluted for analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| NS | = | Not Spiked. |
| SP | = | Indicates Spiked Compound. |
| NPM | = | No pattern match for multi-component target analytes. |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:07 |

## J1RDC8
### 1302035-01 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Organochlorine Pesticides by EPA 608** | | | | | | | | | |
| alpha-BHC | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| gamma-BHC | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| delta-BHC | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Heptachlor | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Aldrin | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Heptachlor epoxide | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Endosulfan I | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| 4,4'-DDE | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Dieldrin | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Endrin | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| 4,4'-DDD | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Endosulfan II | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| 4,4'-DDT | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Endrin aldehyde | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Endosulfan sulfate | 0.0500 | U | 0.0500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Toxaphene | 0.500 | U | 0.500 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| Chlordane | 0.100 | U | 0.100 | ug/L | 1 | L302128 | 02/18/2013 | 02/19/2013 | EPA 608 |
| *Surrogate: Tetrachloro-meta-xylene* | *76.7 %* | | *40-134* | | | *L302128* | *02/18/2013* | *02/19/2013* | *EPA 608* |
| *Surrogate: Decachlorobiphenyl* | *71.6 %* | | *21-129* | | | *L302128* | *02/18/2013* | *02/19/2013* | *EPA 608* |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:07 |

# Organochlorine Pesticides by EPA 608 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302128 - EPA 608** | | | | | | | | | | |
| **Blank (L302128-BLK1)** | | | | Prepared & Analyzed: 02/18/2013 | | | | | | |
| alpha-BHC | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| gamma-BHC | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| delta-BHC | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Heptachlor | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Aldrin | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Heptachlor epoxide | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Endosulfan I | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| 4,4'-DDE | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Dieldrin | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Endrin | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| 4,4'-DDD | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Endosulfan II | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| 4,4'-DDT | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Endrin aldehyde | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Endosulfan sulfate | 0.0500 | U | 0.0500 | ug/L | | | | | | |
| Toxaphene | 0.500 | U | 0.500 | ug/L | | | | | | |
| Chlordane | 0.100 | U | 0.100 | ug/L | | | | | | |
| *Surrogate: Tetrachloro-meta-xylene* | *0.822* | | | *ug/L* | *1.0001* | | *82.2* | *40-134* | | |
| *Surrogate: Decachlorobiphenyl* | *0.902* | | | *ug/L* | *1.0000* | | *90.2* | *21-129* | | |
| **LCS (L302128-BS1)** | | | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| alpha-BHC | 0.983 | | 0.0500 | ug/L | 1.0000 | | 98.3 | 37-134 | | |
| gamma-BHC | 0.992 | | 0.0500 | ug/L | 1.0000 | | 99.2 | 32-127 | | |
| delta-BHC | 0.901 | | 0.0500 | ug/L | 1.0000 | | 90.1 | 19-140 | | |
| Heptachlor | 0.914 | | 0.0500 | ug/L | 1.0000 | | 91.4 | 34-111 | | |
| Aldrin | 0.830 | | 0.0500 | ug/L | 1.0000 | | 83.0 | 42-122 | | |
| Heptachlor epoxide | 1.00 | | 0.0500 | ug/L | 1.0000 | | 100 | 37-142 | | |
| Endosulfan I | 1.00 | | 0.0500 | ug/L | 1.0000 | | 100 | 45-153 | | |
| 4,4'-DDE | 0.927 | | 0.0500 | ug/L | 1.0000 | | 92.7 | 30-145 | | |
| Dieldrin | 1.01 | | 0.0500 | ug/L | 1.0000 | | 101 | 36-146 | | |
| Endrin | 1.02 | | 0.0500 | ug/L | 1.0000 | | 102 | 30-147 | | |
| 4,4'-DDD | 0.878 | | 0.0500 | ug/L | 1.0000 | | 87.8 | 31-141 | | |
| Endosulfan II | 1.02 | | 0.0500 | ug/L | 1.0000 | | 102 | 0-202 | | |
| 4,4'-DDT | 0.940 | | 0.0500 | ug/L | 1.0000 | | 94.0 | 25-160 | | |
| Endrin aldehyde | 1.01 | | 0.0500 | ug/L | 1.0000 | | 101 | 74-131 | | |
| Endosulfan sulfate | 0.991 | | 0.0500 | ug/L | 1.0000 | | 99.1 | 26-144 | | |
| Toxaphene | 0.500 | U | 0.500 | ug/L | | | | 41-126 | | |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:07 |

## Organochlorine Pesticides by EPA 608 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302128 - EPA 608** | | | | | | | | | | |
| **LCS (L302128-BS1)** | | | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| Chlordane | 0.100 | U | 0.100 | ug/L | | | | 45-119 | | |
| *Surrogate: Tetrachloro-meta-xylene* | *0.876* | | | *ug/L* | *1.0001* | | *87.6* | *40-134* | | |
| *Surrogate: Decachlorobiphenyl* | *0.952* | | | *ug/L* | *1.0000* | | *95.2* | *21-129* | | |
| **Matrix Spike (L302128-MS1)** | | **Source: 1302035-01** | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| alpha-BHC | 0.880 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 88.0 | 37-134 | | |
| gamma-BHC | 0.894 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 89.4 | 32-127 | | |
| delta-BHC | 0.826 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 82.6 | 19-140 | | |
| Heptachlor | 0.895 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 89.5 | 34-111 | | |
| Aldrin | 0.809 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 80.9 | 42-122 | | |
| Heptachlor epoxide | 0.930 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 93.0 | 37-142 | | |
| Endosulfan I | 0.886 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 88.6 | 45-153 | | |
| 4,4'-DDE | 0.840 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 84.0 | 30-145 | | |
| Dieldrin | 0.900 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 90.0 | 36-146 | | |
| Endrin | 0.950 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 95.0 | 30-147 | | |
| 4,4'-DDD | 0.893 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 89.3 | 31-141 | | |
| Endosulfan II | 0.923 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 92.3 | 0-202 | | |
| 4,4'-DDT | 0.840 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 84.0 | 25-160 | | |
| Endrin aldehyde | 0.911 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 91.1 | 74-131 | | |
| Endosulfan sulfate | 0.877 | | 0.0500 | ug/L | 1.0000 | 0.0500 U | 87.7 | 26-144 | | |
| Toxaphene | 0.500 | U | 0.500 | ug/L | | 0.500 U | | 41-126 | | |
| Chlordane | 0.100 | U | 0.100 | ug/L | | 0.100 U | | 45-119 | | |
| *Surrogate: Tetrachloro-meta-xylene* | *0.881* | | | *ug/L* | *1.0001* | | *88.1* | *40-134* | | |
| *Surrogate: Decachlorobiphenyl* | *0.817* | | | *ug/L* | *1.0000* | | *81.7* | *21-129* | | |

# PREPARATION BENCH SHEET

L302128

**Lionville Laboratory**

**Printed: 2/18/2013 2:22:05PM**

00000014

**Matrix: Water** **Prepared using: Extraction - EPA 608** **Surrogate used: 1201397**

| Lab Number | Analysis | Prepared | Initial (mL) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1302035-01 | 608 Chlorinated Pesticides | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1302035-01 | 608 PCBs | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L302128-BLK1 | QC | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | | PEST |
| L302128-BLK2 | QC | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | | PCB |
| L302128-BS1 | QC | 02/18/2013 11:08 | 1000 | 10 | 1201358 | | 250 | 250 | | PEST |
| L302128-BS2 | QC | 02/18/2013 11:08 | 1000 | 10 | 1300037 | | 250 | 250 | | PCB |
| L302128-BSD2 | QC | 02/18/2013 11:08 | 1000 | 10 | 1300037 | | 250 | 250 | | PCB |
| L302128-MS1 | QC | 02/18/2013 11:08 | 1000 | 10 | 1201358 | 1302035-01 | 250 | 250 | | PEST |

S cleaved 02.18.13 SZ
Cu lot # B10X036

Extracts Relinquished By — Date 2/18/13 1425

Extracts Received By — Date 02.18.13 14:30

# PCBs

264 Welsh Pool Road
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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:06 |

## Analytical Report for PCBs by EPA 608

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8 | 1302035-01 | Water | 02/13/2013 08:12 | 02/14/2013 09:08 |

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A division of Eberline Analytical Corporation

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Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-138 K4069
**LVL #:** 1302035

**W.O. #:** 60049-001-001-0001-00
**Received:** 02-14-2013

## PCBs

One (1) water sample was collected on 02-13-2013.

The sample and associated QC samples were extracted 02-18-2013 and analyzed 02-18-2013 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on EPA Method 608 and the analysis procedure was based on EPA Method 608. The sample and associated QC received Copper-Sulfur and Sulfuric Acid cleanups based on SW846 methods 3660A and 3665A.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from a sample that met LvL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. All surrogate recoveries were within QC acceptance criteria.
4. The method blank was below the reporting limits for all target compounds.
5. All blank spike recoveries were within QC acceptance criteria.
6. All initial calibrations associated with this data set were within acceptance criteria.
7. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria with the exception of Decachlorobiphenyl, which was 23% low.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the laboratory manager or a designee as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

3/12/13
Date

r:\group\data\2013\pcb\wc hanford\1302035rgc.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

# GLOSSARY OF DATA

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U). |
| J | = | Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| I | = | Interference. |
| .I | = | Indicates an interference on one analytical column only. Result is reported from remaining analytical column. |
| P | = | This flag is used for a dual column analysis (i.e. pesticides/PCB/herbicides) when there is greater than 40% difference for detected concentrations between the two GC columns; the lower of the two values is reported on Form 1 and flagged with a "P". |
| D | = | This flag identifies all compounds identified in an analysis at a secondary dilution factor. |
| C | = | This flag applies to a compound that has been confirmed by GC/MS. |

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Indicates that recoveries were not obtained because the extract had to be diluted for analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| NS | = | Not Spiked. |
| SP | = | Indicates Spiked Compound. |
| NPM | = | No pattern match for multi-component target analytes. |

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Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:06 |

## J1RDC8
### 1302035-01 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **PCBs by EPA 608** | | | | | | | | | |
| Aroclor 1016 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1221 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1232 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1242 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1248 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1254 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1260 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1262 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| Aroclor 1268 | 0.400 | U | 0.400 | ug/L | 1 | L302128 | 02/18/2013 | 02/18/2013 | EPA 608 |
| *Surrogate: Tetrachloro-meta-xylene* | *82 %* | | *45-117* | | | *L302128* | *02/18/2013* | *02/18/2013* | *EPA 608* |
| *Surrogate: Decachlorobiphenyl* | *70 %* | | *22-131* | | | *L302128* | *02/18/2013* | *02/18/2013* | *EPA 608* |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:06 |

# PCBs by EPA 608 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302128 - EPA 608** | | | | | | | | | | |
| **Blank (L302128-BLK2)** | | | | Prepared & Analyzed: 02/18/2013 | | | | | | |
| Aroclor 1016 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1221 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1232 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1242 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1248 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1254 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1260 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1262 | 0.400 | U | 0.400 | ug/L | | | | | | |
| Aroclor 1268 | 0.400 | U | 0.400 | ug/L | | | | | | |
| *Surrogate: Tetrachloro-meta-xylene* | *0.891* | | | *ug/L* | *1.0001* | | *89* | *45-117* | | |
| *Surrogate: Decachlorobiphenyl* | *0.803* | | | *ug/L* | *1.0000* | | *80* | *22-131* | | |
| **LCS (L302128-BS2)** | | | | Prepared & Analyzed: 02/18/2013 | | | | | | |
| Aroclor 1016 | 4.15 | | 0.400 | ug/L | 5.0000 | | 83 | 50-114 | | |
| Aroclor 1260 | 4.63 | | 0.400 | ug/L | 5.0000 | | 93 | 8-127 | | |
| *Surrogate: Tetrachloro-meta-xylene* | *0.866* | | | *ug/L* | *1.0001* | | *87* | *45-117* | | |
| *Surrogate: Decachlorobiphenyl* | *0.697* | | | *ug/L* | *1.0000* | | *70* | *22-131* | | |
| **LCS Dup (L302128-BSD2)** | | | | Prepared & Analyzed: 02/18/2013 | | | | | | |
| Aroclor 1016 | 4.40 | | 0.400 | ug/L | 5.0000 | | 88 | 50-114 | 6 | 20 |
| Aroclor 1260 | 5.02 | | 0.400 | ug/L | 5.0000 | | 100 | 8-127 | 8 | 20 |
| *Surrogate: Tetrachloro-meta-xylene* | *0.915* | | | *ug/L* | *1.0001* | | *91* | *45-117* | | |
| *Surrogate: Decachlorobiphenyl* | *0.880* | | | *ug/L* | *1.0000* | | *88* | *22-131* | | |

# PREPARATION BENCH SHEET

L302128

**Lionville Laboratory**

**Printed: 2/18/2013 2:22:05PM**

**Matrix: Water**

**Prepared using: Extraction - EPA 608**

**Surrogate used: 1201397**

| Lab Number | Analysis | Prepared | Initial (mL) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1302035-01 | 608 Chlorinated Pesticides | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | WC-Hanford, Inc. | |
| 1302035-01 | 608 PCBs | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | WC-Hanford, Inc. | |
| L302128-BLK1 | QC | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | | PEST |
| L302128-BLK2 | QC | 02/18/2013 11:08 | 1000 | 10 | | | | 250 | | PCB |
| L302128-BS1 | QC | 02/18/2013 11:08 | 1000 | 10 | 1201358 | | 250 | 250 | | PEST |
| L302128-BS2 | QC | 02/18/2013 11:08 | 1000 | 10 | 1300037 | | 250 | 250 | | PCB |
| L302128-BSD2 | QC | 02/18/2013 11:08 | 1000 | 10 | 1300037 | | 250 | 250 | | PCB |
| L302128-MS1 | QC | 02/18/2013 11:08 | 1000 | 10 | 1201358 | 1302035-01 | 250 | 250 | | PEST |

S cleaned 02.18.13 SL
Cu lot # B10X036

Extracts Relinquished By 2/18/13 1425 Date

S Lak 02.18.13 14:30
Extracts Received By Date

# METALS

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## Analytical Report for Metals by EPA 200 series

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8 | 1302035-01 | Water | 02/13/2013 08:12 | 02/14/2013 09:08 |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
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# Case Narrative

**Client:** WC-HANFORD RC-138
**LVL#:** 1302035
**SDG/SAF#:** K4069/RC-138

**W.O.#:** 60049-001-001-0001-00
**Date Received:** 02-14-13

## METALS

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) certifies that all test results meet the requirements of NELAC except as noted below.

1. This narrative covers the analysis of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods listed on the data report forms.

3. All analyses were performed within the required holding times.

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.

5. All Initial Calibration Verifications (ICVs) were within the 95-115% control limits, and all Continuing Calibration Verifications (CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).

7. All preparation/method blanks were within method criteria. {less than the Limit of Quantitation, samples greater than 20X MB value}.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 85-115% control limits.

10. All matrix spike (MS) recoveries were within the 70-130% control limits.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limit criteria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample result for Arsenic was less than ten times the MDL.


The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

12. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

13. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

3/12/13
Date

m1302035wa/jjw

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Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| J | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag). |
| B | Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag) |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## J1RDC8
### 1302035-01 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Metals by EPA 200 series** | | | | | | | | | |
| Antimony | 5.00 | U | 5.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Arsenic** | **2.36** | B | 5.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Beryllium** | **0.117** | B | 0.500 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Cadmium** | **0.142** | B | 0.500 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Chromium** | **3.46** | | 2.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Copper** | **532** | | 5.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Lead** | **1.10** | B | 5.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Molybdenum** | **3.62** | | 2.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Nickel** | **3.26** | | 2.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| Selenium | 10.0 | U | 10.0 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| Silver | 2.00 | U | 2.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| Thallium | 5.00 | U | 5.00 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| **Zinc** | **135** | | 20.0 | ug/L | 1 | L302132 | 02/18/2013 | 02/20/2013 | EPA200.7 |
| Mercury | 0.200 | U | 0.200 | ug/L | 1 | L302134 | 02/18/2013 | 02/19/2013 | EPA 245.1 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## Metals by EPA 200 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302132 - EPA 200.7** | | | | | | | | | | |
| **Blank (L302132-BLK1)** | | | | Prepared: 02/18/2013 Analyzed: 02/20/2013 | | | | | | |
| Antimony | 5.00 | U | 5.00 | ug/L | | | | | | |
| Arsenic | 5.00 | U | 5.00 | ug/L | | | | | | |
| Beryllium | 0.500 | U | 0.500 | ug/L | | | | | | |
| Cadmium | 0.500 | U | 0.500 | ug/L | | | | | | |
| Chromium | 2.00 | U | 2.00 | ug/L | | | | | | |
| Copper | 5.00 | U | 5.00 | ug/L | | | | | | |
| Lead | 5.00 | U | 5.00 | ug/L | | | | | | |
| Molybdenum | 2.00 | U | 2.00 | ug/L | | | | | | |
| Nickel | 2.00 | U | 2.00 | ug/L | | | | | | |
| Selenium | 10.0 | U | 10.0 | ug/L | | | | | | |
| Silver | 2.00 | U | 2.00 | ug/L | | | | | | |
| Thallium | 5.00 | U | 5.00 | ug/L | | | | | | |
| Zinc | 20.0 | U | 20.0 | ug/L | | | | | | |
| **LCS (L302132-BS1)** | | | | Prepared: 02/18/2013 Analyzed: 02/20/2013 | | | | | | |
| Antimony | 260 | | 5.00 | ug/L | 250.00 | | 104 | 85-115 | | |
| Arsenic | 1000 | | 5.00 | ug/L | 1000.0 | | 100 | 85-115 | | |
| Beryllium | 24.0 | | 0.500 | ug/L | 25.000 | | 96 | 85-115 | | |
| Cadmium | 27.3 | | 0.500 | ug/L | 25.000 | | 109 | 85-115 | | |
| Chromium | 96.8 | | 2.00 | ug/L | 100.00 | | 97 | 85-115 | | |
| Copper | 129 | | 5.00 | ug/L | 125.00 | | 103 | 85-115 | | |
| Lead | 248 | | 5.00 | ug/L | 250.00 | | 99 | 85-115 | | |
| Molybdenum | 491 | | 2.00 | ug/L | 500.00 | | 98 | 85-115 | | |
| Nickel | 248 | | 2.00 | ug/L | 250.00 | | 99 | 85-115 | | |
| Selenium | 1020 | | 10.0 | ug/L | 1000.0 | | 102 | 85-115 | | |
| Silver | 25.6 | | 2.00 | ug/L | 25.000 | | 102 | 85-115 | | |
| Thallium | 996 | | 5.00 | ug/L | 1000.0 | | 100 | 85-115 | | |
| Zinc | 259 | | 20.0 | ug/L | 250.00 | | 104 | 85-115 | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## Metals by EPA 200 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302132 - EPA 200.7** | | | | | | | | | | |
| **Duplicate (L302132-DUP1)** | | **Source: 1302035-01** | | Prepared: 02/18/2013 Analyzed: 02/20/2013 | | | | | | |
| Antimony | 5.00 | U | 5.00 | ug/L | | 5.00 U | | | | 20 |
| Arsenic | 3.23 | B | 5.00 | ug/L | | 2.36 | | | 31* | 20 |
| Beryllium | 0.500 | U | 0.500 | ug/L | | 0.117 | | | | 20 |
| Cadmium | 0.143 | B | 0.500 | ug/L | | 0.142 | | | 0.7 | 20 |
| Chromium | 3.28 | | 2.00 | ug/L | | 3.46 | | | 5 | 20 |
| Copper | 520 | | 5.00 | ug/L | | 532 | | | 2 | 20 |
| Lead | 5.00 | U | 5.00 | ug/L | | 1.10 | | | | 20 |
| Molybdenum | 3.77 | | 2.00 | ug/L | | 3.62 | | | 4 | 20 |
| Nickel | 2.82 | | 2.00 | ug/L | | 3.26 | | | 15 | 20 |
| Selenium | 10.0 | U | 10.0 | ug/L | | 10.0 U | | | | 20 |
| Silver | 2.00 | U | 2.00 | ug/L | | 2.00 U | | | | 20 |
| Thallium | 5.00 | U | 5.00 | ug/L | | 5.00 U | | | | 20 |
| Zinc | 131 | | 20.0 | ug/L | | 135 | | | 3 | 20 |
| **Matrix Spike (L302132-MS1)** | | **Source: 1302035-01** | | Prepared: 02/18/2013 Analyzed: 02/20/2013 | | | | | | |
| Antimony | 264 | | 5.00 | ug/L | 250.00 | 5.00 U | 105 | 70-130 | | |
| Arsenic | 1040 | | 5.00 | ug/L | 1000.0 | 2.36 | 104 | 70-130 | | |
| Beryllium | 24.7 | | 0.500 | ug/L | 25.000 | 0.117 | 98 | 70-130 | | |
| Cadmium | 27.8 | | 0.500 | ug/L | 25.000 | 0.142 | 110 | 70-130 | | |
| Chromium | 100 | | 2.00 | ug/L | 100.00 | 3.46 | 97 | 70-130 | | |
| Copper | 652 | | 5.00 | ug/L | 125.00 | 532 | 96 | 70-130 | | |
| Lead | 237 | | 5.00 | ug/L | 250.00 | 1.10 | 94 | 70-130 | | |
| Molybdenum | 495 | | 2.00 | ug/L | 500.00 | 3.62 | 98 | 70-130 | | |
| Nickel | 241 | | 2.00 | ug/L | 250.00 | 3.26 | 95 | 70-130 | | |
| Selenium | 1030 | | 10.0 | ug/L | 1000.0 | 10.0 U | 103 | 70-130 | | |
| Silver | 26.5 | | 2.00 | ug/L | 25.000 | 2.00 U | 106 | 70-130 | | |
| Thallium | 908 | | 5.00 | ug/L | 1000.0 | 5.00 U | 91 | 70-130 | | |
| Zinc | 394 | | 20.0 | ug/L | 250.00 | 135 | 103 | 70-130 | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:05 |

## Metals by EPA 200 series - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302134 - EPA 245.1** | | | | | | | | | | |
| **Blank (L302134-BLK1)** | | | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| Mercury | 0.200 | U | 0.200 | ug/L | | | | | | |
| **LCS (L302134-BS1)** | | | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| Mercury | 3.83 | | 0.200 | ug/L | 4.0000 | | 96 | 85-115 | | |
| **Duplicate (L302134-DUP1)** | | **Source: 1302035-01** | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| Mercury | 0.200 | U | 0.200 | ug/L | | 0.200 U | | | | 20 |
| **Matrix Spike (L302134-MS1)** | | **Source: 1302035-01** | | Prepared: 02/18/2013 Analyzed: 02/19/2013 | | | | | | |
| Mercury | 4.06 | | 0.200 | ug/L | 4.0000 | 0.200 U | 102 | 70-130 | | |

Lionville Laboratory

Logbook #: 1194

# SAMPLE DIGESTION RECORD

Digestion Batch #: L302132
Date/Time Initiated: 2/18/13 1320
Date/Time Completed: 2/19/13 1110
Analyst: MM
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)
pH/Turbidity: N/A for Solids.
**NOTE**: All temperatures are recorded as corrected temperatures

Digested Undigested (circle one)
Balance #:
Balance Cal Verification: Y NA
Temp: 94°
BLOCK 1 2 (circle one)
3

| Work Order # | Spike Vol (mL) | Initial Wt/Vol (g/mL) | Final Vol (mL) | pH <2 | Type: To/Sol/ TC | Texture | Color / Appearance | Artifact | Turb |
|---|---|---|---|---|---|---|---|---|---|
| L302035-01 | | 100 | 50 | < | TO | | cloudy, nearly colorless | | |
| L302132-DB1 | | 50 | 25 | < | ↓ | | ↓ ↓ | | |
| MS1 | 0.250 | 50 | 25 | < | ↓ | | ↓ ↓ | | |
| L302132-BK4 | | 50 | 25 | | | | clear, colorless | | |
| BS1 | 0.250 | 50 | 25 | | | | ↓ ↓ | | |

MM 2/18/13

Spiking IDs / Expiration Date:
MS#: 1300144

LCS#: 1300144

Reagent IDs:
$HNO_3$
HCl
$H_2O_2$
1:1 $HNO_3$ 637-076-07
1:1 HCl 637-069-01

File ID#:

Data Review By/Date:
RW 2/19/13

R:\group\QA\SOP\
Signed\SPI\Metals Digestion log.doc

Page #:

Lionville Laboratory

# MERCURY PREPARATION

Analyst: [illegible]
Date 2/18/13
Start Time/Temp: 1500 / 94°
End Time/Temp: 1700 / 97°

Instrument ID: HG3.2
Balance # (N/A)
Pipette Calibration (Daily) (Y)

Logbook # 1198
Prep Batch: L302134
Worksheet: HG021902
SOP No. ME-HgCVAA
BLOCK (1) 2 (circle one)

**NOTE: All temperatures are recorded as corrected temperatures.**

| LvL Work Order# | pH < 2 (Liq) | Spike Vol (mL) | Spike Conc. (µg/L) | Initial Wt. or Vol (g or (mL)) | Final Sample Vol (mL) | Comments, % Solids, etc. |
|---|---|---|---|---|---|---|
| blank | | | | 35 | 35 | |
| 0.2 µg/L | | 0.070 | | 35 | 35 | |
| 1.0 µg/L | | 0.350 | | 35 | 35 | |
| 2.0 µg/L | | 0.700 | | 35 | 35 | |
| 5.0 µg/L | | 1.750 | | 35 | 35 | |
| 10.0 µg/L | | 3.500 | | 35 | 35 | |
| ICV | | 0.175 | 5.0 | 35 | 35 | |
| CCV | | 0.175 | 5.0 | 35 | 35 | |
| ICB/CCB | | | | 35 | 35 | |
| L302134-BLK1 | | | | 35 | 35 | |
| BS1 | | 1.400 | 4.0 | 35 | 35 | |
| 1302035-01 | < | | | 35 | 35 | |
| L302134-DUP1 | < | | | 35 | 35 | |
| MS1 | < | 1.400 | 4.0 | 35 | 35 | |

[illegible] 2/18/13

| Standard: | ID | Prep Date/Time |
|---|---|---|
| ICAL/MS/LCS | RI 1201235 | 2/18/13 0940 |
| ICV/CCV/~~LCS~~ ❊ | I.V. 1201411 | N/A |

Reviewed By/Date: [illegible] 2/20/13

se book # 1198 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard #

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
ater LCS Spiking Concentration: 1.0 µg/ml

❊ LCS spiked with MS. [illegible] 2/18/13

ME-HgCVAA-Prep0910

Page #:

000000032
AAAAAAAA9

# WET CHEMISTRY

Lionville Laboratory, PADEP Lab ID# 15-00009
264 Welsh Pool Road
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Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:01 |

## Analytical Report for Wet Chemistry

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8 | 1302035-01 | Water | 02/13/2013 08:12 | 02/14/2013 09:08 |

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# Case Narrative

**Client:** WC-HANFORD RC-138 K4069
**LVL#:** 1302035 **Date Received:** 02-14-13

## INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods indicated on the data summary report.

   Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvL's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike (MS) recovery for Total Cyanide was within the 75-125% control limits however MS recovery for Total Phenols was above 90-110% control limits at 114%.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature, has authorized release of the data contained in this hard copy package.

Iain Daniels
Laboratory Manager
Lionville Laboratory

3/12/13
Date

njp\i02-035

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:01 |

## Notes and Definitions

| | |
|---|---|
| U | Analyte included in the analysis, but not detected |
| * | Value outside QC acceptance criteria |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| Dry | Sample results reported on a dry weight basis |
| Wet | Sample results reported on a wet weight basis |
| RPD | Relative Percent Difference |
| LOD | Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier. |
| LOQ | Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:01 |

# Wet Chemistry

## Lionville Laboratory

| Analyte | Result and Qualifier | | LOD | LOQ | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|---|
| **J1RDC8 (1302035-01) Water** | | | | | | | | | | |
| **Total Suspended Solids** | **24000** | | 5000 | 10000 | ug/L | 1 | L302122 | 02/15/2013 11:07 | 02/15/2013 11:07 | SM 2540D |
| Total Phenols | 10.0 | U | 10.0 | 50.0 | ug/L | 1 | L302123 | 02/15/2013 08:00 | 02/15/2013 12:51 | EPA 420.4 |
| Cyanide (total) | 5.00 | U | 5.00 | 10.0 | ug/L | 1 | L302143 | 02/20/2013 15:15 | 02/21/2013 15:43 | SM 4500-CN C, I |
| **Biochemical Oxygen Demand** | **39000** | | 1000 | 2000 | ug/L | 1 | L302121 | 02/14/2013 19:03 | 02/19/2013 14:05 | SM 5210B |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:01 |

# Wet Chemistry - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | LOD | LOQ | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302121 - Default Prep GenChem** | | | | | | | | | | |
| **Blank (L302121-BLK1)** | | | | Prepared: 02/14/2013 18:35 Analyzed: 02/19/2013 13:04 | | | | | | |
| Biochemical Oxygen Demand | 1000 U | 1000 | 2000 | ug/L | | | | | | |
| **LCS (L302121-BS1)** | | | | Prepared: 02/14/2013 18:35 Analyzed: 02/19/2013 13:04 | | | | | | |
| Biochemical Oxygen Demand | 170000 | 1000 | 2000 | ug/L | 198000 | | 85.6 | 84.6-115.4 | | |
| **Duplicate (L302121-DUP1)** | **Source: 1302035-01** | | | Prepared: 02/14/2013 19:03 Analyzed: 02/19/2013 14:05 | | | | | | |
| Biochemical Oxygen Demand | 37000 | 1000 | 2000 | ug/L | | 39000 | | | 5.26 | 20 |
| **Batch L302122 - Default Prep GenChem** | | | | | | | | | | |
| **Blank (L302122-BLK1)** | | | | Prepared & Analyzed: 02/15/2013 11:07 | | | | | | |
| Total Suspended Solids | 5000 U | 5000 | 10000 | ug/L | | | | | | |
| **LCS (L302122-BS1)** | | | | Prepared & Analyzed: 02/15/2013 11:07 | | | | | | |
| Total Suspended Solids | 87000 | 5000 | 10000 | ug/L | 100000 | | 87.0 | 80-120 | | |
| **LCS (L302122-BS2)** | | | | Prepared & Analyzed: 02/15/2013 11:07 | | | | | | |
| Total Suspended Solids | 92000 | 5000 | 10000 | ug/L | 100000 | | 92.0 | 80-120 | | |
| **Duplicate (L302122-DUP1)** | **Source: 1302035-01** | | | Prepared & Analyzed: 02/15/2013 11:07 | | | | | | |
| Total Suspended Solids | 23000 | 5000 | 10000 | ug/L | | 24000 | | | 4.26 | 20 |
| **Batch L302123 - Default Prep GenChem** | | | | | | | | | | |
| **Blank (L302123-BLK1)** | | | | Prepared: 02/15/2013 08:00 Analyzed: 02/15/2013 12:46 | | | | | | |
| Total Phenols | 10.0 U | 10.0 | 50.0 | ug/L | | | | | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:01 |

# Wet Chemistry - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | LOD | LOQ | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302123 - Default Prep GenChem** | | | | | | | | | | |
| **LCS (L302123-BS1)** | | | | Prepared: 02/15/2013 08:00 Analyzed: 02/15/2013 12:47 | | | | | | |
| Total Phenols | 75.6 | 10.0 | 50.0 | ug/L | 80.000 | | 94.5 | 90-110 | | |
| **LCS (L302123-BS2)** | | | | Prepared: 02/15/2013 08:00 Analyzed: 02/15/2013 12:48 | | | | | | |
| Total Phenols | 74.0 | 10.0 | 50.0 | ug/L | 80.000 | | 92.5 | 90-110 | | |
| **Duplicate (L302123-DUP1)** | **Source: 1302035-01** | | | Prepared: 02/15/2013 08:00 Analyzed: 02/15/2013 12:50 | | | | | | |
| Total Phenols | 10.0 U | 10.0 | 50.0 | ug/L | | 10.0 U | | | | 20 |
| **Matrix Spike (L302123-MS1)** | **Source: 1302035-01** | | | Prepared: 02/15/2013 08:00 Analyzed: 02/15/2013 12:50 | | | | | | |
| Total Phenols | 91.6 | 10.0 | 50.0 | ug/L | 80.000 | 10.0 U | 114* | 90-110 | | |
| **Batch L302143 - Default Prep GenChem** | | | | | | | | | | |
| **Blank (L302143-BLK1)** | | | | Prepared: 02/20/2013 12:57 Analyzed: 02/21/2013 15:40 | | | | | | |
| Cyanide (total) | 5.00 U | 5.00 | 10.0 | ug/L | | | | | | |
| **LCS (L302143-BS1)** | | | | Prepared: 02/20/2013 12:57 Analyzed: 02/21/2013 15:41 | | | | | | |
| Cyanide (total) | 19.7 | 5.00 | 10.0 | ug/L | 20.000 | | 98.7 | 80-120 | | |
| **LCS (L302143-BS2)** | | | | Prepared: 02/20/2013 12:57 Analyzed: 02/21/2013 15:42 | | | | | | |
| Cyanide (total) | 92.2 | 5.00 | 10.0 | ug/L | 100.00 | | 92.2 | 80-120 | | |
| **Duplicate (L302143-DUP1)** | **Source: 1302035-01** | | | Prepared: 02/20/2013 15:15 Analyzed: 02/21/2013 15:43 | | | | | | |
| Cyanide (total) | 5.00 U | 5.00 | 10.0 | ug/L | | 5.00 U | | | | 20 |
| **Matrix Spike (L302143-MS1)** | **Source: 1302035-01** | | | Prepared: 02/20/2013 15:15 Analyzed: 02/21/2013 15:44 | | | | | | |
| Cyanide (total) | 49.0 | 5.00 | 10.0 | ug/L | 50.000 | 5.00 U | 98.0 | 75-125 | | |

LIONVILLE LABORATORY
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12 March 2013

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

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

| | |
|---|---|
| LvLI Batch # | 1302036 |
| SDG # | K4069 |
| SAF # | RC-138 |
| Date Received | 02/15/13 |
| # Samples | 4 |
| Matrix | WATER |
| Volatiles | X |
| Semivolatiles | X |
| Pest/PCB | |
| Glycols | |
| DRO/KRO/GRO | |
| PAHs | |
| Herbicides | |
| Metals | |
| Inorganics | |

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 45 pages.

R:\GROUP\PM\ORLETTE\Hanford\Data\B_ltrs.DOC

# CHAIN OF CUSTODY

Lionville Laboratory Use Only

1302036

# Custody Transfer Record/Lab Work Request

Page 1 of 1

**FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS**

Lionville Laboratory
A Division of Eberline Analytical Corporation

Client: WC Hanford SAF# RC-138

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O. Johnson

QC: SW Del: SA TAT: 21

Date Rec'd: 2-15-13 Date Due: 3-8-13

| | | A-C | D |
|---|---|---|---|
| Refrigerator # | | VOA | 2 |
| #/Type Container | Liquid | 3AG | 1AG |
| | Solid | | |
| Volume | Liquid | 40 | 500 |
| | Solid | | |
| Preservatives | | HCl | – |

ANALYSES REQUESTED →

| ORGANIC | | | | INORG | |
|---|---|---|---|---|---|
| VOA | BNA | Pest/PCB | Herb | Metal | CN |

MATRIX CODES:
W Water
WW Waste Water
GW Groundwater
WST Waste
WI Wipe
SO Solid
S Soil
SL Sludge
SE Sediment
PC Paint Chips
O Oil
NAL Non-Aqueous Liquid
L Leachate
A Air
T Tissue
F Fish

| Lab ID | Client ID/Description | Matrix QC Chosen (✓) MS | MSD | Matrix | Date Collected | Time Collected | Lionville Laboratory Use Only: 624 | 625 |
|---|---|---|---|---|---|---|---|---|
| 01 | T1RDC8-A | | | Water | 2-13-13 | 0831 | X | X |
| 02 | B | | | | | 1003 | X | X |
| 03 | C | | | | | 1205 | X | X |
| 04 | D | | | | | 1400 | X | X |

Special Instructions:

Special Instructions:
2/15/13
1. analyze by 600 series methods for VOA + BNA
2. BNAS on hold awaiting client determination
3.
4.
5.
6.

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| [signature] | [signature] | 2/15/13 | 0940 |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Relinquished by | Received by | Date | Time |
|---|---|---|---|
| | | | |
| | | | |

| Washington Closure Hanford | CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST | RC-138-036 | Page 1 of 1 |
|---|---|---|---|
| Collector: Carl Phillips | Company Contact: Tom Edmundson; Telephone No.: 509.947.5192 | Project Coordinator: KESSNER, JH | Price Code: 7L; Data Turnaround: 21 Days |
| Project Designation: 300 Area Sanitary Sewer Sampling - Biannual Constituents | Sampling Location: 300 Area Sanitary Sewer Semi-Annual | SAF No.: RC-138 | |
| Ice Chest No.: RCC-08-022 | Field Logbook No.: EL 1518-26; COA: RD4MXX2F00 | Method of Shipment: FedEx | |
| Shipped To: Lionville Laboratory Incorporated | Offsite Property No.: A120737 | Bill of Lading/Air Bill No.: SEE OSPC | |

POSSIBLE SAMPLE HAZARDS/REMARKS

*pH < 2*

Special Handling and/or Storage

*Temp < 4 degrees C*

| Preservation | HNO3 to pH <2 | HNO3 to pH <2 | NaOH to pH >= 12 | HCl to pH <2 Cool 4C | Cool 4C | H2SO4 to pH <2 Cool 4C | Cool 4C | Cool 4C | Cool 4C | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type of Container | P/G | P/G | P/G | Gs* | aG | aG | aG | P/G | P/G | |
| No. of Container(s) | 1 | 2 | 2 | ~~12~~ 3 AJ 2-13-13 | ~~4~~ 1 AJ 2-13-13 | 1 | 2 | 1 | 1 | |
| Volume | 1L | 500mL | 1000mL | 40mL | 500mL | 1000mL | 1000mL | 500mL | 1L | |

SAMPLE ANALYSIS

| Sample No. | Matrix * | Sample Date | Sample Time | See item (1) in Special Instructions. | Mercury - 245.1 (CV) (Mercury) | Cyanide (Total) - SM4500 (Cyanide) | See item (2) in Special Instructions. | See item (3) in Special Instructions. | Phenolics Total Recoverable - 420.4 (Total Phenolics) | See item (4) in Special Instructions. | Solids - 2540D Total suspended solids | Biochemical Oxygen Demand (BOD) - 5210 (Biochemical Oxygen Demand) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1RDC8-A | WATER | 2/13/13 | 0831 | | | | ✓ | ✓ | | | | | |
| J1RDC8-B | ↓ | 2/13/13 | 1203 | | | | ✓ | ✓ | | | | | |
| J1RDC8-C | ↓ | 2/13/13 | 1205 | | | | ✓ | ✓ | | | | | |
| J1RDC8-D | ↓ | 2/13/13 | 1400 | | | | ✓ | ✓ | | | | | |

CHAIN OF POSSESSION — Sign/Print Names

| Relinquished By/Removed From | Date/Time | Received By/Stored In | Date/Time |
|---|---|---|---|
| Carl Phillips Carl Phillips | 2-13-13 1415 | David Encke David Encke | 2/13/13 1415 |
| David Encke David Encke | 2-13-13 1431 | A. Freier A. Freier (1060#1) | 1431 2-13-13 |
| A. Freier A. Freier (WCH) | 1060#1 2-14-13 1215 | Fed Ex | |
| Fed Ex | 2-15-13 0940 | VICTOR HERNANDEZ | 2-15-13 0940 |
| | | | |
| | | | |

SPECIAL INSTRUCTIONS

(1) Metals & Trace Elements by ICP - 200.7 {Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Zinc}
(2) Purgeables - 624 {1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, 1,2-Dichloropropane, 2-Chloroethyl vinyl ether, Acrolein, Acrylonitrile, Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform, Chloromethane, cis-1,3-Dichloropropene, Dibromochloromethane, Ethylbenzene, Methylenechloride, Tetrachloroethene, Toluene, trans-1,2-Dichloroethylene, trans-1,3-Dichloropropene, Trichloroethene, Vinyl chloride}
(3) Base/Neutrals and Acids - 625 {1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,2-Diphenylhydrazine, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chloronaphthalene, 2-Chlorophenol, 2-Nitrophenol, 3,3'-Dichlorobenzidine, 4,6-Dinitro-2-methylphenol, 4-Bromophenylphenyl ether, 4-Chloro-3-methylphenol, 4-Chlorophenylphenyl ether, 4-Nitrophenol, Acenaphthene, Acenaphthylene, Anthracene, Benzidine, Benzo(a)anthracene, Benzo(a)pyrene,

Matrix *

S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

| LABORATORY SECTION | Received By | Title | Date/Time |
|---|---|---|---|
| FINAL SAMPLE DISPOSITION | Disposal Method | Disposed By | Date/Time |

REVIEWED BY CMB DATE 2-14-13

WCH-EE-011

00000004

Lionville Laboratory

# SAMPLE RECEIPT CHECKLIST (SRC)

**CLIENT:** WC Hanford
Project/SAF/SOW/Release #: RC-138

**Date:** 2/15/13

**LvL Batch #:** 1302036

**Sample Custodian:** Victor Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

| | | | |
|---|---|---|---|
| **1.** Samples Hand Delivered or Shipped? | Carrier Fed Ex | | Airbill # 794758346442 |
| **2.** Custody Seals on coolers or shipping containers intact, signed & dated? | ☑ Yes | ☐ No | ☐ No Seals |
| **3.** Outside of coolers or shipping containers are free from damage? | ☑ Yes | ☐ No | *Comments:* |
| **4.** All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible? | ☑ Yes | ☐ No | |
| **5.** Samples received cooled or ambient? | **Temp** 2-3 | °C | Cooler # RCC-08-022 |
| How was the temperature taken? | ☑ IR | ☐ Temp. Blank | ☐ Other (Specify): |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | ☑ Yes | ☐ No | |
| **6.** Custody seals on sample containers intact, signed and dated? | ☑ Yes | ☐ No | ☐ No Seals |
| **7.** COC (Client & LvL) signed & dated? | ☑ Yes | ☐ No | |
| **8.** Sample containers are intact? | ☑ Yes | ☐ No | |
| **9.** All samples on COC received? | ☑ Yes | ☐ No | |
| All samples received on COC? | ☑ Yes | ☐ No | |
| **10.** All sample label information matches COC? | ☑ Yes | ☐ No | |
| **11.** Samples properly preserved? (If #5 is no, then this is no.) | ☑ Yes | ☐ No | |
| **12.** Samples received within hold times? | ☑ Yes | ☐ No | |
| Short holds taken to wet lab? | ☐ Yes | ☐ No | ☑ N/A |
| **13.** VOA, TOC, TOX, RSK-175, Sulfides, Non-Halogenated VOAs (Alcohol/Glycol) free of headspace? | ☑ Yes | ☐ No | ☐ N/A |
| **14.** QC stickers placed on bottles designated by client? | ☐ Yes | ☐ No | ☑ N/A |
| **15.** Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy, which is on the reverse of this page.) | ☑ Yes | ☐ No | |
| **16.** Project Manager contacted concerning any discrepancies? | ☐ Yes | ☐ No | ☑ N/A |

Person Contacted_____ Date _____

# VOLATILES

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## Analytical Report for Purgeable Organic Compounds by EPA 624

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8-A | 1302036-01 | Water | 02/13/2013 08:31 | 02/15/2013 09:40 |
| J1RDC8-B | 1302036-02 | Water | 02/13/2013 10:03 | 02/15/2013 09:40 |
| J1RDC8-C | 1302036-03 | Water | 02/13/2013 12:05 | 02/15/2013 09:40 |
| J1RDC8-D | 1302036-04 | Water | 02/13/2013 14:00 | 02/15/2013 09:40 |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

# Case Narrative

**Client:** WC-HANFORD RC-138 K4069
**LVL #:** 1302036

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 02-15-2013

## GC/MS VOLATILE

Four (4) water samples were collected on 02-13-2013.

The samples and associated QC samples were prepared and analyzed 02-15-2013 according to criteria set forth in Lionville Laboratory SOPs. The preparation procedure was based on Method 624 and the analysis procedure was based on Method 624 for client specified volatile target compounds.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. The results presented in this report are derived from samples that met LvL's sample acceptance policy.
2. The samples were analyzed within recommended holding time.
3. Non-target compounds were not detected in these samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within QC acceptance criteria.
6. All blank spike recoveries were within QC acceptance criteria.
7. The method blank was below the reporting limits for all target compounds.
8. All initial calibrations associated with this data set were within acceptance criteria.
9. The QC check analyzed on 02-15-2013 has been reported as the blank spike.
10. Manual integrations are performed according to SOP QA-125 to produce quality data with utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").


The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

11. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Iain Daniels
LvL Laboratory Manager

3/12/13
Date

# GLOSSARY

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture. |
| J | = | Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| D | = | Identifies all compounds identified in an analysis at a secondary dilution factor. |
| I | = | Interference. |
| NQ | = | Result qualitatively confirmed but not able to quantify. |
| A | = | Indicates that a TIC is a suspected aldol-condensation product. |
| N | = | Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used. |
| X | = | This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard). |
| Y | = | Additional qualifiers used as required are explained in the case narrative. |

# GLOSSARY

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

# TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

MP - Missed Peak: Manually added peak not found by automatic quantitation program.

PA - Peak Assignment: quantitation report was changed to reflect correct peak assignment.

RI - Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column.

SP - Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.

CB - Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background

PI - Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-A
## 1302036-01 (Water)

### Lionville Laboratory

**Purgeable Organic Compounds by EPA 624**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2,2-Tetrachloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloropropane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 2-Chloroethyl Vinyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Benzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromodichloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromoform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromomethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Carbon Tetrachloride | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chlorobenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloromethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| cis-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Dibromochloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Ethylbenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Methylene Chloride | 6.00 | U | 6.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Tetrachloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Toluene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,2-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Trichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Vinyl chloride | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrylonitrile | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrolein | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| *Surrogate: 1,2-Dichloroethane-d4* | *98 %* | | *60-140* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: Toluene-d8* | *100 %* | | *65-120* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: 4-Bromofluorobenzene* | *104 %* | | *75-130* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## J1RDC8-B
### 1302036-02 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Purgeable Organic Compounds by EPA 624** | | | | | | | | | |
| 1,1,1-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2,2-Tetrachloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloropropane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 2-Chloroethyl Vinyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Benzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromodichloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromoform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromomethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Carbon Tetrachloride | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chlorobenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloromethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| cis-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Dibromochloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Ethylbenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Methylene Chloride | 6.00 | U | 6.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Tetrachloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Toluene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,2-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Trichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Vinyl chloride | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrylonitrile | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrolein | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| *Surrogate: 1,2-Dichloroethane-d4* | *105 %* | | *60-140* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: Toluene-d8* | *99 %* | | *65-120* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: 4-Bromofluorobenzene* | *104 %* | | *75-130* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## J1RDC8-C
### 1302036-03 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Purgeable Organic Compounds by EPA 624** | | | | | | | | | |
| 1,1,1-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2,2-Tetrachloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloropropane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 2-Chloroethyl Vinyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Benzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromodichloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromoform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromomethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Carbon Tetrachloride | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chlorobenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| **Chloroform** | **1.39** | J | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloromethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| cis-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Dibromochloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Ethylbenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Methylene Chloride | 6.00 | U | 6.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Tetrachloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Toluene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,2-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Trichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Vinyl chloride | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrylonitrile | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrolein | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| *Surrogate: 1,2-Dichloroethane-d4* | *110 %* | | *60-140* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: Toluene-d8* | *104 %* | | *65-120* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: 4-Bromofluorobenzene* | *110 %* | | *75-130* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |

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Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-D
### 1302036-04 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Purgeable Organic Compounds by EPA 624** | | | | | | | | | |
| 1,1,1-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2,2-Tetrachloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1,2-Trichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,1-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloroethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 1,2-Dichloropropane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| 2-Chloroethyl Vinyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Benzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromodichloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromoform | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Bromomethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Carbon Tetrachloride | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chlorobenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloroethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| **Chloroform** | **1.09** | **J** | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Chloromethane | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| cis-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Dibromochloromethane | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Ethylbenzene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Methylene Chloride | 6.00 | U | 6.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Tetrachloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Toluene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,2-Dichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| trans-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Trichloroethene | 5.00 | U | 5.00 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Vinyl chloride | 10.0 | U | 10.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrylonitrile | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| Acrolein | 20.0 | U | 20.0 | ug/L | 1 | L302138 | 02/15/2013 | 02/15/2013 | EPA 624 |
| *Surrogate: 1,2-Dichloroethane-d4* | *113 %* | | *60-140* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: Toluene-d8* | *99 %* | | *65-120* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |
| *Surrogate: 4-Bromofluorobenzene* | *102 %* | | *75-130* | | | *L302138* | *02/15/2013* | *02/15/2013* | *EPA 624* |

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Purgeable Organic Compounds by EPA 624 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302138 - EPA 624** | | | | | | | | | | |
| **Blank (L302138-BLK1)** | | | | Prepared & Analyzed: 02/15/2013 | | | | | | |
| 1,1,1-Trichloroethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,1,2,2-Tetrachloroethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,1,2-Trichloroethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,1-Dichloroethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,1-Dichloroethene | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,2-Dichloroethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 1,2-Dichloropropane | 5.00 | U | 5.00 | ug/L | | | | | | |
| 2-Chloroethyl Vinyl Ether | 20.0 | U | 20.0 | ug/L | | | | | | |
| Benzene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Bromodichloromethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| Bromoform | 5.00 | U | 5.00 | ug/L | | | | | | |
| Bromomethane | 10.0 | U | 10.0 | ug/L | | | | | | |
| Carbon Tetrachloride | 5.00 | U | 5.00 | ug/L | | | | | | |
| Chlorobenzene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Chloroethane | 10.0 | U | 10.0 | ug/L | | | | | | |
| Chloroform | 5.00 | U | 5.00 | ug/L | | | | | | |
| Chloromethane | 10.0 | U | 10.0 | ug/L | | | | | | |
| cis-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Dibromochloromethane | 5.00 | U | 5.00 | ug/L | | | | | | |
| Ethylbenzene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Methylene Chloride | 6.00 | U | 6.00 | ug/L | | | | | | |
| Tetrachloroethene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Toluene | 5.00 | U | 5.00 | ug/L | | | | | | |
| trans-1,2-Dichloroethene | 5.00 | U | 5.00 | ug/L | | | | | | |
| trans-1,3-Dichloropropene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Trichloroethene | 5.00 | U | 5.00 | ug/L | | | | | | |
| Vinyl chloride | 10.0 | U | 10.0 | ug/L | | | | | | |
| Acrylonitrile | 20.0 | U | 20.0 | ug/L | | | | | | |
| Acrolein | 20.0 | U | 20.0 | ug/L | | | | | | |
| Tentatively Identified Compound | 0.00 | U | | ug/L | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *31.4* | | | *ug/L* | *30.000* | | *105* | *60-140* | | |
| *Surrogate: Toluene-d8* | *31.2* | | | *ug/L* | *30.000* | | *104* | *65-120* | | |
| *Surrogate: 4-Bromofluorobenzene* | *32.2* | | | *ug/L* | *30.000* | | *107* | *75-130* | | |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

# Purgeable Organic Compounds by EPA 624 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L302138 - EPA 624** | | | | | | | | | |
| **LCS (L302138-BS1)** | | | Prepared & Analyzed: 02/15/2013 | | | | | | |
| 1,1,1-Trichloroethane | 19.8 | 5.00 | ug/L | 20.000 | | 99 | 52-162 | | |
| 1,1,2,2-Tetrachloroethane | 17.6 | 5.00 | ug/L | 20.000 | | 88 | 46-157 | | |
| 1,1,2-Trichloroethane | 18.1 | 5.00 | ug/L | 20.000 | | 90 | 52-150 | | |
| 1,1-Dichloroethane | 19.9 | 5.00 | ug/L | 20.000 | | 99 | 59-155 | | |
| 1,1-Dichloroethene | 20.3 | 5.00 | ug/L | 20.000 | | 102 | 0-234 | | |
| 1,2-Dichloroethane | 18.5 | 5.00 | ug/L | 20.000 | | 92 | 49-155 | | |
| 1,2-Dichloropropane | 18.7 | 5.00 | ug/L | 20.000 | | 93 | 0-210 | | |
| Benzene | 19.5 | 5.00 | ug/L | 20.000 | | 97 | 37-151 | | |
| Bromodichloromethane | 17.9 | 5.00 | ug/L | 20.000 | | 89 | 35-155 | | |
| Bromoform | 16.0 | 5.00 | ug/L | 20.000 | | 80 | 45-169 | | |
| Bromomethane | 20.8 | 10.0 | ug/L | 20.000 | | 104 | 0-242 | | |
| Carbon Tetrachloride | 19.4 | 5.00 | ug/L | 20.000 | | 97 | 70-140 | | |
| Chlorobenzene | 19.0 | 5.00 | ug/L | 20.000 | | 95 | 37-160 | | |
| Chloroethane | 20.7 | 10.0 | ug/L | 20.000 | | 104 | 14-230 | | |
| Chloroform | 19.4 | 5.00 | ug/L | 20.000 | | 97 | 51-138 | | |
| Chloromethane | 17.9 | 10.0 | ug/L | 20.000 | | 89 | 0-273 | | |
| cis-1,3-Dichloropropene | 17.0 | 5.00 | ug/L | 20.000 | | 85 | 0-227 | | |
| Dibromochloromethane | 16.9 | 5.00 | ug/L | 20.000 | | 84 | 43-149 | | |
| Ethylbenzene | 18.4 | 5.00 | ug/L | 20.000 | | 92 | 37-162 | | |
| Methylene Chloride | 20.1 | 6.00 | ug/L | 20.000 | | 100 | 0-221 | | |
| Tetrachloroethene | 18.8 | 5.00 | ug/L | 20.000 | | 94 | 64-148 | | |
| Toluene | 20.4 | 5.00 | ug/L | 20.000 | | 102 | 47-150 | | |
| trans-1,2-Dichloroethene | 20.6 | 5.00 | ug/L | 20.000 | | 103 | 54-156 | | |
| trans-1,3-Dichloropropene | 17.8 | 5.00 | ug/L | 20.000 | | 89 | 17-183 | | |
| Trichloroethene | 19.1 | 5.00 | ug/L | 20.000 | | 96 | 71-157 | | |
| Vinyl chloride | 17.8 | 10.0 | ug/L | 20.000 | | 89 | 0-251 | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *30.5* | | *ug/L* | *30.000* | | *102* | *60-140* | | |
| *Surrogate: Toluene-d8* | *33.1* | | *ug/L* | *30.000* | | *110* | *65-120* | | |
| *Surrogate: 4-Bromofluorobenzene* | *34.5* | | *ug/L* | *30.000* | | *115* | *75-130* | | |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Purgeable Organic Compounds by EPA 624 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L302138 - EPA 624** | | | | | | | | | |
| **Matrix Spike (L302138-MS1)** | | **Source: 1302036-01** | Prepared & Analyzed: 02/15/2013 | | | | | | |
| 1,1,1-Trichloroethane | 23.9 | 5.00 | ug/L | 20.000 | 5.00 U | 120 | 52-162 | | |
| 1,1,2,2-Tetrachloroethane | 17.3 | 5.00 | ug/L | 20.000 | 5.00 U | 87 | 46-157 | | |
| 1,1,2-Trichloroethane | 18.7 | 5.00 | ug/L | 20.000 | 5.00 U | 93 | 52-150 | | |
| 1,1-Dichloroethane | 21.0 | 5.00 | ug/L | 20.000 | 5.00 U | 105 | 59-155 | | |
| 1,1-Dichloroethene | 18.9 | 5.00 | ug/L | 20.000 | 5.00 U | 95 | 0-234 | | |
| 1,2-Dichloroethane | 19.7 | 5.00 | ug/L | 20.000 | 5.00 U | 99 | 49-155 | | |
| 1,2-Dichloropropane | 20.1 | 5.00 | ug/L | 20.000 | 5.00 U | 101 | 0-210 | | |
| Benzene | 20.1 | 5.00 | ug/L | 20.000 | 5.00 U | 101 | 37-151 | | |
| Bromodichloromethane | 19.1 | 5.00 | ug/L | 20.000 | 5.00 U | 96 | 35-155 | | |
| Bromoform | 16.1 | 5.00 | ug/L | 20.000 | 5.00 U | 80 | 45-169 | | |
| Bromomethane | 21.7 | 10.0 | ug/L | 20.000 | 10.0 U | 108 | 0-242 | | |
| Carbon Tetrachloride | 20.7 | 5.00 | ug/L | 20.000 | 5.00 U | 103 | 70-140 | | |
| Chlorobenzene | 19.8 | 5.00 | ug/L | 20.000 | 5.00 U | 99 | 37-160 | | |
| Chloroethane | 22.6 | 10.0 | ug/L | 20.000 | 10.0 U | 113 | 14-230 | | |
| Chloroform | 21.8 | 5.00 | ug/L | 20.000 | 5.00 U | 109 | 51-138 | | |
| Chloromethane | 19.8 | 10.0 | ug/L | 20.000 | 10.0 U | 99 | 0-273 | | |
| cis-1,3-Dichloropropene | 15.7 | 5.00 | ug/L | 20.000 | 5.00 U | 79 | 0-227 | | |
| Dibromochloromethane | 17.3 | 5.00 | ug/L | 20.000 | 5.00 U | 87 | 43-149 | | |
| Ethylbenzene | 19.3 | 5.00 | ug/L | 20.000 | 5.00 U | 97 | 37-162 | | |
| Methylene Chloride | 20.8 | 6.00 | ug/L | 20.000 | 6.00 U | 104 | 0-221 | | |
| Tetrachloroethene | 19.6 | 5.00 | ug/L | 20.000 | 5.00 U | 98 | 64-148 | | |
| Toluene | 21.3 | 5.00 | ug/L | 20.000 | 5.00 U | 107 | 47-150 | | |
| trans-1,2-Dichloroethene | 21.6 | 5.00 | ug/L | 20.000 | 5.00 U | 108 | 54-156 | | |
| trans-1,3-Dichloropropene | 17.7 | 5.00 | ug/L | 20.000 | 5.00 U | 88 | 17-183 | | |
| Trichloroethene | 20.0 | 5.00 | ug/L | 20.000 | 5.00 U | 100 | 71-157 | | |
| Vinyl chloride | 19.5 | 10.0 | ug/L | 20.000 | 10.0 U | 98 | 0-251 | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *31.9* | | *ug/L* | *30.000* | | *106* | *60-140* | | |
| *Surrogate: Toluene-d8* | *34.0* | | *ug/L* | *30.000* | | *113* | *65-120* | | |
| *Surrogate: 4-Bromofluorobenzene* | *35.1* | | *ug/L* | *30.000* | | *117* | *75-130* | | |

264 Welsh Pool Road
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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## Purgeable Organic Compounds by EPA 624 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L302138 - EPA 624** | | | | | | | | | |
| **Matrix Spike Dup (L302138-MSD1)** | | **Source: 1302036-01** | Prepared & Analyzed: 02/15/2013 | | | | | | |
| 1,1,1-Trichloroethane | 22.1 | 5.00 | ug/L | 20.000 | 5.00 U | 111 | 52-162 | 8 | 20 |
| 1,1,2,2-Tetrachloroethane | 19.0 | 5.00 | ug/L | 20.000 | 5.00 U | 95 | 46-157 | 9 | 20 |
| 1,1,2-Trichloroethane | 18.9 | 5.00 | ug/L | 20.000 | 5.00 U | 94 | 52-150 | 1 | 20 |
| 1,1-Dichloroethane | 20.5 | 5.00 | ug/L | 20.000 | 5.00 U | 102 | 59-155 | 3 | 20 |
| 1,1-Dichloroethene | 18.5 | 5.00 | ug/L | 20.000 | 5.00 U | 92 | 0-234 | 3 | 20 |
| 1,2-Dichloroethane | 19.6 | 5.00 | ug/L | 20.000 | 5.00 U | 98 | 49-155 | 0.7 | 20 |
| 1,2-Dichloropropane | 19.8 | 5.00 | ug/L | 20.000 | 5.00 U | 99 | 0-210 | 2 | 20 |
| Benzene | 19.7 | 5.00 | ug/L | 20.000 | 5.00 U | 99 | 37-151 | 2 | 20 |
| Bromodichloromethane | 18.7 | 5.00 | ug/L | 20.000 | 5.00 U | 93 | 35-155 | 3 | 20 |
| Bromoform | 17.0 | 5.00 | ug/L | 20.000 | 5.00 U | 85 | 45-169 | 5 | 20 |
| Bromomethane | 21.1 | 10.0 | ug/L | 20.000 | 10.0 U | 106 | 0-242 | 3 | 20 |
| Carbon Tetrachloride | 19.4 | 5.00 | ug/L | 20.000 | 5.00 U | 97 | 70-140 | 6 | 20 |
| Chlorobenzene | 19.7 | 5.00 | ug/L | 20.000 | 5.00 U | 98 | 37-160 | 0.7 | 20 |
| Chloroethane | 21.0 | 10.0 | ug/L | 20.000 | 10.0 U | 105 | 14-230 | 7 | 20 |
| Chloroform | 20.8 | 5.00 | ug/L | 20.000 | 5.00 U | 104 | 51-138 | 5 | 20 |
| Chloromethane | 19.0 | 10.0 | ug/L | 20.000 | 10.0 U | 95 | 0-273 | 4 | 20 |
| cis-1,3-Dichloropropene | 15.0 | 5.00 | ug/L | 20.000 | 5.00 U | 75 | 0-227 | 4 | 20 |
| Dibromochloromethane | 17.6 | 5.00 | ug/L | 20.000 | 5.00 U | 88 | 43-149 | 1 | 20 |
| Ethylbenzene | 18.7 | 5.00 | ug/L | 20.000 | 5.00 U | 94 | 37-162 | 3 | 20 |
| Methylene Chloride | 20.2 | 6.00 | ug/L | 20.000 | 6.00 U | 101 | 0-221 | 3 | 20 |
| Tetrachloroethene | 19.0 | 5.00 | ug/L | 20.000 | 5.00 U | 95 | 64-148 | 3 | 20 |
| Toluene | 20.8 | 5.00 | ug/L | 20.000 | 5.00 U | 104 | 47-150 | 2 | 20 |
| trans-1,2-Dichloroethene | 20.2 | 5.00 | ug/L | 20.000 | 5.00 U | 101 | 54-156 | 7 | 20 |
| trans-1,3-Dichloropropene | 17.6 | 5.00 | ug/L | 20.000 | 5.00 U | 88 | 17-183 | 0.5 | 20 |
| Trichloroethene | 19.3 | 5.00 | ug/L | 20.000 | 5.00 U | 97 | 71-157 | 4 | 20 |
| Vinyl chloride | 17.9 | 10.0 | ug/L | 20.000 | 10.0 U | 90 | 0-251 | 9 | 20 |
| *Surrogate: 1,2-Dichloroethane-d4* | *32.3* | | *ug/L* | *30.000* | | *108* | *60-140* | | |
| *Surrogate: Toluene-d8* | *33.6* | | *ug/L* | *30.000* | | *112* | *65-120* | | |
| *Surrogate: 4-Bromofluorobenzene* | *35.8* | | *ug/L* | *30.000* | | *119* | *75-130* | | |

# PREPARATION BENCH SHEET

L302138

**Lionville Laboratory**

**Printed: 2/21/2013 1:43:22PM**

**Matrix: Water** **Prepared using: VOAGCMS - EPA 624** **Surrogate used: 0902344**

| Lab Number | Analysis | Prepared | Initial (mL) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1302036-01 | 624 VOC | 02/15/2013 10:52 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-02 | 624 VOC | 02/15/2013 11:26 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-03 | 624 VOC | 02/15/2013 11:59 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-04 | 624 VOC | 02/15/2013 12:33 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| L302138-BLK1 | QC | 02/15/2013 09:34 | 5 | 5 | | | | 3 | | |
| L302138-BS1 | QC | 02/15/2013 08:43 | 5 | 5 | 1201717 | | 2 | 3 | | |
| L302138-MS1 | QC | 02/15/2013 13:30 | 5 | 5 | 1201717 | 1302036-01 | 2 | 3 | | |
| L302138-MSD1 | QC | 02/15/2013 14:04 | 5 | 5 | 1201717 | 1302036-01 | 2 | 3 | | |

Revision for prep method Rev 2/21/13

Extracts Relinquished By Date Extracts Received By Date

# PREPARATION BENCH SHEET

L302138

**Lionville Laboratory**

**Printed: 2/19/2013 12:16:59PM**

**Matrix: Water** **Prepared using: VOAGCMS - SW 5030B** **Surrogate used: 0902344**

| Lab Number | Analysis | Prepared | Initial (mL) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1302036-01 | 624 VOC | 02/15/2013 10:52 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-02 | 624 VOC | 02/15/2013 11:26 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-03 | 624 VOC | 02/15/2013 11:59 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| 1302036-04 | 624 VOC | 02/15/2013 12:33 | 5 | 5 | | | | 3 | WC-Hanford, Inc. | |
| L302138-BLK1 | QC | 02/15/2013 09:34 | 5 | 5 | | | | 3 | | |
| L302138-BS1 | QC | 02/15/2013 08:43 | 5 | 5 | 1201717 | | 2 | 3 | | |
| L302138-MS1 | QC | 02/15/2013 13:30 | 5 | 5 | 1201717 | 1302036-01 | 2 | 3 | | |
| L302138-MSD1 | QC | 02/15/2013 14:04 | 5 | 5 | 1201717 | 1302036-01 | 2 | 3 | | |

m 2/19/13

Extracts Relinquished By Date

NA 2/21/13

Extracts Received By Date

# SEMIVOLATILES

264 Welsh Pool Road
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Analytical Report for Semivolatile Organic Compounds by EPA 625

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| J1RDC8-A | 1302036-01 | Water | 02/13/2013 08:31 | 02/15/2013 09:40 |
| J1RDC8-B | 1302036-02 | Water | 02/13/2013 10:03 | 02/15/2013 09:40 |
| J1RDC8-C | 1302036-03 | Water | 02/13/2013 12:05 | 02/15/2013 09:40 |
| J1RDC8-D | 1302036-04 | Water | 02/13/2013 14:00 | 02/15/2013 09:40 |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

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# Case Narrative

**Client:** WC-HANFORD RC-138 K4069
**LVL #:** 1302036

**W.O. #:** 60049-001-001-0001-00
**Date Received:** 02-15-2013

## GCMS SEMIVOLATILE

Four (4) water samples were collected on 02-13-2013.

The samples and associated QC samples were extracted 02-19-2013 and analyzed 02-21-2013 according to criteria set forth in Lionville Laboratory SOPs. The extraction procedure was based on Method 625 (Liquid/Liquid) and the analysis procedure was based on Method 625 for Client Specified Semivolatile target compounds.

Lionville Laboratory (LvL) is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements:

1. All results presented in this report are derived from samples that met LvL's sample acceptance policy.

2. The samples were extracted and analyzed within holding time.

3. Non-target compounds were detected in these samples.

4. Three (3) of forty-two (42) surrogate recoveries were outside QC acceptance criteria. The surrogate recovery criteria were not met for the following samples: L302139-BSD1, J1RDC8-B, and J1RDC8-C. The surrogate Phenol –d5 was marginally above acceptance criteria in sample L302139-BSD1 (95% (10-94%)). The associated blank and blank spike fulfills the reanalysis requirement. The surrogate p-Terphenyl-d14 was below acceptance criteria in samples J1RDC8-B and J1RDC8-C. Samples were non-detect for all target compounds. The samples have been reported with minimal impact on the data.

5. The method blank was below the reporting limit for all target compounds.

6. Two (2) of one hundred-sixteen (116) blank spike recoveries were outside QC acceptance criteria. A copy of the Sample Discrepancy Report (SDR# 13MS013) has been enclosed. All the samples were associated with this blank spike.

7. All initial calibrations associated with this data set were within acceptance criteria.

8. The tune analyzed on 02-21-2013, instrument 5972N, was within acceptance criteria with the exception on the Benzidine tailing factor.

9. The second source calibration verification was within acceptance criteria with the exception of the target compound Benzidine analyzed on 02-21-2013, instrument 5972N.


The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

10. Internal standard area and retention time criteria were met.

11. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").

12. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hardcopy package has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Iain Daniels
LvL Laboratory Manager

5/18/12
Date

# Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 13MS013

Initiator: Shawn Saylor
Date: 2-15-13
Client: ~~WCH/Hanford~~

Batch: 1302036
Samples: L302139-BSD1
Method: SW846/MCAWW/CLP/625

Parameter: 625
Matrix: Aqueous
Prep Batch: L302139

**1. Reason for SDR**

**a. COC Discrepancy** __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

**b. General Discrepancy**

__ Missing Sample/Extract* __ Container Broken* __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

**c. Problem** (Include all relevant specific results; attach data if necessary)

(1) 2 Spike recoveries outside QC acceptance limits in L302139-BSD1 but L302139-BS1 is OK (2-chloronaphthalene - Hexachlorobenzene) RCC 2/25/13

**2. Known or Probable Causes(s)** ? Associated samples ND for all target compds Minimal impact on the data RCC 2/25/13

**3. Discussion and Proposed Action** Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

narrate

2/28/13

**4. Project Manager Instructions**...signature/date: _____

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
✓ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

3/12/13

**5. Final Action**...signature/date: _____ Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
✓ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

**When Final Action has been recorded, forward original to QA for diposition.**

Route
__ Lab Manager: Daniels
__ Project Mgr (circle): Johnson / Stone
__ Sample Prep (circle): Ford
__ Log-in: King

Route
__ Metals: Welsh / _____
__ Inorganic: Perrone / _____
__ GC/LC: Carey / _____
__ MS-VOA: Rubino / _____
__ MS BNA: Carden / _____
__ Other: _____

QA-139-A-0208

# GLOSSARY

## DATA QUALIFIERS

| | | |
|---|---|---|
| U | = | Indicates that the compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit, which is included and corrected for dilution and percent moisture. |
| J | = | Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J. |
| B | = | This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound. |
| E | = | Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution. |
| D | = | Identifies all compounds identified in an analysis at a secondary dilution factor. |
| I | = | Interference. |
| NQ | = | Result qualitatively confirmed but not able to quantify. |
| A | = | Indicates that a TIC is a suspected aldol-condensation product. |
| N | = | Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used. |
| X | = | This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard). |
| Y | = | Additional qualifiers used as required are explained in the case narrative. |

# GLOSSARY

## ABBREVIATIONS

| | | |
|---|---|---|
| BS | = | Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported. |
| BSD | = | Indicates blank spike duplicate. |
| MS | = | Indicates matrix spike. |
| MSD | = | Indicates matrix spike duplicate. |
| DL | = | Suffix added to sample number to indicate that results are from a diluted analysis. |
| NA | = | Not Applicable. |
| DF | = | Dilution Factor. |
| NR | = | Not Required. |
| SP, Z | = | Indicates Spiked Compound. |

## TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

| | | |
|---|---|---|
| MP | - | Missed Peak: Manually added peak not found by automatic quantitation program. |
| PA | - | Peak Assignment: quantitation report was changed to reflect correct peak assignment. |
| RI | - | Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene, which are poorly resolved on the BNA column. |
| SP | - | Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area. |
| CB | - | Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background |
| PI | - | Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually. |

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| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## J1RDC8-A
## 1302036-01 (Water)

### Lionville Laboratory

**Semivolatile Organic Compounds by EPA 625**

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,3-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,4-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4,6-Trichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dimethylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrophenol | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,6-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chloronaphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Nitrophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3,3'-Dichlorobenzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4,6-Dinitro-2-methylphenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Bromophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chloro-3-methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chlorophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3- and/or 4-Methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Nitrophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benz[a]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[a] pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[b] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[g,h,i] perylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[k] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethoxy) methane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroisopropyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-ethylhexyl) phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Butyl Benzyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Chrysene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dibenz[a,h]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |

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| | | |
|---|---|---|
| WC-Hanford, Inc.<br>2620 Fermi Avenue<br>Richland WA, 99354 | Project: RC-138<br>Project Number: K4069<br>Project Manager: Joan Kessner | **Reported:**<br>03/11/2013 18:08 |

## J1RDC8-A
### 1302036-01 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| Diethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dimethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-butyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-octyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluorene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobutadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorocyclopentadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachloroethane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Indeno[1,2,3-cd]pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Isophorone | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Naphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Nitrobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodimethylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodi-n-propylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodiphenylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pentachlorophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenanthrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Diphenylhydrazine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 2** | **37.2** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 1** | **4.74** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| *Surrogate: 2-Fluorophenol* | *76 %* | | *21-100* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Phenol-d5* | *65 %* | | *10-94* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Nitrobenzene-d5* | *76 %* | | *35-114* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2-Fluorobiphenyl* | *78 %* | | *43-116* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2,4,6-Tribromophenol* | *65 %* | | *10-123* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: p-Terphenyl-d14* | *81 %* | | *33-141* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-B
### 1302036-02 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,3-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,4-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4,6-Trichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dimethylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrophenol | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,6-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chloronaphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Nitrophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3,3'-Dichlorobenzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4,6-Dinitro-2-methylphenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Bromophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chloro-3-methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chlorophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3- and/or 4-Methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Nitrophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benz[a]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[a] pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[b] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[g,h,i] perylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[k] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethoxy) methane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroisopropyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-ethylhexyl) phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Butyl Benzyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Chrysene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dibenz[a,h]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-B
### 1302036-02 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| Diethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dimethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-butyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-octyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluorene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobutadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorocyclopentadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachloroethane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Indeno[1,2,3-cd]pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Isophorone | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Naphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Nitrobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodimethylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodi-n-propylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodiphenylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pentachlorophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenanthrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Diphenylhydrazine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 5** | **30.7** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 4** | **23.2** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 2** | **25.9** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 1** | **21.7** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 3** | **27.6** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| *Surrogate: 2-Fluorophenol* | *66 %* | | *21-100* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Phenol-d5* | *65 %* | | *10-94* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Nitrobenzene-d5* | *62 %* | | *35-114* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2-Fluorobiphenyl* | *64 %* | | *43-116* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2,4,6-Tribromophenol* | *67 %* | | *10-123* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: p-Terphenyl-d14* | *22 % ** | | *33-141* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |

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Phone: 610-280-3000
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|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-C
### 1302036-03 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,3-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,4-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4,6-Trichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dimethylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrophenol | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,6-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chloronaphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Nitrophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3,3'-Dichlorobenzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4,6-Dinitro-2-methylphenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Bromophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chloro-3-methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chlorophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3- and/or 4-Methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Nitrophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benz[a]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[a] pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[b] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[g,h,i] perylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[k] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethoxy) methane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroisopropyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-ethylhexyl) phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Butyl Benzyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Chrysene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dibenz[a,h]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-C
### 1302036-03 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| Diethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dimethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-butyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-octyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluorene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobutadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorocyclopentadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachloroethane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Indeno[1,2,3-cd]pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Isophorone | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Naphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Nitrobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodimethylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodi-n-propylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodiphenylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pentachlorophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenanthrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Diphenylhydrazine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 4** | **31.9** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 3** | **35.3** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 2** | **30.2** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 1** | **29.0** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 5** | **33.5** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| *Surrogate: 2-Fluorophenol* | *54 %* | | *21-100* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Phenol-d5* | *55 %* | | *10-94* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Nitrobenzene-d5* | *53 %* | | *35-114* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2-Fluorobiphenyl* | *55 %* | | *43-116* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2,4,6-Tribromophenol* | *68 %* | | *10-123* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: p-Terphenyl-d14* | *28 % ** | | *33-141* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |

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Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-D
### 1302036-04 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,3-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,4-Dichlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4,6-Trichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dichlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dimethylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrophenol | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,4-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2,6-Dinitrotoluene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chloronaphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Chlorophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 2-Nitrophenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3,3'-Dichlorobenzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4,6-Dinitro-2-methylphenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Bromophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chloro-3-methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Chlorophenyl Phenyl Ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 3- and/or 4-Methylphenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 4-Nitrophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Acenaphthylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benz[a]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzidine | 100 | U | 100 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[a] pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[b] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[g,h,i] perylene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Benzo[k] fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethoxy) methane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroethyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-chloroisopropyl) ether | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Bis(2-ethylhexyl) phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Butyl Benzyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Chrysene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dibenz[a,h]anthracene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## J1RDC8-D
### 1302036-04 (Water)

| Analyte | Result and Qualifier | | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method |
|---|---|---|---|---|---|---|---|---|---|
| **Lionville Laboratory** | | | | | | | | | |
| **Semivolatile Organic Compounds by EPA 625** | | | | | | | | | |
| Diethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Dimethyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-butyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Di-n-octyl Phthalate | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluoranthene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Fluorene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorobutadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachlorocyclopentadiene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Hexachloroethane | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Indeno[1,2,3-cd]pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Isophorone | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Naphthalene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Nitrobenzene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodimethylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodi-n-propylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| N-Nitrosodiphenylamine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pentachlorophenol | 50.0 | U | 50.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenanthrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Phenol | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| Pyrene | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| 1,2-Diphenylhydrazine | 20.0 | U | 20.0 | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 3** | **13.7** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 2** | **13.7** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 1** | **10.2** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 4** | **10.4** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| **TIC:Unknown 5** | **14.7** | J | | ug/L | 1 | L302139 | 02/19/2013 | 02/21/2013 | EPA 625 |
| *Surrogate: 2-Fluorophenol* | *64 %* | | *21-100* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Phenol-d5* | *70 %* | | *10-94* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: Nitrobenzene-d5* | *65 %* | | *35-114* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2-Fluorobiphenyl* | *69 %* | | *43-116* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: 2,4,6-Tribromophenol* | *75 %* | | *10-123* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |
| *Surrogate: p-Terphenyl-d14* | *33 %* | | *33-141* | | | *L302139* | *02/19/2013* | *02/21/2013* | *EPA 625* |

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | | |
| **Blank (L302139-BLK1)** | | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| 1,2,4-Trichlorobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 1,2-Dichlorobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 1,3-Dichlorobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 1,4-Dichlorobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2,4,6-Trichlorophenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2,4-Dichlorophenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2,4-Dimethylphenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2,4-Dinitrophenol | 50.0 | U | 50.0 | ug/L | | | | | | |
| 2,4-Dinitrotoluene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2,6-Dinitrotoluene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2-Chloronaphthalene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2-Chlorophenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 2-Nitrophenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 3,3'-Dichlorobenzidine | 50.0 | U | 50.0 | ug/L | | | | | | |
| 4,6-Dinitro-2-methylphenol | 25.0 | U | 25.0 | ug/L | | | | | | |
| 4-Bromophenyl Phenyl Ether | 10.0 | U | 10.0 | ug/L | | | | | | |
| 4-Chloro-3-methylphenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 4-Chlorophenyl Phenyl Ether | 10.0 | U | 10.0 | ug/L | | | | | | |
| 3- and/or 4-Methylphenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| 4-Nitrophenol | 25.0 | U | 25.0 | ug/L | | | | | | |
| Acenaphthene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Acenaphthylene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Anthracene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Benz[a]anthracene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Benzidine | 50.0 | U | 50.0 | ug/L | | | | | | |
| Benzo[a] pyrene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Benzo[b] fluoranthene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Benzo[g,h,i] perylene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Benzo[k] fluoranthene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Bis(2-chloroethoxy) methane | 10.0 | U | 10.0 | ug/L | | | | | | |
| Bis(2-chloroethyl) ether | 10.0 | U | 10.0 | ug/L | | | | | | |
| Bis(2-chloroisopropyl) ether | 10.0 | U | 10.0 | ug/L | | | | | | |
| Bis(2-ethylhexyl) phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Butyl Benzyl Phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Chrysene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Dibenz[a,h]anthracene | 10.0 | U | 10.0 | ug/L | | | | | | |

264 Welsh Pool Road
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Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | | |
| **Blank (L302139-BLK1)** | | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| Diethyl Phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Dimethyl Phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Di-n-butyl Phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Di-n-octyl Phthalate | 10.0 | U | 10.0 | ug/L | | | | | | |
| Fluoranthene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Fluorene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Hexachlorobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Hexachlorobutadiene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Hexachlorocyclopentadiene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Hexachloroethane | 10.0 | U | 10.0 | ug/L | | | | | | |
| Indeno[1,2,3-cd]pyrene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Isophorone | 10.0 | U | 10.0 | ug/L | | | | | | |
| Naphthalene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Nitrobenzene | 10.0 | U | 10.0 | ug/L | | | | | | |
| N-Nitrosodimethylamine | 10.0 | U | 10.0 | ug/L | | | | | | |
| N-Nitrosodi-n-propylamine | 10.0 | U | 10.0 | ug/L | | | | | | |
| N-Nitrosodiphenylamine | 10.0 | U | 10.0 | ug/L | | | | | | |
| Pentachlorophenol | 25.0 | U | 25.0 | ug/L | | | | | | |
| Phenanthrene | 10.0 | U | 10.0 | ug/L | | | | | | |
| Phenol | 10.0 | U | 10.0 | ug/L | | | | | | |
| Pyrene | 10.0 | U | 10.0 | ug/L | | | | | | |
| 1,2-Diphenylhydrazine | 10.0 | U | 10.0 | ug/L | | | | | | |
| *Surrogate: 2-Fluorophenol* | *63.6* | | | *ug/L* | *75.000* | | *85* | *21-100* | | |
| *Surrogate: Phenol-d5* | *67.8* | | | *ug/L* | *75.000* | | *90* | *10-94* | | |
| *Surrogate: Nitrobenzene-d5* | *43.7* | | | *ug/L* | *50.000* | | *87* | *35-114* | | |
| *Surrogate: 2-Fluorobiphenyl* | *43.7* | | | *ug/L* | *50.000* | | *87* | *43-116* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *63.5* | | | *ug/L* | *75.000* | | *85* | *10-123* | | |
| *Surrogate: p-Terphenyl-d14* | *45.6* | | | *ug/L* | *50.000* | | *91* | *33-141* | | |

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Phone: 610-280-3000
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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | | |
| **LCS (L302139-BS1)** | | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| 1,2,4-Trichlorobenzene | 40.8 | | 10.0 | ug/L | 60.000 | | 68 | 44-142 | | |
| 1,2-Dichlorobenzene | 36.3 | | 10.0 | ug/L | 60.000 | | 60 | 32-129 | | |
| 1,3-Dichlorobenzene | 32.1 | | 10.0 | ug/L | 60.000 | | 53 | 1-172 | | |
| 1,4-Dichlorobenzene | 33.3 | | 10.0 | ug/L | 60.000 | | 56 | 20-124 | | |
| 2,4,6-Trichlorophenol | 61.3 | | 10.0 | ug/L | 60.000 | | 102 | 37-144 | | |
| 2,4-Dichlorophenol | 58.7 | | 10.0 | ug/L | 60.000 | | 98 | 39-135 | | |
| 2,4-Dimethylphenol | 52.8 | | 10.0 | ug/L | 60.000 | | 88 | 32-119 | | |
| 2,4-Dinitrophenol | 33.2 | J | 50.0 | ug/L | 60.000 | | 55 | 1-191 | | |
| 2,4-Dinitrotoluene | 64.9 | | 10.0 | ug/L | 60.000 | | 108 | 39-139 | | |
| 2,6-Dinitrotoluene | 63.4 | | 10.0 | ug/L | 60.000 | | 106 | 50-158 | | |
| 2-Chloronaphthalene | 56.7 | | 10.0 | ug/L | 60.000 | | 94 | 80-118 | | |
| 2-Chlorophenol | 57.5 | | 10.0 | ug/L | 60.000 | | 96 | 23-134 | | |
| 2-Nitrophenol | 57.5 | | 10.0 | ug/L | 60.000 | | 96 | 29-182 | | |
| 3,3'-Dichlorobenzidine | 66.5 | | 50.0 | ug/L | 60.000 | | 111 | 1-262 | | |
| 4,6-Dinitro-2-methylphenol | 69.2 | | 25.0 | ug/L | 60.000 | | 115 | 1-181 | | |
| 4-Bromophenyl Phenyl Ether | 61.5 | | 10.0 | ug/L | 60.000 | | 102 | 53-127 | | |
| 4-Chloro-3-methylphenol | 61.1 | | 10.0 | ug/L | 60.000 | | 102 | 22-147 | | |
| 4-Chlorophenyl Phenyl Ether | 60.1 | | 10.0 | ug/L | 60.000 | | 100 | 25-158 | | |
| 3- and/or 4-Methylphenol | 59.7 | | 10.0 | ug/L | 60.000 | | 100 | 40-110 | | |
| 4-Nitrophenol | 65.6 | | 25.0 | ug/L | 60.000 | | 109 | 1-132 | | |
| Acenaphthene | 59.0 | | 10.0 | ug/L | 60.000 | | 98 | 47-145 | | |
| Acenaphthylene | 62.0 | | 10.0 | ug/L | 60.000 | | 103 | 33-145 | | |
| Anthracene | 62.6 | | 10.0 | ug/L | 60.000 | | 104 | 27-133 | | |
| Benz[a]anthracene | 65.6 | | 10.0 | ug/L | 60.000 | | 109 | 33-143 | | |
| Benzidine | 31.3 | J | 50.0 | ug/L | 60.000 | | 52 | 1-180 | | |
| Benzo[a] pyrene | 67.7 | | 10.0 | ug/L | 60.000 | | 113 | 50-140 | | |
| Benzo[b] fluoranthene | 67.7 | | 10.0 | ug/L | 60.000 | | 113 | 50-140 | | |
| Benzo[g,h,i] perylene | 69.1 | | 10.0 | ug/L | 60.000 | | 115 | 50-140 | | |
| Benzo[k] fluoranthene | 64.6 | | 10.0 | ug/L | 60.000 | | 108 | 50-140 | | |
| Bis(2-chloroethoxy) methane | 56.6 | | 10.0 | ug/L | 60.000 | | 94 | 33-184 | | |
| Bis(2-chloroethyl) ether | 54.5 | | 10.0 | ug/L | 60.000 | | 91 | 12-158 | | |
| Bis(2-chloroisopropyl) ether | 53.0 | | 10.0 | ug/L | 60.000 | | 88 | 36-166 | | |
| Bis(2-ethylhexyl) phthalate | 73.0 | | 10.0 | ug/L | 60.000 | | 122 | 8-158 | | |
| Butyl Benzyl Phthalate | 65.9 | | 10.0 | ug/L | 60.000 | | 110 | 1-152 | | |
| Chrysene | 66.5 | | 10.0 | ug/L | 60.000 | | 111 | 17-168 | | |
| Dibenz[a,h]anthracene | 68.1 | | 10.0 | ug/L | 60.000 | | 113 | 1-227 | | |

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | |
| **LCS (L302139-BS1)** | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| Diethyl Phthalate | 53.9 | 10.0 | ug/L | 60.000 | | 90 | 1-114 | | |
| Dimethyl Phthalate | 49.4 | 10.0 | ug/L | 60.000 | | 82 | 50-140 | | |
| Di-n-butyl Phthalate | 58.8 | 10.0 | ug/L | 60.000 | | 98 | 40-150 | | |
| Di-n-octyl Phthalate | 73.4 | 10.0 | ug/L | 60.000 | | 122 | 50-150 | | |
| Fluoranthene | 62.3 | 10.0 | ug/L | 60.000 | | 104 | 26-137 | | |
| Fluorene | 60.3 | 10.0 | ug/L | 60.000 | | 101 | 59-121 | | |
| Hexachlorobenzene | 60.9 | 10.0 | ug/L | 60.000 | | 101 | 1-152 | | |
| Hexachlorobutadiene | 37.0 | 10.0 | ug/L | 60.000 | | 62 | 24-116 | | |
| Hexachlorocyclopentadiene | 37.3 | 10.0 | ug/L | 60.000 | | 62 | 1-180 | | |
| Hexachloroethane | 26.5 | 10.0 | ug/L | 60.000 | | 44 | 40-113 | | |
| Indeno[1,2,3-cd]pyrene | 69.2 | 10.0 | ug/L | 60.000 | | 115 | 1-171 | | |
| Isophorone | 54.6 | 10.0 | ug/L | 60.000 | | 91 | 21-196 | | |
| Naphthalene | 53.4 | 10.0 | ug/L | 60.000 | | 89 | 21-133 | | |
| Nitrobenzene | 54.2 | 10.0 | ug/L | 60.000 | | 90 | 35-180 | | |
| N-Nitrosodimethylamine | 53.0 | 10.0 | ug/L | 60.000 | | 88 | 1-180 | | |
| N-Nitrosodi-n-propylamine | 58.1 | 10.0 | ug/L | 60.000 | | 97 | 40-120 | | |
| N-Nitrosodiphenylamine | 59.4 | 10.0 | ug/L | 60.000 | | 99 | 1-180 | | |
| Pentachlorophenol | 70.5 | 25.0 | ug/L | 60.000 | | 117 | 14-176 | | |
| Phenanthrene | 62.2 | 10.0 | ug/L | 60.000 | | 104 | 54-120 | | |
| Phenol | 58.5 | 10.0 | ug/L | 60.000 | | 98 | 5-112 | | |
| Pyrene | 60.9 | 10.0 | ug/L | 60.000 | | 101 | 52-115 | | |
| 1,2-Diphenylhydrazine | 61.4 | 10.0 | ug/L | 60.000 | | 102 | 50-110 | | |
| *Surrogate: 2-Fluorophenol* | *67.2* | | *ug/L* | *75.000* | | *90* | *21-100* | | |
| *Surrogate: Phenol-d5* | *70.3* | | *ug/L* | *75.000* | | *94* | *10-94* | | |
| *Surrogate: Nitrobenzene-d5* | *46.1* | | *ug/L* | *50.000* | | *92* | *35-114* | | |
| *Surrogate: 2-Fluorobiphenyl* | *47.4* | | *ug/L* | *50.000* | | *95* | *43-116* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *75.0* | | *ug/L* | *75.000* | | *100* | *10-123* | | |
| *Surrogate: p-Terphenyl-d14* | *45.0* | | *ug/L* | *50.000* | | *90* | *33-141* | | |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | **Reported:** |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | | |
| **LCS Dup (L302139-BSD1)** | | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| 1,2,4-Trichlorobenzene | 32.7 | | 10.0 | ug/L | 60.000 | | 55 | 44-142 | 22* | 20 |
| 1,2-Dichlorobenzene | 31.4 | | 10.0 | ug/L | 60.000 | | 52 | 32-129 | 14 | 20 |
| 1,3-Dichlorobenzene | 26.6 | | 10.0 | ug/L | 60.000 | | 44 | 1-172 | 19 | 20 |
| 1,4-Dichlorobenzene | 28.5 | | 10.0 | ug/L | 60.000 | | 47 | 20-124 | 16 | 20 |
| 2,4,6-Trichlorophenol | 57.0 | | 10.0 | ug/L | 60.000 | | 95 | 37-144 | 7 | 20 |
| 2,4-Dichlorophenol | 55.6 | | 10.0 | ug/L | 60.000 | | 93 | 39-135 | 5 | 20 |
| 2,4-Dimethylphenol | 51.1 | | 10.0 | ug/L | 60.000 | | 85 | 32-119 | 3 | 20 |
| 2,4-Dinitrophenol | 36.8 | J | 50.0 | ug/L | 60.000 | | 61 | 1-191 | 10 | 20 |
| 2,4-Dinitrotoluene | 56.5 | | 10.0 | ug/L | 60.000 | | 94 | 39-139 | 14 | 20 |
| 2,6-Dinitrotoluene | 56.4 | | 10.0 | ug/L | 60.000 | | 94 | 50-158 | 12 | 20 |
| 2-Chloronaphthalene | 42.6 | | 10.0 | ug/L | 60.000 | | 71* | 80-118 | 28* | 20 |
| 2-Chlorophenol | 55.2 | | 10.0 | ug/L | 60.000 | | 92 | 23-134 | 4 | 20 |
| 2-Nitrophenol | 55.6 | | 10.0 | ug/L | 60.000 | | 93 | 29-182 | 3 | 20 |
| 3,3'-Dichlorobenzidine | 52.2 | | 50.0 | ug/L | 60.000 | | 87 | 1-262 | 24* | 20 |
| 4,6-Dinitro-2-methylphenol | 59.1 | | 25.0 | ug/L | 60.000 | | 98 | 1-181 | 16 | 20 |
| 4-Bromophenyl Phenyl Ether | 41.7 | | 10.0 | ug/L | 60.000 | | 69 | 53-127 | 38* | 20 |
| 4-Chloro-3-methylphenol | 58.3 | | 10.0 | ug/L | 60.000 | | 97 | 22-147 | 5 | 20 |
| 4-Chlorophenyl Phenyl Ether | 43.1 | | 10.0 | ug/L | 60.000 | | 72 | 25-158 | 33* | 20 |
| 3- and/or 4-Methylphenol | 56.3 | | 10.0 | ug/L | 60.000 | | 94 | 40-110 | 6 | 20 |
| 4-Nitrophenol | 64.0 | | 25.0 | ug/L | 60.000 | | 107 | 1-132 | 3 | 20 |
| Acenaphthene | 43.7 | | 10.0 | ug/L | 60.000 | | 73 | 47-145 | 30* | 20 |
| Acenaphthylene | 48.7 | | 10.0 | ug/L | 60.000 | | 81 | 33-145 | 24* | 20 |
| Anthracene | 44.2 | | 10.0 | ug/L | 60.000 | | 74 | 27-133 | 35* | 20 |
| Benz[a]anthracene | 45.2 | | 10.0 | ug/L | 60.000 | | 75 | 33-143 | 37* | 20 |
| Benzidine | 27.7 | J | 50.0 | ug/L | 60.000 | | 46 | 1-180 | 12 | 20 |
| Benzo[a] pyrene | 44.4 | | 10.0 | ug/L | 60.000 | | 74 | 50-140 | 41* | 20 |
| Benzo[b] fluoranthene | 45.4 | | 10.0 | ug/L | 60.000 | | 76 | 50-140 | 40* | 20 |
| Benzo[g,h,i] perylene | 45.7 | | 10.0 | ug/L | 60.000 | | 76 | 50-140 | 41* | 20 |
| Benzo[k] fluoranthene | 44.4 | | 10.0 | ug/L | 60.000 | | 74 | 50-140 | 37* | 20 |
| Bis(2-chloroethoxy) methane | 54.2 | | 10.0 | ug/L | 60.000 | | 90 | 33-184 | 4 | 20 |
| Bis(2-chloroethyl) ether | 51.7 | | 10.0 | ug/L | 60.000 | | 86 | 12-158 | 5 | 20 |
| Bis(2-chloroisopropyl) ether | 51.2 | | 10.0 | ug/L | 60.000 | | 85 | 36-166 | 3 | 20 |
| Bis(2-ethylhexyl) phthalate | 50.2 | | 10.0 | ug/L | 60.000 | | 84 | 8-158 | 37* | 20 |
| Butyl Benzyl Phthalate | 46.1 | | 10.0 | ug/L | 60.000 | | 77 | 1-152 | 35* | 20 |
| Chrysene | 46.2 | | 10.0 | ug/L | 60.000 | | 77 | 17-168 | 36* | 20 |
| Dibenz[a,h]anthracene | 45.2 | | 10.0 | ug/L | 60.000 | | 75 | 1-227 | 40* | 20 |

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| | | |
|---|---|---|
| WC-Hanford, Inc. | Project: RC-138 | |
| 2620 Fermi Avenue | Project Number: K4069 | Reported: |
| Richland WA, 99354 | Project Manager: Joan Kessner | 03/11/2013 18:08 |

## Semivolatile Organic Compounds by EPA 625 - Quality Control

## Lionville Laboratory

| Analyte | Result and Qualifiers | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| **Batch L302139 - EPA 625 Cont.** | | | | | | | | | |
| **LCS Dup (L302139-BSD1)** | | | Prepared: 02/19/2013 Analyzed: 02/21/2013 | | | | | | |
| Diethyl Phthalate | 51.3 | 10.0 | ug/L | 60.000 | | 85 | 1-114 | 5 | 20 |
| Dimethyl Phthalate | 50.3 | 10.0 | ug/L | 60.000 | | 84 | 50-140 | 2 | 40 |
| Di-n-butyl Phthalate | 42.7 | 10.0 | ug/L | 60.000 | | 71 | 40-150 | 32 | 40 |
| Di-n-octyl Phthalate | 47.1 | 10.0 | ug/L | 60.000 | | 79 | 50-150 | 44* | 40 |
| Fluoranthene | 44.0 | 10.0 | ug/L | 60.000 | | 73 | 26-137 | 34* | 20 |
| Fluorene | 44.4 | 10.0 | ug/L | 60.000 | | 74 | 59-121 | 30* | 20 |
| Hexachlorobenzene | 41.3 | 10.0 | ug/L | 60.000 | | 69 | 1-152 | 38* | 20 |
| Hexachlorobutadiene | 25.9 | 10.0 | ug/L | 60.000 | | 43 | 24-116 | 35* | 20 |
| Hexachlorocyclopentadiene | 28.2 | 10.0 | ug/L | 60.000 | | 47 | 1-180 | 28* | 20 |
| Hexachloroethane | 17.6 | 10.0 | ug/L | 60.000 | | 29* | 40-113 | 40* | 20 |
| Indeno[1,2,3-cd]pyrene | 45.7 | 10.0 | ug/L | 60.000 | | 76 | 1-171 | 41* | 20 |
| Isophorone | 52.4 | 10.0 | ug/L | 60.000 | | 87 | 21-196 | 4 | 20 |
| Naphthalene | 46.8 | 10.0 | ug/L | 60.000 | | 78 | 21-133 | 13 | 20 |
| Nitrobenzene | 52.5 | 10.0 | ug/L | 60.000 | | 88 | 35-180 | 3 | 20 |
| N-Nitrosodimethylamine | 53.0 | 10.0 | ug/L | 60.000 | | 88 | 1-180 | 0.08 | 20 |
| N-Nitrosodi-n-propylamine | 56.2 | 10.0 | ug/L | 60.000 | | 94 | 40-120 | 3 | 20 |
| N-Nitrosodiphenylamine | 47.4 | 10.0 | ug/L | 60.000 | | 79 | 1-180 | 23* | 20 |
| Pentachlorophenol | 53.9 | 25.0 | ug/L | 60.000 | | 90 | 14-176 | 27* | 20 |
| Phenanthrene | 44.4 | 10.0 | ug/L | 60.000 | | 74 | 54-120 | 33* | 20 |
| Phenol | 56.3 | 10.0 | ug/L | 60.000 | | 94 | 5-112 | 4 | 20 |
| Pyrene | 43.0 | 10.0 | ug/L | 60.000 | | 72 | 52-115 | 35* | 20 |
| 1,2-Diphenylhydrazine | 45.6 | 10.0 | ug/L | 60.000 | | 76 | 50-110 | 30* | 20 |
| *Surrogate: 2-Fluorophenol* | *67.4* | | *ug/L* | *75.000* | | *90* | *21-100* | | |
| *Surrogate: Phenol-d5* | *71.5* | | *ug/L* | *75.000* | | *95** | *10-94* | | |
| *Surrogate: Nitrobenzene-d5* | *46.8* | | *ug/L* | *50.000* | | *94* | *35-114* | | |
| *Surrogate: 2-Fluorobiphenyl* | *45.0* | | *ug/L* | *50.000* | | *90* | *43-116* | | |
| *Surrogate: 2,4,6-Tribromophenol* | *72.6* | | *ug/L* | *75.000* | | *97* | *10-123* | | |
| *Surrogate: p-Terphenyl-d14* | *41.8* | | *ug/L* | *50.000* | | *84* | *33-141* | | |

# PREPARATION BENCH SHEET

L302139

**Lionville Laboratory**

**Printed: 2/21/2013 1:11:40PM**

00000045

**Matrix: Water**

**Prepared using: Extraction - EPA 625 Cont.**

**Surrogate used: 1201561**

| Lab Number | Analysis | Prepared | Initial (mL) | Final (mL) | Spike ID | Source ID | ul Spike | ul Surrogate | Client | Extraction Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 1302036-01 | 625 SVOC | 02/19/2013 13:24 | 500 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1302036-02 | 625 SVOC | 02/19/2013 13:24 | 500 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1302036-03 | 625 SVOC | 02/19/2013 13:24 | 500 | 1 | | | | 500 | WC-Hanford, Inc. | |
| 1302036-04 | 625 SVOC | 02/19/2013 13:24 | 500 | 1 | | | | 500 | WC-Hanford, Inc. | |
| L302139-BLK1 | QC | 02/19/2013 13:24 | 1000 | 1 | | | | 500 | | |
| L302139-BS1 | QC | 02/19/2013 13:24 | 1000 | 1 | 1300019 | | 600 | 500 | | |
| L302139-BSD1 | QC | 02/19/2013 13:24 | 1000 | 1 | 1300019 | | 600 | 500 | | |

Extracts Relinquished By 2/21/13 1311 Date

Extracts Received By 2/21/13 1315 Date