# APPENDIX I
## LNAPL Baildown Field Procedures, Methodology, Analysis

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# APPENDIX I
# LNAPL BAIL-DOWN FIELD PROCEDURES, METHODOLOGY, ANALYSIS

## 1.0 LNAPL BAIL-DOWN TESTING AND ANALYSIS

Bail-down tests in unconfined aquifers are commonly evaluated using the Bouwer and Rice methodology for groundwater slug tests (Bouwer and Rice 1976 and 1989). The Bouwer and Rice slug test analytical solution has been modified to estimate LNAPL transmissivity following one or more slug withdrawals (Huntley 2000; Kirkman 2012).

Based on this methodology, the purpose of the testing was to:

- Empirically and quantitatively evaluate the transmissivity of LNAPL in the geologic formation, and
- Assess the potential recoverability of LNAPL.

LNAPL transmissivity is a measure of the potential flux of LNAPL per unit drawdown, or the volume of LNAPL that travelling through a unit width of an aquifer per unit time per unit drawdown (units of length squared per time).

## 2.0 BAIL-DOWN TEST METHODOLOGY

### 2.1. Field Methods

The bail-down test was conducted by removing LNAPL from the test wells and measuring and recording the LNAPL recovery and associated groundwater response in the monitoring well following removal of the LNAPL. LNAPL bail-down tests were performed in four monitoring wells that had approximately one foot or more of LNAPL (TL-MW-2, TL-MW-4, TL-MW-5A and TL-MW-6). Three of these wells had marginal LNAPL thicknesses to conduct bail-down tests (LNAPL thicknesses in TL-MW-4, TL-MW-5A and TL-MW-6 ranged from 0.99 to 1.08 feet). Both air-LNAPL and LNAPL-water interfaces were measured following LNAPL removal. The bail-down field procedures were presented in GeoEngineers' "Final Work Plan for Supplemental Investigation, R.G. Haley International Site, Bellingham, Washington" (GeoEngineers 2012) and are based on the methodology of Lundy (2000). Measurements continued periodically until at least 80 percent of the original recorded LNAPL thickness recovered or for a maximum of 165 hours following initial removal of the LNAPL.

### 2.2. Analytical Methods

The Bouwer and Rice slug test method was developed to estimate hydraulic conductivity of aquifer materials from partially or fully-penetrating wells in unconfined aquifers (Bouwer and Rice 1976 and 1989). Huntley (2000) and Kirkman (2012) have derived LNAPL bail-down test analytical solutions by modifying the Bouwer and Rice method for estimating hydraulic conductivity. The Huntley method assumes the change in LNAPL thickness following slug withdrawal is due to a change in elevation of the air-LNAPL table, and that LNAPL withdrawal has a negligible effect on the groundwater potentiometric surface. The Kirkman method does not assume the groundwater potentiometric surface remains constant, and the ratio of the LNAPL drawdown to the LNAPL thickness is unique to each dataset and does not rely on pre-determined boundary conditions.

## 3.0 BAIL-DOWN TEST RESULTS

LNAPL bail-down tests were performed in monitoring wells TL-MW-2, TL-MW-4, TL-MW-5A, and TL-MW-6 to estimate the LNAPL transmissivity ($T_n$). Data from TL-MW-4, TL-MW-5A, and TL-MW-6 are not considered usable for transmissivity estimates because the LNAPL drawdown and LNAPL thickness changes were too small to allow the method of analysis to be used effectively for the purpose intended. For example, the LNAPL thickness recovered to less than 0.5 feet over the duration of the test which ranged from 14 hours to over six days.

Several factors could contribute to the LNAPL drawdown and thickness being inconsistent with theoretical response of LNAPL in a small diameter monitoring well after bail-down. Those factors include: fluctuating groundwater elevations due to tidal effects, insufficient early measurement data, insufficient LNAPL, and LNAPL transmissivities being too low to measure by the methods of analysis under tidally fluctuating conditions.

LNAPL bail down test data obtained from TL-MW-2 was evaluated using the methods derived by Huntley (2000) and Kirkman (2012). Air/LNAPL and LNAPL/groundwater interface measurements from the June 2012 bail-down test are shown in Figure I-1 which shows the observed LNAPL elevation drawdown data. This graph Indicates the potentiometric surface at 18 to 165 minutes elapsed time was stable and therefore the data for this well were deemed to be usable for the methods of analysis. A plot of LNAPL drawdown versus elapsed time is provided as Figure I-2 (used for the Huntley analysis). Figure I-3 is the plot of LNAPL drawdown versus thickness (used for the Kirkman analysis).

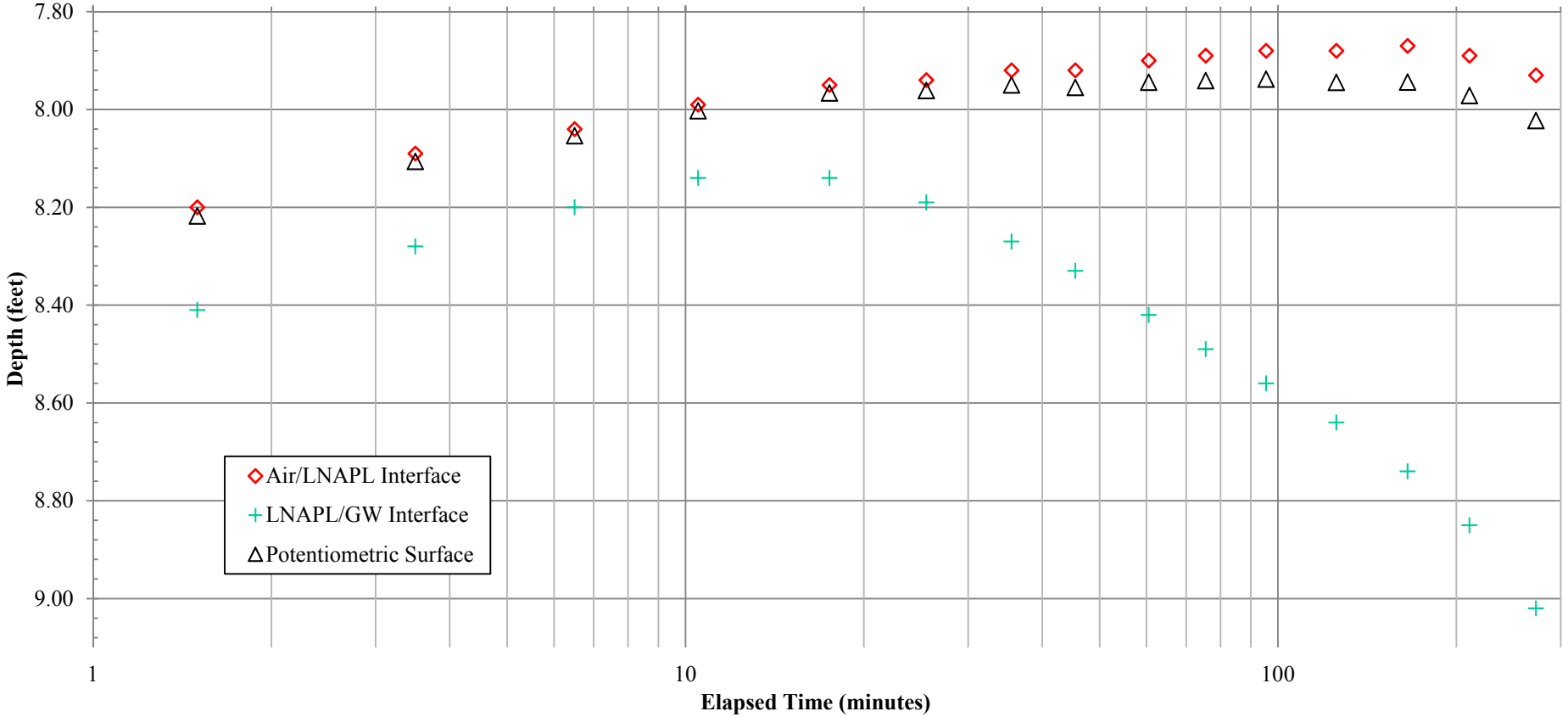
The estimated transmissivity values are presented below.

| Monitoring Well TL-MW-2 | Estimated LNAPL Transmissivity (Tn) |
|---|---|
| Huntley Method | 2.96 $ft^2$ per day |
| Kirkman Method | 2.11 $ft^2$ per day |

Note: LNAPL specific gravity assumed 0.915 (Appendix J, 2012 laboratory report from PTS Laboratories).

Transmissivity estimates from TL-MW-2 appear to be reasonable considering conditions at the Site. Monitoring well TL-MW-2 is screened within a heterogeneous fill material consisting primarily of sand, silt, and non-native materials including wood, brick and coal. As a result, the estimated transmissivity may be limited to the immediate area surrounding monitoring well TL-MW-2. This conclusion is corroborated by the highly variable LNAPL thickness measurements between monitoring wells separated by small lateral distances.

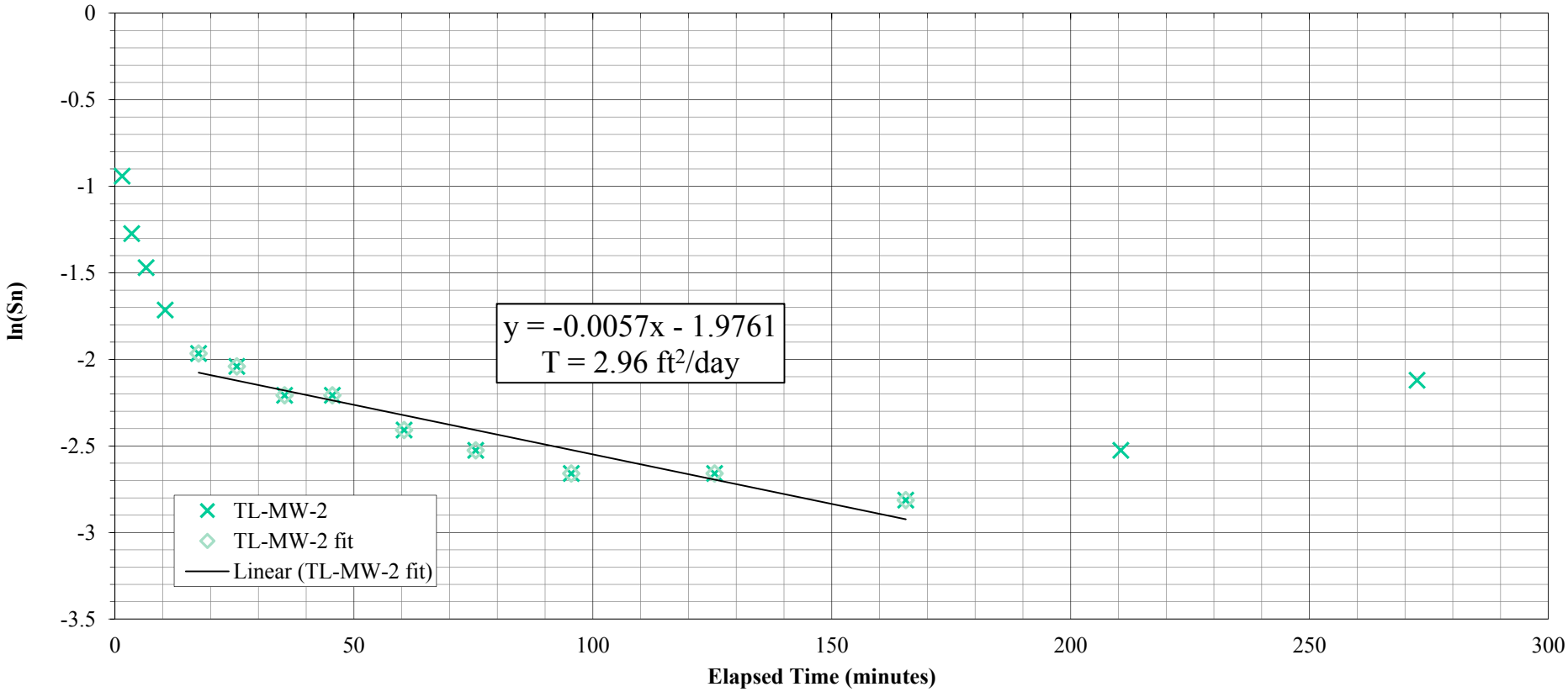
# LNAPL Bail-Down Test Data
# TL-MW-2, June 2012




| LNAPL Bail-Down Test Data<br>TL-MW-2 | |
|---|---|
| R.G. Haley Site<br>Bellingham, Washington | |
| GeoEngineers | Figure I-1 |

# TL-MW-2

Huntley Method, June 2012




**LNAPL Bail-Down Test at TL-MW-2**

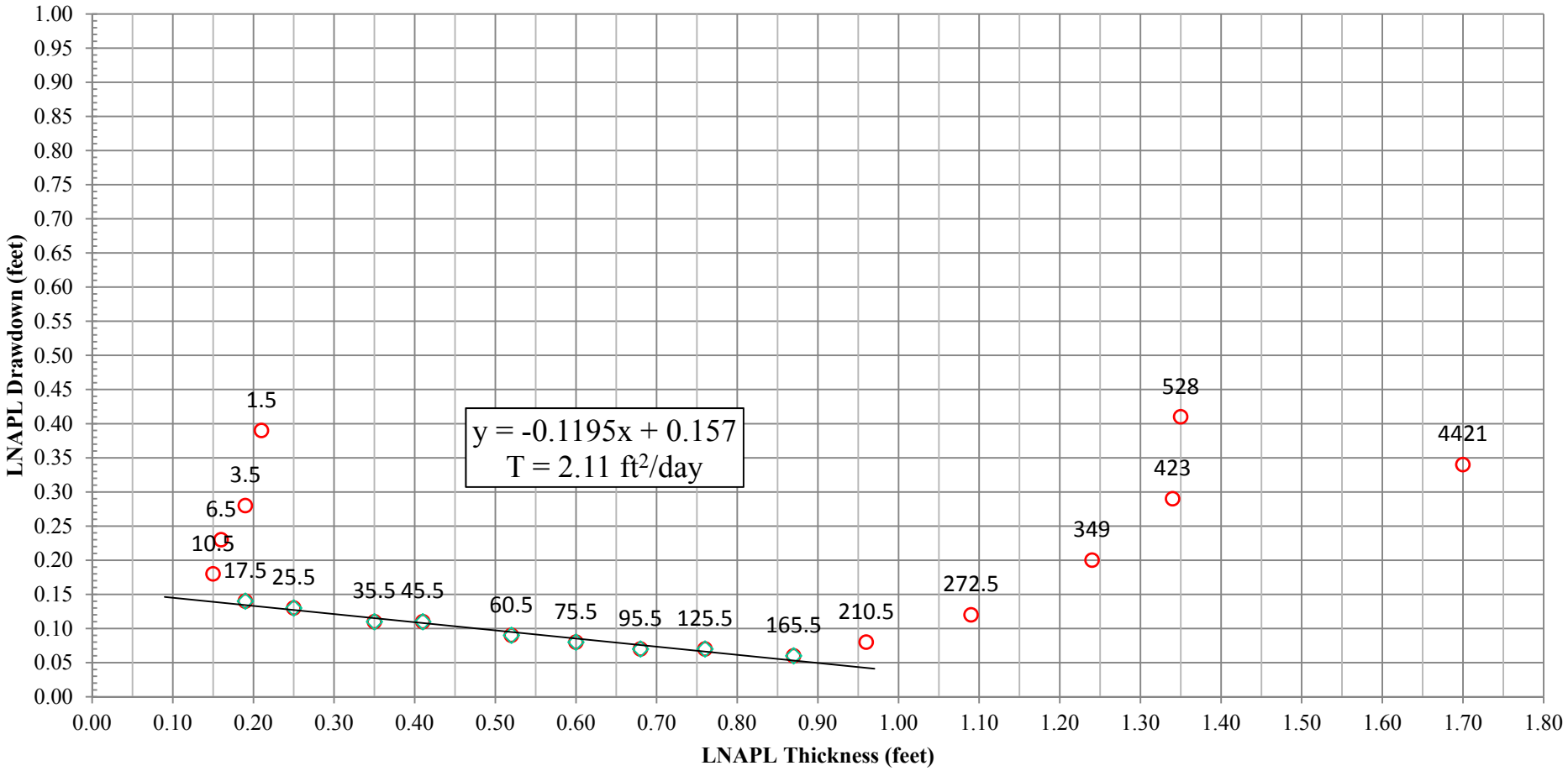
R.G. Haley Site
Bellingham, Washington

GeoEngineers

Figure I-2

# TL-MW-2

Kirkman Method, June 2012




Notes:

1. Labels indicate elapsed time in minutes.

**LNAPL Bail-Down Test at TL-MW-2**

R.G. Haley Site
Bellingham, Washington

GeoEngineers

Figure I-3

# APPENDIX J
## LNAPL and Petrophysical Testing and UV Photograph of Core Samples

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# APPENDIX J
# LNAPL AND PETROPHYSICAL TESTING

This appendix contains the following supporting information related to LNAPL testing and UV photography of core samples:

1. Data obtained during the 2012 Supplemental Investigation:

- Table J-1 Summary of Core UV Photography Interpretation and Free Product Mobility (FPM) Testing.
- Figure J-1: TL-MW-14 Core UV Photographs (June 2012) from 7.5 to 17.5 feet bgs interpreted with soil descriptions, porosity, and findings from FPM testing.
- Figure J-2: TL-MW-15 Core UV Photographs (June 2012) from 6.0 to 13.3 feet bgs interpreted with soil descriptions and findings from Free Product Mobility (FPM) testing.
- Figure J-3: PTS Corephoto information sheet.
- Exhibit J-1: PTS Laboratories analytical report for Stepped Free Product Mobility: Initial and Residual Saturations, TL-MW-14-7-7.5 and TL-MW-14-8-8.5; Initial and Residual Saturations, TL-MW-15-6-13.5 and TL-MW-14-10-10.5; Initial and Residual Saturations, TL-MW-14-11-11.5, and TL-MW-2 LNAPL sample obtained June 20, 2012 and analyzed for temperature, specific gravity, density and viscosity.

2. Oil and LNAPL Sample Chemical Analytical Data Reports and Chromatograms Obtained During Prior Studies:

- Exhibit J-2: LNAPL Chromatograms and Chemical Analytical Data
    - Petroleum hydrocarbon chromatograms for Haley UST oil samples obtained in 2000 and 2004 and chromatogram for carrier oil (P9 oi) standard.
    - Chemical analytical report (Manchester Laboratory) and chromatogram for UST oil sample obtained by Ecology in 2004. Ecology obtained this oil sample from the Haley UST in June 2004. The sample was analyzed for petroleum hydrocarbons/hydrocarbon identification. The laboratory reported that the "sample contains a highly aromatic #2 fuel oil range petroleum product along with what may be pentachlorophenol."
    - Chemical analytical report (Analytical Resources Inc.) for sample "Tank" of oil from Haley UST obtained February 10, 2000 by Douglas Management and analyzed for pentachlorophenol using GC/MS Methods.
    - Chemical analytical report (Pace Analytical) for sample "Oil" at beach oil seep obtained April, 2000 by Ecology and analyzed for dioxins/furans by EPA Method 8290 and chlorinated phenols by Draft EPA Method 8085. The water and the oil portions of the sample were separated before analysis.
    - Chemical analytical report (NCA) for UST oil Sample ID BWT-TS-01 and TL-MW-2 LNAPL Sample. GeoEngineers obtained oil sample BWT-TS-01 from the UST in the wood treating area of the Haley property on March 3, 2000. The samples were analyzed for SVOCs by EPA Method 8270.
    - Chemical analytical report (Spectra Laboratories) for TL-MW-4 LNAPL sample obtained in May 2000 analyzed for API gravity, specific gravity and kinematic viscosity.

- Chemical analytical report (Sound Analytical Services Inc.) for TL-MW-4 LNAPL sample obtained May 3, 2000 and analyzed for HVOCs by EPA method 8260B, SVOCs by EPA Method 8270, Metals by EPA Method 6020 and TCLP Metals by EPA Method 6010, flash point by EPA Method 1010 and pH by EPA Method 9045.
- Chemical analytical report (Quanterra) May 15, 2000 for TL-MW-3 LNAPL sample obtained April 4, 2000 and analyzed for dioxins/furans by EPA Method 8290.
- Chemical analytical report (NCA) August 26, 2004 for UST-061504 oil sample from the Haley UST in June 2004 and analyzed by Frontier Analytical Laboratory for dioxins/furans by EPA Method 8290.
- Chemical analytical report (NCA) June 10, 2005 for TL-MW-2 LNAPL sample obtained on June 26, 2005 and analyzed for NWTPH-Dx, includes petroleum hydrocarbon chromatogram.

# Table J-1

## Summary of Core UV Photography Interpretation and Free Product Mobility (FPM) Testing

**R.G. Haley Site**

**Bellingham, Washington**

| Exploration Identification | Sample Depth for Petrophysical Testing (feet bgs) | Soil Description | Visual Sheen Observations | Fluorescence Comments | Chemical Analytical Results | FPM Results as Reported by PTS (See Lab Report) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | PTS Tested Depth | Total Porosity | Initial NAPL Saturation | Final NAPL Saturation at 1,000 rpm (revolutions per minute) | PTS Observation at End of Test (1,000 rpm) |
| TL-MW-14 | 7.75 | Poorly graded gravel with sand and silt. Fine gravel, f-m sand. Dark brown. | MS, metallic to HS, rainbow. | Completely flaired white except for voids. | Not Tested | 7.75 (spun in air) | 38.7 | 8.9 | 8.1 | Dark brown LNAPL produced. Produced water cloudy. (NAPL not produced at 250 or 500 RPM) |
| TL-MW-14 | 8.2 | Poorly graded gravel with sand and silt. Fine gravel, f-m sand. Dark brown. | HS, rainbow. | Splotchy white fluorescence, fairly pervasive. Some rounder clasts do not fluoresce. Possible textural changes related to increased fluorescence but difficult to evaluate. Higher fluorescence seems to coincide with discolored (browner) areas on core suggesting preferential migration or sorption. | Not Tested | 8.2 (spun in air) | 41.3 | 3.1 | 2.9 | Trace LNAPL produced. Produced water cloudy. [NAPL not produced at 250 or 500 RPM] |
| TL-MW-14 | 10.2 | Silty sand with gravel. F-m Sand, f-c gravel, occ. Wood fragments. | HS, rainbow. Staining and petroleum-like odor. | Fluorescence more pervasive with higher intensity areas. Shell or wood fragment near 10.1 has less fluorescence. Possible discoloration coinciding with higher intensity | Not Tested | 10.2 (spun under water) | 37.8 | 9.0 | 9.0 | No visible NAPL produced. |
| TL-MW-14 | 11.65 | Poorly graded sand with gravel and silt. F-m sand, f-c gravel. Dark brown to black, occasional fresh brown wood fragments and white shell fragments. | HS, rainbow. Staining and petroleum-like odor. | Speckled fluorescence, more so on edge of core. | TPH-D = 17,770 mg/kg | 11.6 (spun under water) | 40.0 | 13.9 | 13.9 | No visible NAPL produced. |
| TL-MW-15 | 7.72 | Wood fragments | Stained, petroleum-like odor. HS, rainbow. | Fluorescence at top is suspected slough. At 7.5 - 7.7, fluorescence appears to be limited to wood fragments. Possible intergranular impacts starting at around 7.7. | Not Tested | Not Tested | Not Tested | Not Tested | Not Tested | Not Tested |
| TL-MW-15 | 9.55 | Wood fragments, dark brown. | Stained and petroleum-like odor. MS, metallic to HS, rainbow. | Fluorescence is pervsasive. Moderate from 9.03 to 9.24 and heavier from 9.25 to end. Clast at 9.38, no fluorescence. Overall less fluorescence associated with larger wood fragments. Higher fluorescence near edge of movement/smearing. Highest fluorescence between 9.34 and 9.8. | Not Tested | 9.6 (spun under water) | 48.2 | 15.9 | 15.9 | No visible NAPL produced. |
| TL-MW-15 | 10.95 | Wood fragments, dark brown. | Stained and petroleum-like odor. HS, rainbow. | Moderate to high fluorescence is pervasive. Perhaps less fluorescence in coarser fragments. Right side of core with less fluorescence may represent settling. | TPH-D = 6,100 mg/kg | 10.95 (spun under water) | 42.2 | 4.0 | 4.0 | No visible NAPL produced. |
| TL-MW-15 | 11.55 | Poorly graded sand with silt. m sand, occ shell and brown wood fragments. | Staining and petroleum-like odor. HS, rainbow to SS. | Pervasive but somewhat splotchy fluorescence except for coarser particles (no fluorescence). | Not Tested | 11.6 (spun under water) | 40 | 13.9 | 13.9 | No visible NAPL produced. |
| TL-MW-15 | 12.1 | Poorly graded sand. M sand. Occ shell and wood fragments. | SS | Only a few specs of fluorescence. Break in core or discontinuity at about 13.9. | Not Tested | Not Tested | Not Tested | Not Tested | Not Tested | Not Tested |

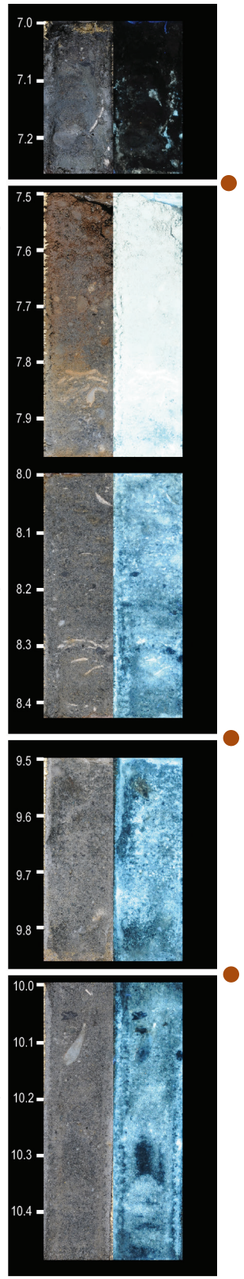
# TL—MW—14

| | |
|---|---|
| **Description** | Poorly graded gravel with sand and silt. Moderate to heavy sheen. |
| **Total Porosity** | 38.7% |
| **Initial NAPL Saturation** | 8.9% |
| **Final NAPL Saturation at 1,000 RPM** | 8.1% |
| **PTS Observation at End of Test (1,000rpm)** | Dark brown LNAPL produced. Produced water cloudy. [NAPL not produced at 250 or 500 RPM] |

| | |
|---|---|
| **Description** | Poorly graded gravel with sand and silt. Heavy sheen. |
| **Total Porosity** | 41.3% |
| **Initial NAPL Saturation** | 3.1% |
| **Final NAPL Saturation at 1,000 RPM** | 2.9% |
| **PTS Observation at End of Test (1,000rpm)** | Trace LNAPL produced. Produced water cloudy. [NAPL not produced at 250 or 500 RPM] |

| | |
|---|---|
| **Description** | Silty sand with gravel, occasional wood fragments. Heavy sheen. |
| **Total Porosity** | 37.8% |
| **Initial NAPL Saturation** | 9.0% |
| **Final NAPL Saturation at 1,000 RPM** | 9.0% |
| **PTS Observation at End of Test (1,000rpm)** | No visible NAPL produced. |

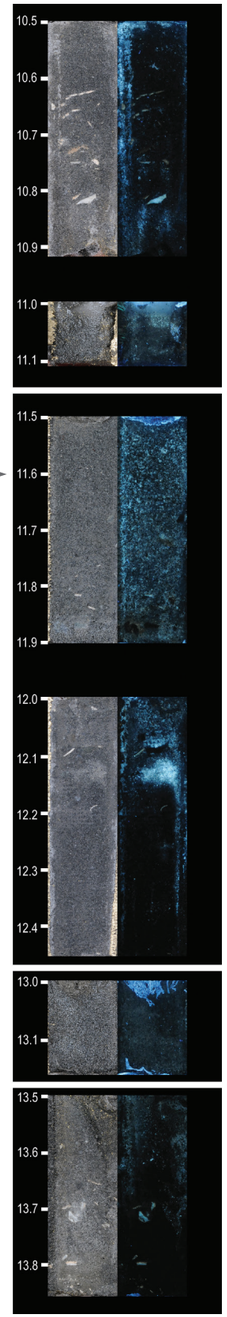
**7.0 ft. - 10.5 ft.**




Break in core

| | |
|---|---|
| **Description** | Poorly graded sand with gravel and silt, occasional fresh brown wood fragments and white shell fragments. Heavy sheen. |
| **Total Porosity** | 40% |
| **Initial NAPL Saturation** | 13.9% |
| **Final NAPL Saturation at 1,000 RPM** | 13.9% |
| **PTS Observation at End of Test (1,000rpm)** | No visible NAPL produced. |

**10.5 ft. - 13.9 ft.**




**14.5 ft. - 17.5 ft.**

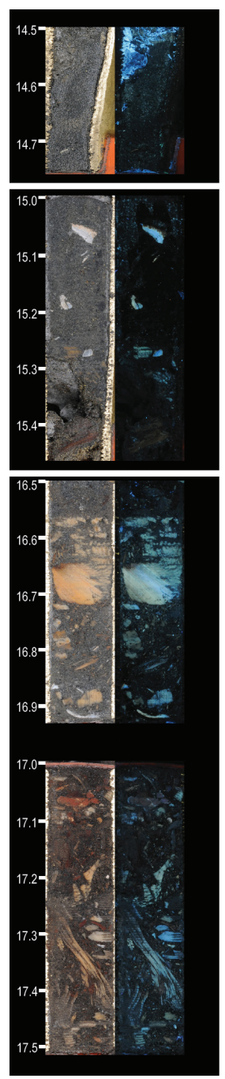
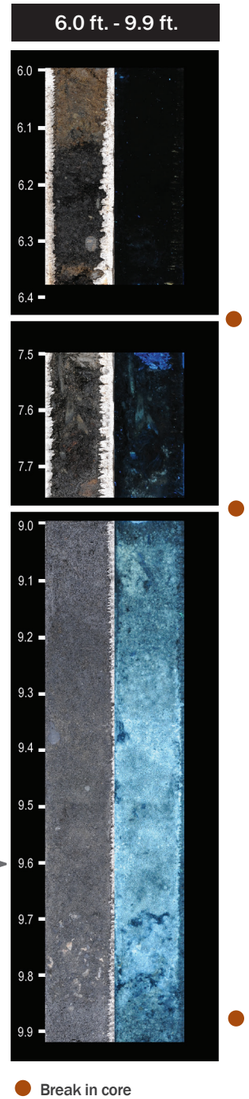


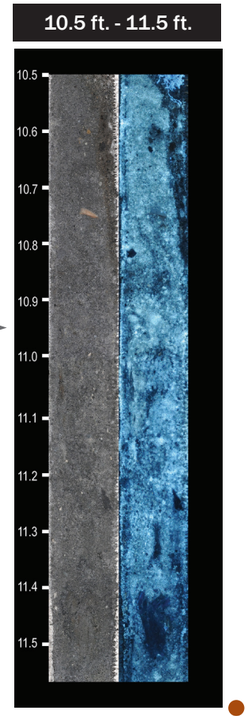

**Figure J-1**

# TL—MW—15

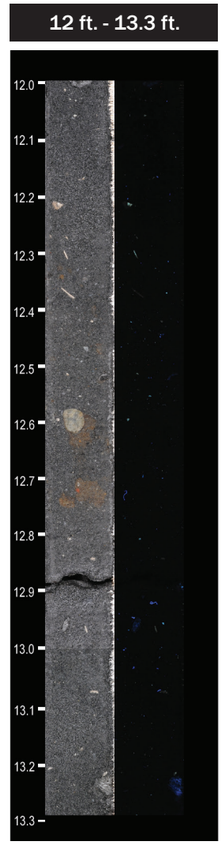



| Description | Wood fragments. Heavy sheen. |
|---|---|
| Total Porosity | 42.2% |
| Initial NAPL Saturation | 4.0% |
| Final NAPL Saturation at 1,000 RPM | 4.0% |
| PTS Observation at End of Test (1,000rpm) | No visible NAPL produced. |

| Description | Wood fragments. Moderate to heavy sheen. |
|---|---|
| Total Porosity | 48.2% |
| Initial NAPL Saturation | 15.9% |
| Final NAPL Saturation at 1,000 RPM | 15.9% |
| PTS Observation at End of Test (1,000rpm) | No visible NAPL produced. |




| Description | Poorly graded sand with silt, occasional shell and brown wood fragments. Heavy sheen. |
|---|---|
| Total Porosity | 40% |
| Initial NAPL Saturation | 13.9% |
| Final NAPL Saturation at 1,000 RPM | 13.9% |
| PTS Observation at End of Test (1,000rpm) | No visible NAPL produced. |




Break in core

**Figure J-2**

# Core Photography



## DESCRIPTION

Core photographs are high-detail engineering documents that provide ease of study and a permanent record of the subsurface. Optional ultraviolet (UV) photographs record free-product (NAPL) fluorescence. Frozen core is cut open using a horizontal bandsaw with a diamond-segmented blade. After cutting, the slabbed core is cleaned and prepared for photography. Most core is slabbed into 1/4-3/4 sections providing enough bulk rock for lithologic description and sufficient material for the analytical work.

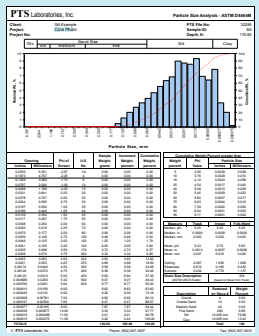
There are two common formats for displaying core. The first is a group setting with up to 15 feet of core photographed together and displayed on one 8"x10" sheet. Full-scale format is illustrated in foot-by-foot laminated strips. Custom formats are available.

Each photograph has a universal gray scale and color bar as color comparator. Ultraviolet light photos are color-corrected using oil standards that are photographed with each project. All printing is performed onsite. Extreme care is made internally to color match the core with the prints. Onsite printing allows PTS Laboratories to meet quick turnaround times. PTS has been providing secure and confidential in-house core photography and printing since 1984. Permanent archiving for all photographic negatives is included.

## CORE PHOTOGRAPHY USES

- **Visual correlation to index properties and field logs**
- **Site cross section correlation**
- **Monitoring well installation**
- **Litigation support**
- **Future drilling investigations**
- **Regulatory agency requirements**
- **Ease of study**
- **Permanent records**

Core images can also be presented electronically on CD-ROM that includes thumbnail, 1x, 2x, and 4x magnifications with lithologic description.



K = 4.53E-07 cm/s

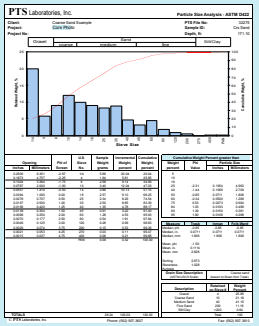
n = 0.47

Mc = 25.3%

BD = 1.78 gm/cc

Silt, medium gray (N 5). Sand-6%, silt-76%, clay-18%. Subangular to rounded clay ripups (?) to 4cm in diameter throughout. Subangular to subrounded claystone or caliche clasts to 5mm in diameter, Very faint laminae present.

Contact between aquifer and aquatard at 170.9 ft BGS



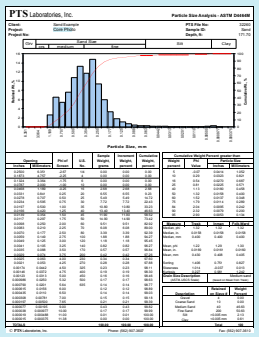
K = 3.25E-03 cm/s

n = 0.35

Mc = 17.2%

BD = 1.65 gm/cc

Silty sandy cobble conglomerate, grayish brown (5 YR 3/2) and light brown (5 YR 5/6). Gravel-60%, sand-20%, silt-5%, clay-15%. Sand grains angular to subangular quartz, feldspar, and mafics. Subangular to subrounded rock cobbles to 50mm in diameter.



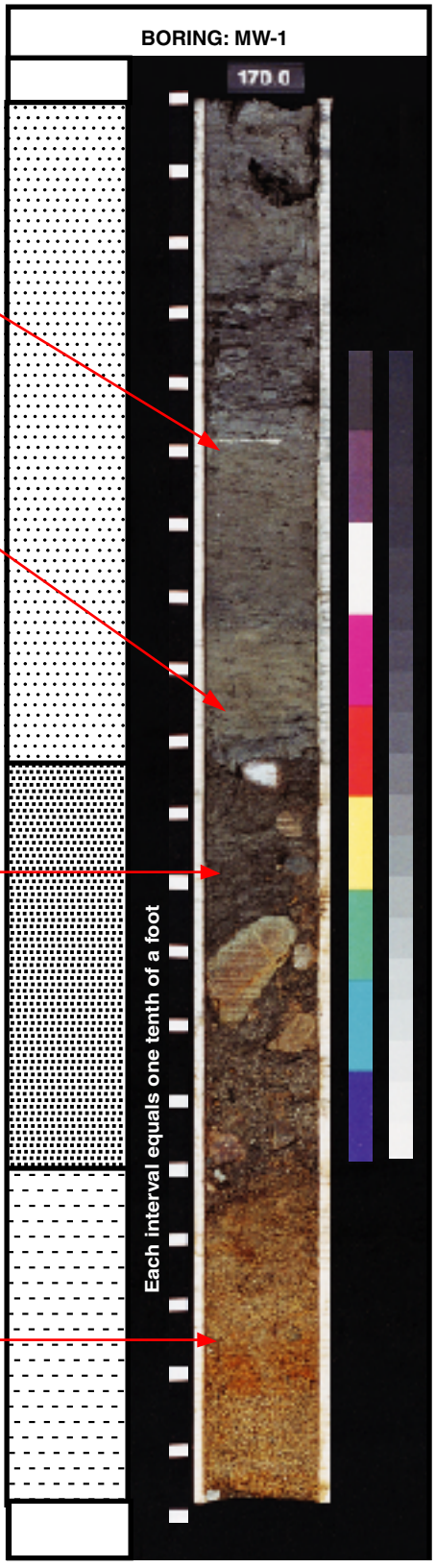
K = 3.25E-05 cm/s

n = 0.30

Mc = 22.4%

BD = 1.68 gm/cc

Moderately sorted, medium to coarse sand, moderate yellowish brown (10 YR 5/4). Sand grains angular to subrounded quartz with minor feldspar and mafics. Faint bedding and reddish brown staining.




PTS Laboratories, Inc. • 8100 Secura Way • Santa Fe Springs, CA 90670 • Telephone: (562) 907-3607 • FAX: (562) 907-3610

PTS GeoLabs, Inc. • 4342 West 12th Street • Houston, Texas 77055 • Telephone: (713) 680-9467 • FAX: (713) 680-0763

# EXHIBIT J-1
## PTS Lab Report, June 2012

PTS Laboratories, Inc.

8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

October 19, 2012

Carla E. Brock
GeoEngineers, Inc.
600 Stewart Street, Suite 1700
Seattle, WA 98101

Re: PTS File No: 42467
Physical Properties Data
R.G. Haley International Site; 0356-114-06 T10

Dear Ms. Brock:

Please find enclosed report of Physical Properties data from analysis conducted on cores received from your R.G. Haley International Site; 0356-114-06 T10 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. Electronic versions of the core images and physical properties report have been uploaded to PTS Laboratories website, www.ptslabs.com. The cores remain in frozen storage and will be held indefinitely. Please note that core storage is currently being billed.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Rachel Spitz at (562) 347-2504.

Sincerely,
PTS Laboratories

for Rachel

Michael Mark Brady, P.G.
District Manager

Encl.

**PTS** Labc ‘ories

**Project Name:** R.G. Haley International Site
**Project Number:** 0356-114-06 T10

**PTS File No:** 42467
**Client:** GeoEngineers, Inc.

## TEST PROGRAM - 20120912

| CORE ID | Depth ft. | Core Recovery ft. | Slab and Core Photo | A/W Drng. Capillarity Pkg. | *Free Product Mobility | *Free Product Mobility Under Water | Viscosity/ Density at 70°F | Water/NAPL Relative Permeability | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **Method:** | | **Plugs:** | 1/4:3/4 | Hor. 1" | Hor. 1.5" | Hor. 1.5" | ASTM D1481, D445 | Hor. 1.5" | Keep core frozen |
| Date Received: 20120621 | | | | | | | | | |
| TL-MW-2-062012 | N/A | N/A | | | | | X | | 240 mL LNAPL |
| Date Received: 20120629 | | | | | | | | | |
| TL-MW-15_B-6-13.5 | 6.0-6.5 | 0.35 | 1 | | | | | | A |
| TL-MW-15_B-6-13.5 | 7.5-8.0 | 0.25 | 1 | | | | | | B |
| TL-MW-15_B-6-13.5 | 9.0-10.0 | 0.90 | 1 | | | 9.6 | | | C |
| TL-MW-15_B-6-13.5 | 10.5-12.0 | 1.10 | 2 | | | 10.95 | | | D |
| TL-MW-15_B-6-13.5 | 12-13.5 | 1.30 | 2 | | | | | | E |
| Date Received: 20120713 | | | | | | | | | |
| TL-MW-14-7-7.5 | 7-7.5 | 0.25 | 1 | | 7.75 | | | | |
| TL-MW-14-7.5-8 | 7.5-8 | 0.45 | | | | | | | |
| TL-MW-14-8-8.5 | 8-8.5 | 0.40 | 1 | | 8.2 | | | | |
| TL-MW-14-9.5-10 | 9.5-10 | 0.35 | 1 | | | | | | Labeled: TL-MW-14-9.5-11 |
| TL-MW-14-10-10.5 | 10-10.5 | 0.50 | 1 | | | 10.2 | | | |
| TL-MW-14-10.5-11 | 10.5-11 | 0.40 | | | | | | | |
| TL-MW-14-11-11.5 | 11-11.5 | 0.10 | 1 | | | 11.6 | | | |
| TL-MW-14-11.5-12 | 11.5-12 | 0.40 | | | | | | | |
| TL-MW-14-12-12.5 | 12-12.5 | 0.45 | 1 | | | | | | |
| TL-MW-14-13.0-13.5 | 13-13.5 | 0.15 | 1 | | | | | | |
| TL-MW-14-13.5-14 | 13.5-14 | 0.35 | | | | | | | |
| TL-MW-14-14.5-15 | 14.5-15 | 0.25 | 1 | | | | | | |
| TL-MW-14-15-15.5 | 15-15.5 | 0.45 | 1 | | | | | | |
| TL-MW-14-16.5-17 | 16.5-17 | 0.40 | 1 | | | | | | |
| TL-MW-14-17-17.5 | 17-17.5 | 0.50 | 1 | | | | | | |

**PTS** Lab tories

**Project Name:** R.G. Haley International Site
**Project Number:** 0356-114-06 T10

**PTS File No:** 42467
**Client:** GeoEngineers, Inc.

## TEST PROGRAM - 20120912

| CORE ID | Depth ft. | Core Recovery ft. | Slab and Core Photo | A/W Drng. Capillarity Pkg. | *Free Product Mobility | *Free Product Mobility Under Water | Viscosity/ Density at 70°F | Water/NAPL Relative Permeability | Notes |
|---|---|---|---|---|---|---|---|---|---|
| Method: | | Plugs: | 1/4:3/4 | Hor. 1" | Hor. 1.5" | Hor. 1.5" | ASTM D1481, D445 | Hor. 1.5" | Keep core frozen |
| TOTALS: | 6 bottles 20 cores | 9.30 | 18 | 0 | 2 | 4 | 1 | 0 | 20 |

**Laboratory Test Program Notes**

Contaminant identification: diesel-range fuel (specifically, P-9 carrier oil), pentachlorophenol

Sample locations to be selected by GeoEngineers, Inc. personnel from core photography.

~~Modified Free Product Mobility: Apply centrifugal force at 1000xG for one hour. Submit centrifuged sample to analytical laboratory selected by GeoEngineers, Inc.~~

Typical TAT for Water/NAPL Relative Permeability 3-6 weeks.

Boring ID TL-MW-14: Top and bottom not identified. Photographed core assuming section filled with saran wrap is the top of the core.

*Free Product Mobility (Stepped): 250RPM, 500RPM, and 1000RPM.

PTS File : 42467
Client: GeoEngineers, Inc.

PTS Laboratories

# STEPPED FREE PRODUCT MOBILITY: INITIAL AND RESIDUAL SATURATIONS

(Centrifugal method: samples spun under air, stepped pressures.)

PROJECT NAME: R.G. Haley International Site
PROJECT NO: 0356-114-06 T10

| | | METHODS: | API RP 40 | | API RP 40 | | ASTM D425M, DEAN-STARK | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PORE FLUID SATURATIONS, % Pv | | | |
| | | | | | | | Initial Fluid Saturations | | After Centrifuging | |
| SAMPLE ID. | DEPTH, ft. | SAMPLE ORIENTATION (1) | DENSITY DRY BULK, g/cc | DENSITY GRAIN, g/cc | TOTAL POROSITY, %Vb | APPLIED FORCE, RPM or xG | WATER (Swi) SATURATION | NAPL (Soi) SATURATION | WATER (Srw) SATURATION | NAPL (Sor) SATURATION |
| TL-MW-14-7-7.5 | 7.75 | H | 1.68 | 2.73 | 38.7 | 250 RPM | 61.4 | 8.9 | 51.9 | 8.9 |
| NOTE: No visible NAPL produced. Produced water cloudy with moderate hydrocarbon odor. | | | | | | | | | | |
| | | | | | | 500 RPM | 51.9 | 8.9 | 19.0 | 8.9 |
| NOTE: No visible NAPL produced. Produced water cloudy with moderate hydrocarbon odor. | | | | | | | | | | |
| | | | | | | 1000 RPM | 19.0 | 8.9 | 13.2 | 8.1 |
| NOTE: Dark brown LNAPL produced. Produced water cloudy. | | | | | | | | | | |
| TL-MW-14-8-8.5 | 8.2 | H | 1.59 | 2.71 | 41.3 | 250 RPM | 64.1 | 3.1 | 45.5 | 3.1 |
| NOTE: No visible NAPL produced. Produced water cloudy with faint hydrocarbon odor. | | | | | | | | | | |
| | | | | | | 500 RPM | 45.5 | 3.1 | 20.1 | 3.1 |
| NOTE: No visible NAPL produced. Produced water cloudy with moderate hydrocarbon odor. | | | | | | | | | | |
| | | | | | | 1000 RPM | 20.1 | 3.1 | 12.9 | 2.9 |
| NOTE: Trace LNAPL produced. Produced water cloudy. | | | | | | | | | | |

N/A = Not Analyzed. Vb = Bulk Volume, Pv = Pore Volume. (1) H = horizontal, V = vertical
Soi = Initial NAPL Saturation as received prior to centrifuging at 1000xG, Swi = Initial Water Saturation as received prior to centrifuging at 1000xG
Sor = Residual NAPL Saturation after centrifuging at 1000xG, Srw = Residual Water Saturation after centrifuging at 1000xG
Water =0.9996 g/cc, NAPL = 0.9133 g/cc.

PTS F Jo: 42467
Client: GeoEngineers, Inc.

PTS La atories

# FREE PRODUCT MOBILITY: INITIAL AND RESIDUAL SATURATIONS

(Samples spun under water, stepped pressures.)

PROJECT NAME: R.G. Haley International Site
PROJECT NO: 0356-114-06 T10

| | | METHODS: | API RP 40 | | API RP 40 | | ASTM D425M, DEAN-STARK | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PORE FLUID SATURATIONS, % Pv | | | |
| | | | DENSITY | | | | Initial Fluid Saturations | | After Centrifuging | |
| SAMPLE ID. | DEPTH, ft. | SAMPLE ORIENTATION (1) | DRY BULK, g/cc | GRAIN, g/cc | TOTAL POROSITY, %Vb | APPLIED FORCE, RPM | WATER (Swi) SATURATION | NAPL (Soi) SATURATION | WATER (Srw) SATURATION | NAPL (Sor) SATURATION |
| TL-MW-15_B-6-13.5 | 9.6 | H | 1.39 | 2.69 | 48.2 | 250 | 23.4 | 15.9 | 31.3 | 15.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 500 | 31.3 | 15.9 | 41.1 | 15.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 1000 | 41.1 | 15.9 | 51.6 | 15.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| TL-MW-15_B-6-13.5 | 10.95 | H | 1.56 | 2.70 | 42.2 | 250 | 36.1 | 4.0 | 44.3 | 4.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 500 | 44.3 | 4.0 | 54.1 | 4.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 1000 | 54.1 | 4.0 | 65.2 | 4.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| TL-MW-14-10-10.5 | 10.2 | H | 1.68 | 2.70 | 37.8 | 250 | 37.0 | 9.0 | 41.6 | 9.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 500 | 41.6 | 9.0 | 47.1 | 9.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 1000 | 47.1 | 9.0 | 55.4 | 9.0 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |

N/A = Not Analyzed. Vb = Bulk Volume, Pv = Pore Volume. (1) H = horizontal, V = vertical, R = remold
Soi = Initial NAPL Saturation as received prior to centrifuging, Swi = Initial Water Saturation as received prior to centrifuging
Sor = Residual NAPL Saturation after centrifuging, Srw = Residual Water Saturation after centrifuging
Water =0.9996 g/cc, NAPL = 0.9133 g/cc.

# FREE PRODUCT MOBILITY: INITIAL AND RESIDUAL SATURATIONS

(Samples spun under water, stepped pressures.)

PROJECT NAME: R.G. Haley International Site
PROJECT NO: 0356-114-06 T10

| | | METHODS: | API RP 40 | | API RP 40 | | ASTM D425M, DEAN-STARK | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PORE FLUID SATURATIONS, % Pv | | | |
| | | SAMPLE | DENSITY | | TOTAL | APPLIED | Initial Fluid Saturations | | After Centrifuging | |
| SAMPLE ID. | DEPTH, ft. | ORIENTATION (1) | DRY BULK, g/cc | GRAIN, g/cc | POROSITY, %Vb | FORCE, RPM | WATER (Swi) SATURATION | NAPL (Soi) SATURATION | WATER (Srw) SATURATION | NAPL (Sor) SATURATION |
| TL-MW-14-11-11.5 | 11.6 | H | 1.63 | 2.72 | 40.0 | 250 | 43.7 | 13.9 | 52.2 | 13.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 500 | 52.2 | 13.9 | 61.9 | 13.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |
| | | | | | | 1000 | 61.9 | 13.9 | 72.4 | 13.9 |
| NOTE: No visible NAPL produced. | | | | | | | | | | |

N/A = Not Analyzed. Vb = Bulk Volume, Pv = Pore Volume. (1) H = horizontal, V = vertical, R = remold
Soi = Initial NAPL Saturation as received prior to centrifuging, Swi = Initial Water Saturation as received prior to centrifuging
Sor = Residual NAPL Saturation after centrifuging, Srw = Residual Water Saturation after centrifuging
Water =0.9996 g/cc, NAPL = 0.9133 g/cc.

Eff. 20121001

# FREE PRODUCT (NAPL) MOBILITY STEPPED UNDER WATER- CENTRIFUGAL METHOD PROCEDURE

(Method: ASTM D425 Modified per GeoEngineers, Inc.)

## Purpose

The purpose of this test is to demonstrate whether NAPL present in a soil is mobile under water and if so, what is the residual saturation after mobile NAPL is removed from the soil. Per client instruction the forces and/or speeds applied are 250RPM, 500RPM, and 1000RPM for one hour at each speed.

## Method Summary

Free product (NAPL) mobility of soils under water is determined by inserting undisturbed (native-state) samples into Beckman Model J6B centrifuge (269 rotor, IEC) and standard rock (soil) core buckets (centrifuge imbibition cups), immersing under water, and centrifuging for 1 hour (each speed) at 250RPM, 500RPM and 1000RPM at a controlled temperature of 20 ± 1°C. NAPL produced and water displaced during each centrifugal speed is recorded. Residual fluid saturations are determined by Dean-Stark extraction and sample properties determined at completion of the final centrifuge run.

## Sample Preparation

The core is maintained in frozen condition to preserve water and NAPL saturations.

A one inch (1") diameter sample is cut from core selected by GeoEngineers, Inc. personnel for free product mobility under water; residual, and initial saturation analyses. The sample is cut perpendicular to core axis (horizontal) and tested in native-state condition.

flexible Teflon jacket and stainless steel end screens are applied to maintain the integrity of the sample.

## Free Product (NAPL) Mobility

Following cutting and packaging, the sample is allowed to thaw and is then loaded into a centrifuge imbibition cup and immersed under filtered laboratory fresh tap water for free product mobility under water evaluation. A centrifugal speed of 250RPM is applied to the sample for one hour. The sample is monitored for mobile NAPL (produced NAPL) and water displacement.

a. Record volume of any NAPL produced.
b. Record volume of any water displaced.
c. Record all visual observations of sample behavior and produced NAPL.

This process is repeated at 500RPM and 1000RPM.

## Sample Properties

Following the final spin, the sample is removed from the centrifuge imbibition cup and extracted with toluene (Dean-Stark method) for residual saturations (fluid saturation confirmation). Initial saturations are determined by material balance (fluid summation). Following Dean-Stark extraction, the sample is dried to stable weight and sample properties (porosity, dry bulk density, and grain density) determined.

## Reporting

Data is reported in tabular format and can be presented in an EDD format.

Eff. 20121001

# FREE PRODUCT (NAPL) MOBILITY - CENTRIFUGAL METHOD PROCEDURE

(Method: ASTM D425 Modified per GeoEngineers, Inc.)

## Modifications to ASTM D425

1.1 Covers determination of residual saturation and NAPL mobility by centrifuge method.
1.2 This test uses *undisturbed* specimens of rock or soil.
4.1 Residual saturation determination is conducted on a native-state (undisturbed) sample by centrifuging for times and speeds listed above at a controlled temperature of 20 ± 1°C. Fluids produced are monitored for mobility evaluation and material balance calculations.
5.2 When water and NAPL are present in a sample, the centrifuge moisture equivalent approximates conservative residual saturations for water and NAPL.
6.1-6.3 Beckman Model J6B centrifuge (269 rotor, IEC) and standard rock (soil) core buckets (centrifuge imbibition cups) are used for centrifuging samples.
6.6-6.10 The samples are tested in undisturbed condition and Dean-Stark extraction method (API RP40) is used to determine residual saturations.
7.1-7.2 The samples are tested in undisturbed condition. A 1"dia. x 1.25" long sample is used.
8.1 A native-state (undisturbed) sample is placed in the centrifuge cup for centrifuging.
8.4 Immediately after centrifuging, the volume or mass of fluids produced is recorded and the sample is weighed and placed in the Dean-Stark extraction vessel. Following Dean-Stark extraction, bulk density and porosity are determined.
9.1 The test may be performed on only one sample due to core or material availability constraints.
10.1.2 Post-centrifuging residual saturations and pre-centrifuging initial saturations are reported as pore fluid saturations, percent pore volume.

Ultracentrifuge with rotor and standard rock (soil) core buckets.

8100 Secura Way – Santa Fe Springs, CA 90670
Phone 562.347.2500 Fax 562.907.3610
www.ptslabs.com

PTS File No: 42467
Client: GeoEngineers, Inc.

PTS Laboratories

# VISCOSITY, DENSITY, and SPECIFIC GRAVITY DATA

(METHODOLOGY: ASTM D445, ASTM D1481, API RP40)

PROJECT NAME: R.G. Haley International Site
PROJECT NO: 0356-114-06 T10

| SAMPLE ID | MATRIX | TEMPERATURE, °F | SPECIFIC GRAVITY | DENSITY, g/cc | VISCOSITY | |
|---|---|---|---|---|---|---|
| | | | | | centistokes | centipoise |
| TL-MW-2-062012 | NAPL | 70 | 0.9152 | 0.9133 | 5.12 | 4.68 |

# PTS Laboratories, Inc.

## CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

COMPANY: GeoEngineers

ADDRESS: 600 Stewart St. ste 1700 CITY: Seattle, WA ZIP CODE: 98101

PROJECT MANAGER: Carla Brock

PROJECT NAME: Haley PHONE NUMBER: (425) 269-7255

PROJECT NUMBER: 0356-114-06 T10 FAX NUMBER: (206) 728-2732

SITE LOCATION: Bellingham, WA

SAMPLER SIGNATURE: (Amanda Fochtman)

PO# 0356-114-06 T10

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☒
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT ____ ON ICE ____

PTS QUOTE NO.: 12-005

PTS FILE:

ANALYSIS REQUEST

| SAMPLE ID NUMBER | DATE | TIME | DEPTH, FT | NUMBER OF SAMPLES (6 voa bottles collected) | SOIL PROPERTIES PACKAGE | HYDRAULIC CONDUCTIVITY PACKAGE | PORE FLUID SATURATIONS PACKAGE | TCEQ/TNRCC PROPERTIES PACKAGE | CAPILLARITY PACKAGE | FLUID PROPERTIES PACKAGE | PHOTOLOG: CORE PHOTOGRAPHY | MOISTURE CONTENT, ASTM D2216 | POROSITY: TOTAL, API RP40 | POROSITY: EFFECTIVE, ASTM D425M | SPECIFIC GRAVITY, ASTM D854 | BULK DENSITY (DRY), API RP40 or ASTM D2937 | AIR PERMEABILITY, API RP40 | HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084 | GRAIN SIZE DISTRIBUTION, ASTM D422/4464M | TOC: WALKLEY-BLACK | ATTERBERG LIMITS, ASTM D4318 | Single Point Vis cosity @ 70F ASTM D1481 and D445 | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TL-MW-2-062012 | 6/20/12 | 950 | 8' below TOC | 6 | | | | | | | | | | | | | | | | | | X | PTS Quote 12-005 |
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| 1. RELINQUISHED BY | 2. RECEIVED BY | 3. RELINQUISHED BY | 4. RECEIVED BY |
|---|---|---|---|
| (Amanda Fochtman) | | | |
| COMPANY: GeoEngineers | COMPANY: PTS Labs. Inc | COMPANY: | COMPANY: |
| DATE: 6/20/12 TIME: 1345 | DATE: 6/21/12 TIME: 1607 | DATE: TIME: | DATE: TIME: |

424

PTS Laboratories
8100 Secura Way
Santa Fe Springs, CA 90670

# Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street · Redmond, WA 98052
Phone: (425) 883-3881 · www.onsite-env.com

562-907-3607

Company: GeoEngineers, Inc.
Plaza 600 Building, 600 Stewart St., Ste 1700
Seattle, WA 98101

Project Number: 0356-114-06

Project Name: Haley Site

Project Manager: Carla Brock

Sampled by: Robert N. Miyahira

**Turnaround Request (in working days)**

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☐ Standard (7 Days) (TPH analysis 5 Days)

☐ _____ (other)

**Laboratory Number:**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | No. of Cont. | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664 | Petrophysical testing | Digital imaging | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TL-MW-15_B-6-13.5 | 06/28/12 | 0945 | soil | 5 | | | | | | | | | | | | | | | | | X | X | | | |
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A through E

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GeoEngineers, Inc. | 06/28/12 | 1015 |
| Received | | PTS labs. Inc | 6/29/12 | 1634 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

contact Carla Brock at (296)728-2674 regarding requested testing

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

**PTS** Laboratories, Inc.

# CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

COMPANY: GeoEngineers

ADDRESS: CITY: Seattle ZIP CODE: 98101

PROJECT MANAGER: Carla Brock

PROJECT NAME: R.G. Haley PHONE NUMBER:

PROJECT NUMBER: 0356-114-00 FAX NUMBER:

SITE LOCATION: Bellingham, WA

SAMPLER SIGNATURE: [signature]

PO#:

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☐
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT ✓ ON ICE ✓

PTS QUOTE NO.:

PTS FILE: 42467 42516

ANALYSIS REQUEST

| SAMPLE ID NUMBER | DATE | TIME | DEPTH, FT | NUMBER OF SAMPLES | hold | COMMENTS |
|---|---|---|---|---|---|---|
| TL-MW-14-7-7.5 | 7/11/12 | 1342 | 7-7.5 | 1 | X | |
| TL-MW-14-7.5-8 | | 1340 | 7.5-8 | 1 | X | |
| TL-MW-14-8-8.5 | | 1338 | 8-8.5 | 1 | X | |
| TL-MW-14-9.5-10 | | 1351 | 9.5-10 | 1 | X | |
| TL-MW-14-10-10.5 | | 1349 | 10-10.5 | 1 | X | |
| TL-MW-14-10.5-11 | | 1346 | 10.5-11 | 1 | X | |
| TL-MW-14-11-11.5 | | 1406 | 11-11.5 | 1 | X | |
| TL-MW-14-11.5-12 CB ~~TL-MW-14-12-12.5~~ CB | | 1404 | 11.5 CB -12 | 1 | X | |
| TL-MW-14-12-12.5 | | 1401 | 12-12.5 | 1 | X | |
| TL-MW-14-13.5-13.5 | | 1417 | 13-13.5 | 1 | X | |
| TL-MW-14-13.5-14 | ↓ | 1414 | 13.5-14 | 1 | X | |

| 1. RELINQUISHED BY | 2. RECEIVED BY | 3. RELINQUISHED BY | 4. RECEIVED BY |
|---|---|---|---|
| COMPANY | COMPANY: PTS Labs Inc | COMPANY | COMPANY |
| DATE TIME | DATE: 7/13/12 TIME: 9:19 | DATE TIME | DATE TIME |

**PTS** Laboratories, Inc.

# CHAIN OF CUSTODY RECORD



COMPANY: Geo Engineers

ADDRESS: CITY: Seattle ZIP CODE:

PROJECT MANAGER: Carla Brock

PROJECT NAME: R-6- Haley PHONE NUMBER:

PROJECT NUMBER: 0356-114-00 FAX NUMBER:

SITE LOCATION: Bellingham, WA

SAMPLER SIGNATURE: Carla Brock

PO#:

TURNAROUND TIME
24 HOURS ☐ 5 DAYS ☐
48 HOURS ☐ NORMAL ☐
72 HOURS ☐
OTHER: _____

SAMPLE INTEGRITY (CHECK):
INTACT ✓ ON ICE ✓

PTS QUOTE NO.:

PTS FILE: ~~42516~~ 42467

ANALYSIS REQUEST

| SAMPLE ID NUMBER | DATE | TIME | DEPTH, FT | NUMBER OF SAMPLES | SOIL PROPERTIES PACKAGE | HYDRAULIC CONDUCTIVITY PACKAGE | PORE FLUID SATURATIONS PACKAGE | TCEQ/TNRCC PROPERTIES PACKAGE | CAPILLARITY PACKAGE | FLUID PROPERTIES PACKAGE | PHOTOLOG: CORE PHOTOGRAPHY | MOISTURE CONTENT, ASTM D2216 | POROSITY: TOTAL, API RP40 | POROSITY: EFFECTIVE, ASTM D425M | SPECIFIC GRAVITY, ASTM D854 | BULK DENSITY (DRY), API RP40 or ASTM D2937 | AIR PERMEABILITY, API RP40 | HYDRAULIC CONDUCTIVITY, EPA9100, API RP40, D5084 | GRAIN SIZE DISTRIBUTION, ASTM D422/4464M | TOC: WALKLEY-BLACK | ATTERBERG LIMITS, ASTM D4318 | 1610 | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~TL~~-MW-14-14.5-15 | 7/11/12 | 1425 | 14.5-15 | | | | | | | | | | | | | | | | | | X | X | | | | |
| TL-MW-14-15-15.5 | ↓ | 1423 | 15-15.5 | | | | | | | | | | | | | | | | | | X | X | | | | |
| TL-MW-~~14~~-16.5-17 | | 1450 | 16.5-17 | | | | | | | | | | | | | | | | | | X | X | | | | |
| TL-MW-14-17-17.5 | ↓ | 1507 | 17-17.5 | | | | | | | | | | | | | | | | | | X | X | | | | |
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| 1. RELINQUISHED BY | 2. RECEIVED BY | 3. RELINQUISHED BY | 4. RECEIVED BY |
|---|---|---|---|
| COMPANY | COMPANY PTS LABS Inc | COMPANY | COMPANY |
| DATE TIME | DATE 7/13/12 TIME 9:19 | DATE TIME | DATE TIME |

# EXHIBIT J-2
## Chromatograms and Chemical Analytical Data

# HALEY SITE OIL SAMPLES
# C-GRAMS

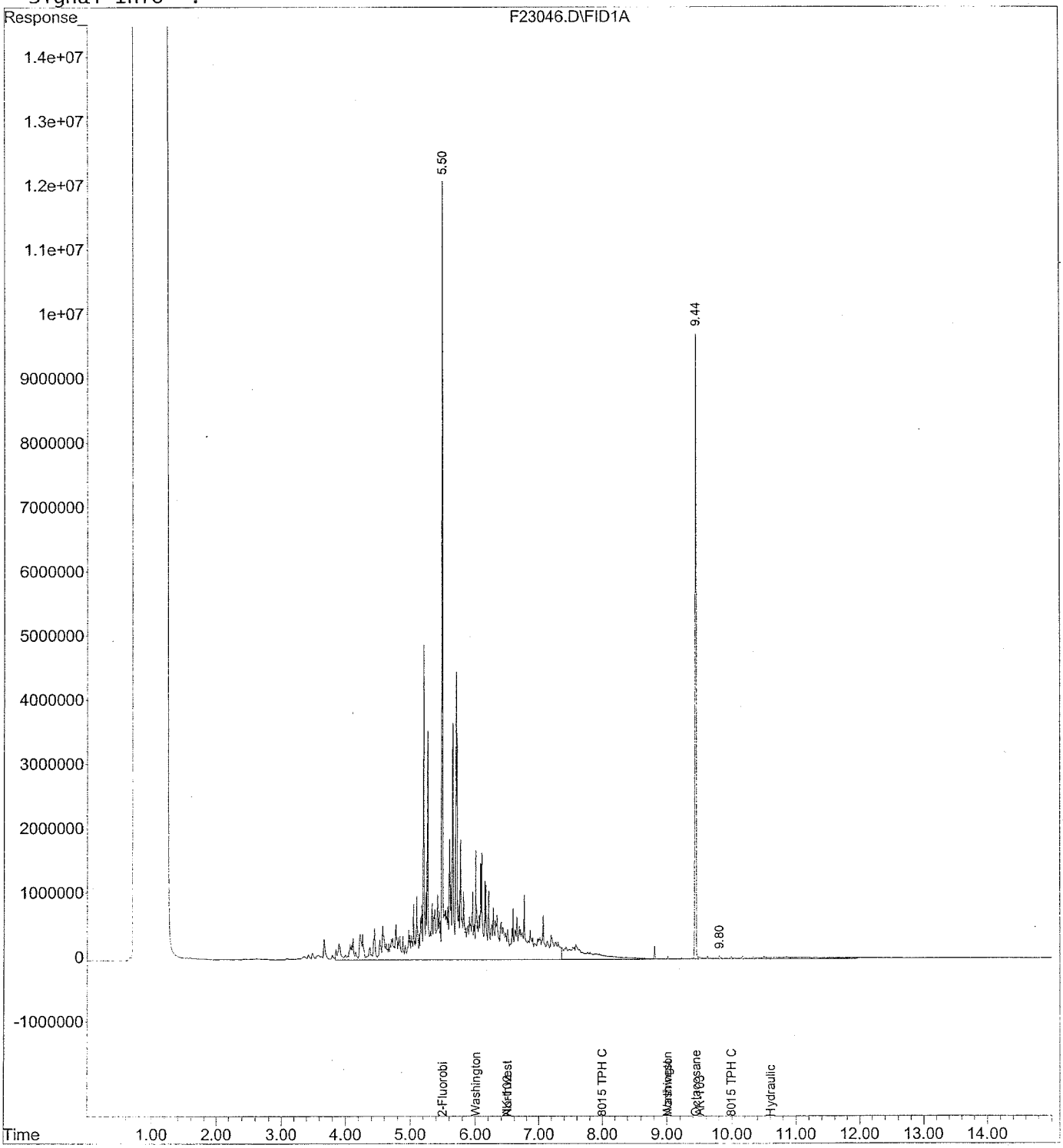
Data File : C:\HPCHEM\1\DATA\062304F\F23046.D Vial: 84
Acq On : 6-23-04 19:20:13 Operator: EDL
Sample : P-9 ccv off of CW Inst : GC #9
Misc : 100/1250 4060221 Multiplr: 1.00
IntFile : SURR.E
Quant Time: Jun 23 19:35 2004 Quant Results File: F1504T9F.RES

Haley P-9

Quant Method : C:\HPCHEM\1\METHODS\F1504T9F.M (Chemstation Integrator)
Title : TPH-D Front
Last Update : Wed Jun 16 17:26:48 2004
Response via : Multiple Level Calibration
DataAcq Meth : F1504T9F.M

Analyzed June 2004

Volume Inj. :
Signal Phase :
Signal Info :

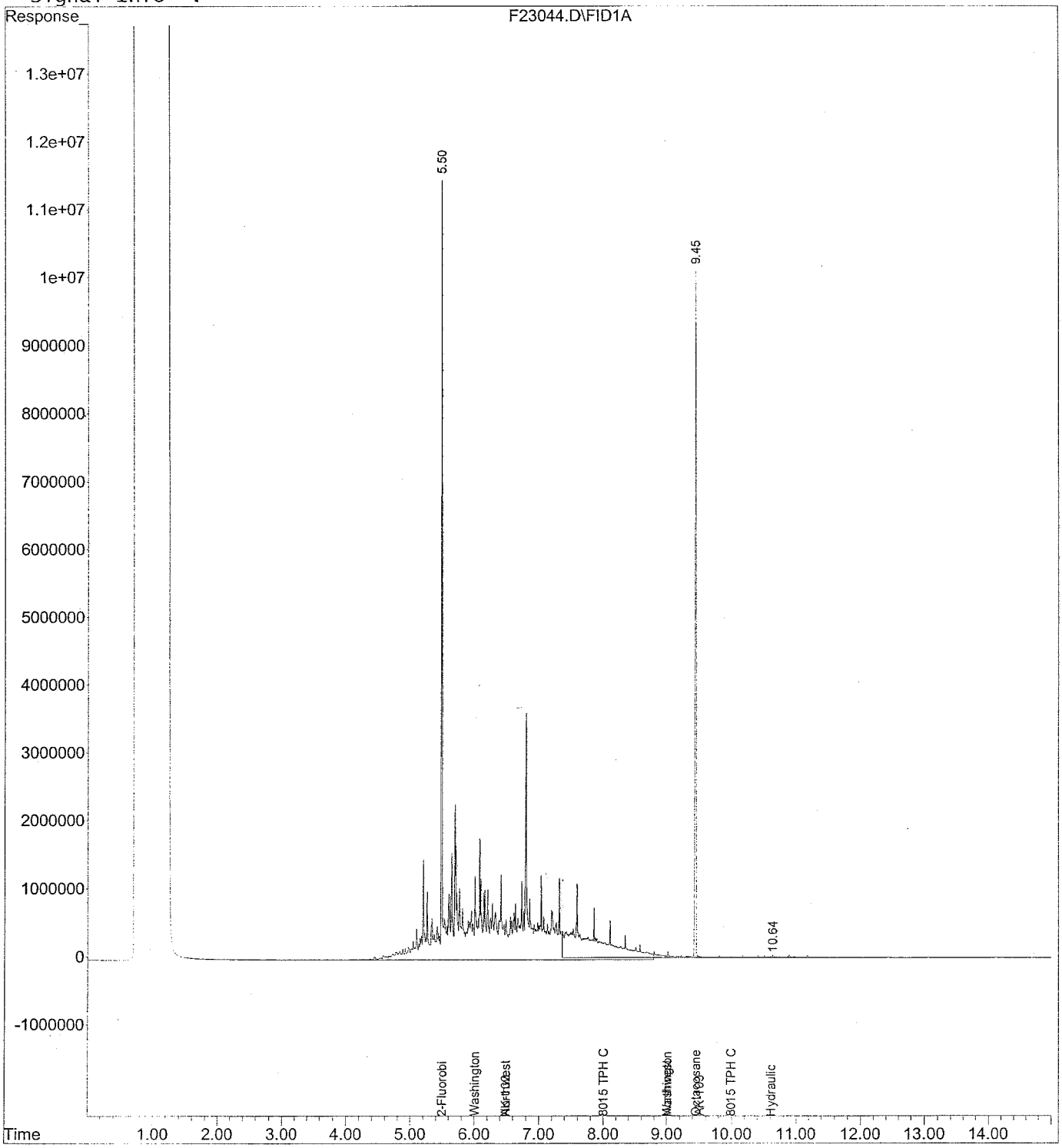


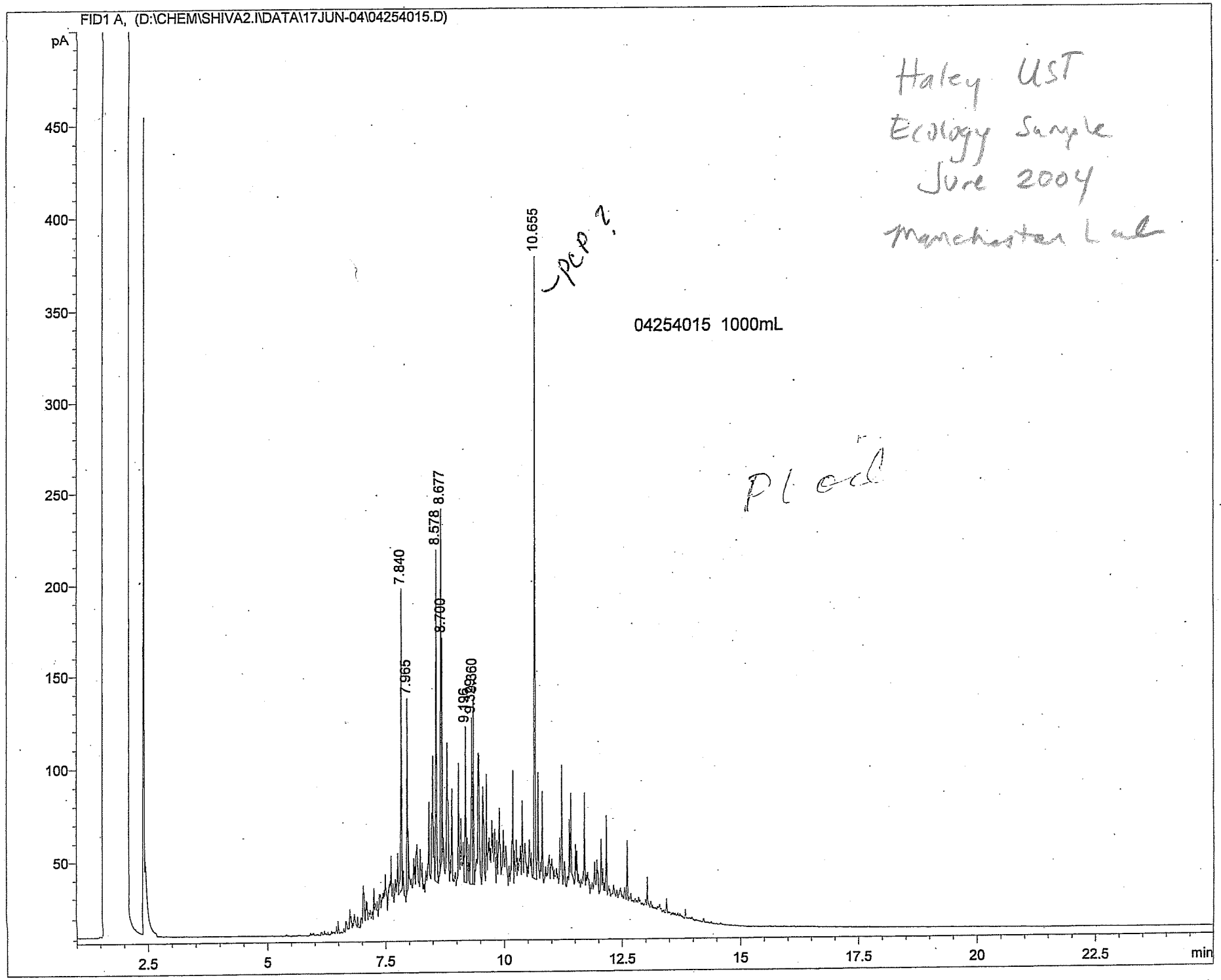
Data File : C:\HPCHEM\1\DATA\062304F\F23044.D Vial: 85
Acq On : 6-23-04 18:57:16 Operator: EDL
Sample : UST ccv UST Product Inst : GC #9
Misc : ~~100/1250 4060222~~ Multiplr: 1.00
IntFile : SURR.E
Quant Time: Jun 23 19:17 2004 Quant Results File: F1504T9F.RES

Quant Method : C:\HPCHEM\1\METHODS\F1504T9F.M (Chemstation Integrator)
Title : TPH-D Front
Last Update : Wed Jun 16 17:26:48 2004
Response via : Multiple Level Calibration
DataAcq Meth : F1504T9F.M

Volume Inj. :
Signal Phase :
Signal Info :

Haley
UST
Sampled
June 2004
by GeoEngineers






Haley UST
Ecology Sample
June 2004
Manchester Lab

PCP ?

Plot



Data File D:\CHEM\SHIVA2.I\DATA\17JUN-04\04254015.D Sample Name: 04254015 1000mL

Shiva 6/17/04 4:39:45 PM

Quantitation Report

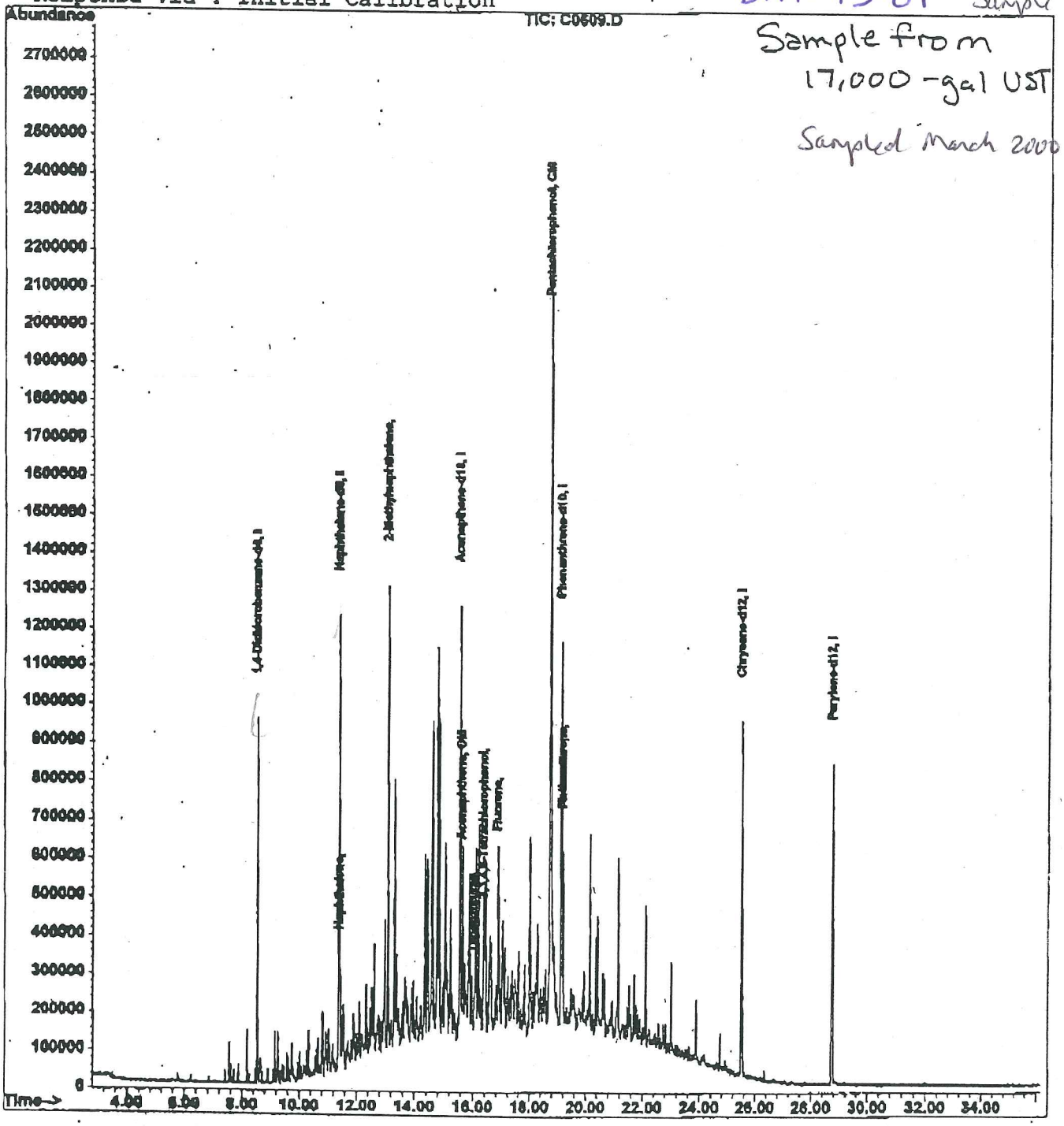
Data File : G:\MS-2DATA\030600\C0609.D
Acq On : 6 Mar 2000 8:29 pm
Sample : B0C0083-01
Misc : 25x 8270 OTHER WET
MS Integration Params: rteint.p
Quant Time: Mar 7 9:04 2000

Vial: 9
Operator: KN
Inst : MS-2
Multiplr: 1.00

Quant Results File: SVOA0002.RES

Method : F:\1\METHODS\SVOA0002.M (RTE Integrator)
Title : SVOCs by Method 8270C
Last Update : Mon Mar 06 16:02:55 2000
Response via : Initial Calibration

Haley UST
BWT-TS-01 - Sample ID
Sample from 17,000-gal UST
Sampled March 2000



# Washington State Department of Ecology
## Manchester Environmental Laboratory
## Analysis Report for
## Hydrocarbon Identification

**Project Name:** R.G. Haley **LIMS Project ID:** 1482-04

**Project Officer:** Charles San Juan **Method:** HYDRO-ID

**Date Reported:** 07/14/04 **Analyte:** Hydrocarbon identification

| Sample | QC | Field ID | Matrix | Result | Qualifier | Units | Collected | Analyzed |
|---|---|---|---|---|---|---|---|---|
| *04254015 | | #1WOODTREATU | Oil/Solvent | | NC | ug/Kg ww | 06/15/04 | 06/17/04 |
| *OBS4169HC | | Lab BLNK | Oil/Solvent | | NC | ug/Kg ww | | 06/17/04 |

### Comments:

**04254015** This sample contains a highly aromatic #2 fuel oil range petroleum product along with what may be pentachlorophenol.

**OBS4169HC** No detectable petroleum hydrocarbons or products found.

Authorized By: _____ Release Date: _____ Page: 1

**Analytical Resources, Incorporated**
Analytical Chemists and Consultants

## ORGANIC COMPOUND DATA REPORTING QUALIFIERS

| | |
|---|---|
| U | Indicates the compound was undetected at the reported concentration. (Same as ND). |
| J | Indicates an estimated concentration when the value is less than the calculated reporting limit. |
| D | Indicates the surrogate/spike(s) was not detected, due to dilution of extract. |
| NR | Indicates the surrogate recovery cannot be reported due to matrix interference. |
| E | Indicates a value above the linear range of the detector. Sample dilution required. |
| S | Indicates no value reported due to saturation of the detector. Sample dilution required. |
| NA | Indicates compound not analyzed for. |
| M | Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match. |
| B | Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample. |
| Y | Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level. |

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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1

Sample No: Tank

Lab Sample ID: BH30A
LIMS ID: 00-1620
Matrix:
Data Release Authorized:
Reported: 02/14/00

QC Report No: BH30-Douglas Management
Project:
Date Sampled: 02/10/00
Date Received: 02/10/00

Date extracted: 02/11/00
Date analyzed: 02/11/00
Instrument: finn2

Sample Amount: 3.00 mL
Final Extract Volume: 100 mL
Dilution Factor: 1:1

| CAS Number | Analyte | ug/L |
|---|---|---|
| 87-86-5 | Pentachlorophenol | 51,000,000 E |

Semivolatiles Surrogate Recovery

2,4,6-Tribromophenol 91.5%

FORM-1

ANALYTICAL RESOURCES INCORPORATED

**ORGANICS ANALYSIS DATA SHEET**
**Semivolatiles by GC/MS**
Page 1 of 1

Lab Sample ID: BH30A-DL
LIMS ID: 00-1620
Matrix:
Data Release Authorized:
Reported: 02/14/00

Sample No: Tank DILUTION
QC Report No: BH30-Douglas Management
Project:
Date Sampled: 02/10/00
Date Received: 02/10/00

Date extracted: 02/11/00
Date analyzed: 02/11/00
Instrument: finn2

Sample Amount: 3.00 mL
Final Extract Volume: 100 mL
Dilution Factor: 1:30

| CAS Number | Analyte | ug/L |
|---|---|---|
| 87-86-5 | Pentachlorophenol | 62,000,000 / 5,110,000 / 6.2% |

**Semivolatiles Surrogate Recovery**

| | |
|---|---|
| 2,4,6-Tribromophenol | 60.8% |

FORM-1

ANALYTICAL RESOURCES INCORPORATED

**ORGANICS ANALYSIS DATA SHEET**
**Semivolatiles by GC/MS**
Page 1 of 1

Sample No: Beach

Lab Sample ID: BH30B
LIMS ID: 00-1621
Matrix:
Data Release Authorized:
Reported: 02/14/00

QC Report No: BH30-Douglas Management
Project:
Date Sampled: 02/10/00
Date Received: 02/10/00

Date extracted: 02/11/00
Date analyzed: 02/11/00
Instrument: finn2

Sample Amount: 3.00 mL
Final Extract Volume: 100 mL
Dilution Factor: 1:1

| CAS Number | Analyte | ug/L |
|---|---|---|
| 87-86-5 | Pentachlorophenol | 170,000 U |

170/million

**Semivolatiles Surrogate Recovery**

| | |
|---|---|
| 2,4,6-Tribromophenol | 77.1% |

FORM-1

ANALYTICAL RESOURCES INCORPORATED

**ORGANICS ANALYSIS DATA SHEET**
**Semivolatiles by GC/MS**
Page 1 of 1

Sample No: Method Blank

Lab Sample ID: BH30MB
LIMS ID: 00-1620
Matrix:
Data Release Authorized:
Reported: 02/14/00

QC Report No: BH30-Douglas Management
Project:
Date Sampled: NA
Date Received: NA

Date extracted: 02/11/00
Date analyzed: 02/11/00
Instrument: finn2

Sample Amount: 3.00 mL
Final Extract Volume: 100 mL
Dilution Factor: 1:1

| CAS Number | Analyte | ug/L |
|---|---|---|
| 87-86-5 | Pentachlorophenol | 170,000 U |

**Semivolatiles Surrogate Recovery**

| | |
|---|---|
| 2,4,6-Tribromophenol | 86.9% |

FORM-1

ANALYTICAL RESOURCES INCORPORATED

**ORGANICS ANALYSIS DATA SHEET**
**Semivolatiles by GC/MS**
**Page 1 of 1**

Lab Sample ID: BH30SB
LIMS ID: 00-1620
Matrix:

QC Report No: BH30-Douglas Management
Project:

Data Release Authorized:
Reported: 02/14/00

**LABORATORY CONTROL SAMPLE**
Date extracted: 02/11/00
Date analyzed: 02/11/00

| CONSTITUENT | SPIKE VALUE | SPIKE ADDED | % RECOVERY |
|---|---|---|---|
| Pentachlorophenol | 111000 | 833000 | 133% |

**Lab Control Surrogate Recovery**

| | |
|---|---|
| 2,4,6-Tribromophenol | 93.3% |

Reported in Total ug/L

**FORM-III**

ANALYTICAL RESOURCES INCORPORATED

## WATER SEMIVOLATILE SURROGATE RECOVERY SUMMARY

Matrix: QC Report No: BH30-Douglas Management
Project:

| Client ID | PHL | 2FP | TBP | 2CP | TOT OUT |
|---|---|---|---|---|---|
| Method Blank | | | 86.9% | | 0 |
| Lab Control | | | 93.3% | | 0 |
| Tank | | | 91.5% | | 0 |
| Tank-DL | | | 60.8% | | 0 |
| Beach | | | 77.1% | | 0 |

SEP FUNNEL SW3510B

| | | LCS/MB LIMITS | QC LIMITS |
|---|---|---|---|
| (PHL) | = Phenol-d5 | (25-100) | (10-101) |
| (2FP) | = 2-Fluorophenol | (32-100) | (10-111) |
| (TBP) | = 2,4,6-Tribromophenol | (27-120) | (10-134) |
| (2CP) | = 2-Chlorophenol-d4 | (47-103) | (10-129) |

\# Column to be used to flag recovery values

* Values outside of required QC limits

D Surrogate Compound diluted out

# Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard Washington 98366

**CASE NARRATIVE**

**March 28, 2000**

Subject: R.G.Haley Project

Sample(s): 00108020 and 00108025

Officer(s): Lucy Pebles

By: Bob Carrell
Organics Analysis Unit

## *CHLORINATED PHENOLS ANALYSIS*

**ANALYTICAL METHOD(S): (Draft EPA Method 8085)**

The water fraction was separated from the floating oil and each portion was given a sample number. Taking advantage of the fact that pentachlorophenol (PCP) is water soluble at high pH and that interferencing organic compounds can be removed without effecting the PCP, two grams of the sample 00108020 (oil) was added to 200 mL of water that had a pH of 13-14. This sample, the water sample and two water method blanks, similarly pH adjusted, were then extracted twice with methylene chloride and the solvent discarded. The pH was then adjusted to less than 2 and the water was extracted twice more with methylene chloride. This solvent was exchanged to hexane followed by derivatization. These extracts were then analyzed by capillary Gas Chromatography and Atomic Emission Detection (GC/AED). Confirmation of chlorinated phenols was performed by Gas Chromatography and Ion-Trap mass spectrometry (GC/ITD) or comparisons of elemental ratios of hetero-atoms to empirical formulas.

All analytes have a respective practical quantitation limit (PQL) that is higher than the corresponding method detection limit (MDL). If a target analyte is detected and its identification is unambiguously confirmed at a concentration below its PQL, the reported concentration is qualified as an estimate, ' J' qualifier.

**HOLDING TIMES:**

All samples were extracted and analyzed within the recommended method holding times.

**BLANKS:**

No target compounds were detected in the laboratory blanks at or above the reported value, thereby demonstrating that the system was free from contamination.

**SURROGATES:**

The 2,4,6-tribromophenol surrogate recoveries were acceptable, ranging from 83% to 103%.

**MATRIX SPIKING:**

N/A

**COMMENTS:**

In the manufacture of PCP, trichlorophenols and tetrachlorophenols are also produced, but to much smaller degrees. They tend to be found when high concentrations of PCP are detected, and as such we include them in our analysis for chlorinated phenols. The "J" qualifier for the PCP on the water sample is because of the distinct possibility that some of the oil associated with this sample was entrained in the water and caused an artificial elevation of the value.

A number of late eluting heavily chlorinated compounds were also observed in these samples. Subsequent GC/MS analysis tentatively identified some of these compounds to be chlorinated dibenzo-p-dioxins and it is likely that others in this group are the dibenzofurans. It also is likely that some of these compounds are various chlorinated diphenylethers, which are precursors to dioxins. In any event, some of these compounds are about two orders of magnitude larger than the PCP that is in these samples. It is recommended that the oil sample be sent out for analysis of the dioxin and dibenzofuran concentrations.

The data is useable as qualified.

***DATA QUALIFIER CODES***

| | | |
|---|---|---|
| U | - | The analyte was not detected at or above the reported result. |
| J | - | The analyte was positively identified. The associated numerical result is an estimate. |
| UJ | - | The analyte was not detected at or above the reported estimated result. |
| REJ | - | The data are unusable for all purposes. |
| NAF | - | Not analyzed for. |
| N | - | For organic analytes there is evidence the analyte is present in this sample. |
| NJ | - | There is evidence that the analyte is present. The associated numerical result is an estimate. |
| NC | - | Not Calculated |
| E | - | This qualifier is used when the concentration of the associated value exceeds the known calibration range. |

# Department of Ecology

## Analysis Report for

## Chlorophenoxy Herbicides

**Project Name:** RG Haley

**LIMS Project ID:** 1922-00

**Lab ID:** OBW0070A1
**QC Type:** Laboratory Method Blank
**Project Officer:** Lucy Pebles

**Date Prepared:** 03/10/00
**Date Analyzed:** 03/15/00

**Method:** SW8085
**Matrix:** Water
**Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.75 | U |
| 2,4,5-Trichlorophenol | 0.75 | U |
| 2,3,4,6-Tetrachlorophenol | 0.69 | U |
| 2,3,4,5-Tetrachlorophenol | 0.69 | U |
| Pentachlorophenol | 0.63 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| 2,4,6-Tribromophenol | 95 | % |

Authorized By: _____ Release Date: 3-28-2000 Page:

# Department of Ecology

## Analysis Report for

## Chlorophenoxy Herbicides

**Project Name:** RG Haley

**LIMS Project ID:** 1922-00

**Lab ID:** OBW0070A2
**QC Type:** Laboratory Method Blank
**Project Officer:** Lucy Pebles

**Date Prepared:** 03/10/00
**Date Analyzed:** 03/15/00

**Method:** SW8085
**Matrix:** Water
**Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.75 | U |
| 2,4,5-Trichlorophenol | 0.75 | U |
| 2,3,4,6-Tetrachlorophenol | 0.69 | U |
| 2,3,4,5-Tetrachlorophenol | 0.69 | U |
| Pentachlorophenol | 0.63 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| 2,4,6-Tribromophenol | 83 | % |

Authorized By: Barnell

Release Date: 3-26-2000

Page:

# Department of Ecology

## Analysis Report for

## Chlorophenoxy Herbicides

**Project Name:** RG Haley **LIMS Project ID:** 1922-00

**Sample:** 00108020 **Date Collected:** 03/07/00 **Method:** SW8085
**Field ID:** 3ECY02 **Matrix:** Oil/Solvent
**Project Officer:** Lucy Pebles **Date Analyzed:** 03/15/00 **Units:** ug/Kg ww

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 380 | U |
| 2,4,5-Trichlorophenol | 380 | U |
| **2,3,4,6-Tetrachlorophenol** | **200** | **J** |
| 2,3,4,5-Tetrachlorophenol | 340 | U |
| **Pentachlorophenol** | **2100** | |

**Surrogate Recoveries**

| | | |
|---|---|---|
| 2,4,6-Tribromophenol | 101 | % |

Authorized By: _____ Release Date: 5-26-2000 Page:

# Department of Ecology

## Analysis Report for

## Chlorophenoxy Herbicides

**Project Name:** RG Haley **LIMS Project ID:** 1922-00

**Sample:** 00108025 **Date Collected:** 03/07/00 **Method:** SW8085
**Field ID:** 3ECY02 **Date Prepared:** 03/10/00 **Matrix:** Water
**Project Officer:** Lucy Pebles **Date Analyzed:** 03/15/00 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.75 | U |
| 2,4,5-Trichlorophenol | 0.75 | U |
| **2,3,4,6-Tetrachlorophenol** | **0.65** | **J** |
| 2,3,4,5-Tetrachlorophenol | 0.69 | U |
| **Pentachlorophenol** | **2.5** | **J** |

**Surrogate Recoveries**

| | | |
|---|---|---|
| 2,4,6-Tribromophenol | 103 | % |

Authorized By: _____ Release Date: 3-24-2000 Page:

1700 Elm Street - Suite 200
Minneapolis, MN 55414

Pace Analytical™

Tel: 612-607-1700
Fax: 612-607-6444

R.G. Haley Project.

## Method 8290 Analysis Results

Client - WASHINGTON DOE

DRAFT

| | | | |
|---|---|---|---|
| Client's Sample ID | 108020 | | |
| Lab Sample ID | 1956019 | | |
| Filename | V00410E | | |
| Injected By | DGP | | |
| Total Amount Extracted | 0.0436 mg | Matrix | OIL |
| % Moisture | NA | Dilution | NA |
| Dry Weight Extracted | NA | Collected | NA |
| ICAL Date | 02/07/2000 | Received | 04/06/2000 |
| CCal Filename(s) | V00410C & V00410N | Extracted | 04/07/2000 |
| Method Blank ID | BLANK-040700 | Analyzed | 04/10/2000 14:03 |

| Native Isomers | Conc ug/g | EMPC ug/g | LOD ug/g | | Internal Standards | ng's Added | Percent Recovery |
|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDF | ND | | 0.29 | | 2,3,7,8-TCDF-13C | 1.00 | 91 |
| Total TCDF | ND | | 0.29 | | 2,3,7,8-TCDD-13C | 1.00 | 100 |
| | | | | | 1,2,3,7,8-PeCDF-13C | 1.00 | 84 |
| 2,3,7,8-TCDD | ND | | 0.34 | | 2,3,4,7,8-PeCDF-13C | 1.00 | 86 |
| Total TCDD | ND | | 0.34 | | 1,2,3,7,8-PeCDD-13C | 1.00 | 93 |
| | | | | | 1,2,3,4,7,8-HxCDF-13C | 1.00 | 90 |
| 1,2,3,7,8-PeCDF | | 0.68 | 0.20 | E | 1,2,3,6,7,8-HxCDF-13C | 1.00 | 98 |
| 2,3,4,7,8-PeCDF | ND | | 0.13 | | 2,3,4,6,7,8-HxCDF-13C | 1.00 | 99 |
| Total PeCDF | 0.24 | | 0.16 | | 1,2,3,7,8,9-HxCDF-13C | 1.00 | 94 |
| | | | | | 1,2,3,4,7,8-HxCDD-13C | 1.00 | 102 |
| 1,2,3,7,8-PeCDD | ND | | 0.36 | | 1,2,3,6,7,8-HxCDD-13C | 1.00 | 107 |
| Total PeCDD | ND | | 0.36 | | 1,2,3,4,6,7,8-HpCDF-13C | 1.00 | 89 |
| | | | | | 1,2,3,4,7,8,9-HpCDF-13C | 1.00 | 92 |
| 1,2,3,4,7,8-HxCDF | | 0.44 | 0.20 | E | 1,2,3,4,6,7,8-HpCDD-13C | 1.00 | 104 |
| 1,2,3,6,7,8-HxCDF | ND | | 0.23 | | OCDD-13C | 2.00 | 89 |
| 2,3,4,6,7,8-HxCDF | ND | | 0.21 | | | | |
| 1,2,3,7,8,9-HxCDF | ND | | 0.23 | | 1,2,3,4-TCDD-13C | 1.00 | NA |
| Total HxCDF | 2.20 | | 0.22 | | 1,2,3,7,8,9-HxCDD-13C | 1.00 | NA |
| | | | | | 2,3,7,8-TCDD-37Cl4 | 0.00 | NC |
| 1,2,3,4,7,8-HxCDD | ND | | 0.50 | | | | |
| 1,2,3,6,7,8-HxCDD | ND | | 0.44 | | | | |
| 1,2,3,7,8,9-HxCDD | ND | | 0.38 | | | | |
| Total HxCDD | 1.60 | | 0.44 | | | | |
| 1,2,3,4,6,7,8-HpCDF | 1.30 | | 0.11 | | Total 2,3,7,8-TCDD | | |
| 1,2,3,4,7,8,9-HpCDF | ND | | 0.24 | | Equivalence: 0.41 ug/g | | |
| Total HpCDF | 6.10 | | 0.18 | | (Using ITE Factors) | | |
| 1,2,3,4,6,7,8-HpCDD | 19.00 | | 0.27 | | | | |
| Total HpCDD | 32.00 | | 0.27 | | | | |
| OCDF | 6.30 | | 0.39 | | | | |
| OCDD | 200.00 | | 0.27 | | | | |

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Results reported on a total weight basis

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
LOD = Limit of Detection
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated

Report No.....00-1031447

## REPORT OF LABORATORY ANALYSIS

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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711
541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | **Reported:**<br>03/14/00 13:42 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| BWT-TS-01 | B0C0083-01 | Other wet | 03/03/00 16:00 | 03/03/00 20:20 |
| BWT-MW02-P01 | B0C0083-02 | Water | 03/03/00 18:20 | 03/03/00 20:20 |

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Steve Davis, Project Manager

www.ncalabs.com

Seattle [illegible] 425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | Reported:<br>03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-TS-01 (B0C0083-01) Other wet** | **Sampled: 03/03/00 16:00** | | **Received: 03/03/00 20:20** | | | | | | |
| Acenaphthene | ND | 375 | mg/kg | 25 | 0C06019 | 03/06/00 | 03/06/00 | EPA 8270C | |
| Acenaphthylene | ND | 375 | " | " | " | " | " | " | |
| Aniline | ND | 375 | " | " | " | " | " | " | |
| **Anthracene** | **2730** | 375 | " | " | " | " | " | " | |
| Benzoic Acid | ND | 1880 | " | " | " | " | " | " | |
| Benzo (a) anthracene | ND | 375 | " | " | " | " | " | " | |
| Benzo (b) fluoranthene | ND | 375 | " | " | " | " | " | " | |
| Benzo (k) fluoranthene | ND | 375 | " | " | " | " | " | " | |
| Benzo (ghi) perylene | ND | 375 | " | " | " | " | " | " | |
| Benzo (a) pyrene | ND | 375 | " | " | " | " | " | " | |
| Benzyl alcohol | ND | 375 | " | " | " | " | " | " | |
| Bis(2-chloroethoxy)methane | ND | 375 | " | " | " | " | " | " | |
| Bis(2-chloroethyl)ether | ND | 375 | " | " | " | " | " | " | |
| Bis(2-chloroisopropyl)ether | ND | 375 | " | " | " | " | " | " | |
| Bis(2-ethylhexyl)phthalate | ND | 375 | " | " | " | " | " | " | |
| 4-Bromophenyl phenyl ether | ND | 375 | " | " | " | " | " | " | |
| Butyl benzyl phthalate | ND | 375 | " | " | " | " | " | " | |
| Carbazole | ND | 375 | " | " | " | " | " | " | |
| 4-Chloroaniline | ND | 1880 | " | " | " | " | " | " | |
| 2-Chloronaphthalene | ND | 375 | " | " | " | " | " | " | |
| 4-Chloro-3-methylphenol | ND | 375 | " | " | " | " | " | " | |
| 2-Chlorophenol | ND | 375 | " | " | " | " | " | " | |
| 4-Chlorophenyl phenyl ether | ND | 375 | " | " | " | " | " | " | |
| Chrysene | ND | 375 | " | " | " | " | " | " | |
| Dibenz (a,h) anthracene | ND | 1880 | " | " | " | " | " | " | |
| **Dibenzofuran** | **390** | 375 | " | " | " | " | " | " | |
| Di-n-butyl phthalate | ND | 375 | " | " | " | " | " | " | |
| 1,3-Dichlorobenzene | ND | 375 | " | " | " | " | " | " | |
| 1,4-Dichlorobenzene | ND | 375 | " | " | " | " | " | " | |
| 1,2-Dichlorobenzene | ND | 375 | " | " | " | " | " | " | |
| 3,3'-Dichlorobenzidine | ND | 18800 | " | " | " | " | " | " | |
| 2,4-Dichlorophenol | ND | 375 | " | " | " | " | " | " | |
| Diethyl phthalate | ND | 375 | " | " | " | " | " | " | |
| 2,4-Dimethylphenol | ND | 750 | " | " | " | " | " | " | |
| Dimethyl phthalate | ND | 375 | " | " | " | " | " | " | |
| 4,6-Dinitro-2-methylphenol | ND | 1880 | " | " | " | " | " | " | |
| 2,4-Dinitrophenol | ND | 1880 | " | " | " | " | " | " | |
| 2,4-Dinitrotoluene | ND | 1880 | " | " | " | " | " | " | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | **Reported:**<br>03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Note. |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-TS-01 (B0C0083-01) Other wet** | **Sampled: 03/03/00 16:00** | | **Received: 03/03/00 20:20** | | | | | | |
| 2,6-Dinitrotoluene | ND | 1880 | mg/kg | 25 | 0C06019 | 03/06/00 | 03/06/00 | EPA 8270C | |
| Di-n-octyl phthalate | ND | 375 | " | " | " | " | " | " | |
| Fluoranthene | ND | 375 | " | " | " | " | " | " | |
| **Fluorene** | **1100** | 375 | " | " | " | " | " | " | |
| Hexachlorobenzene | ND | 375 | " | " | " | " | " | " | |
| Hexachlorobutadiene | ND | 375 | " | " | " | " | " | " | |
| Hexachlorocyclopentadiene | ND | 1880 | " | " | " | " | " | " | |
| Hexachloroethane | ND | 375 | " | " | " | " | " | " | |
| Indeno (1,2,3-cd) pyrene | ND | 375 | " | " | " | " | " | " | |
| Isophorone | ND | 375 | " | " | " | " | " | " | |
| **2-Methylnaphthalene** | **8530** | 375 | " | " | " | " | " | " | |
| 2-Methylphenol | ND | 375 | " | " | " | " | " | " | |
| 3 & 4-Methylphenol | ND | 375 | " | " | " | " | " | " | |
| **Naphthalene** | **1490** | 375 | " | " | " | " | " | " | |
| 2-Nitroaniline | ND | 1880 | " | " | " | " | " | " | |
| 3-Nitroaniline | ND | 1880 | " | " | " | " | " | " | |
| 4-Nitroaniline | ND | 1880 | " | " | " | " | " | " | |
| Nitrobenzene | ND | 375 | " | " | " | " | " | " | |
| 2-Nitrophenol | ND | 375 | " | " | " | " | " | " | |
| 4-Nitrophenol | ND | 1880 | " | " | " | " | " | " | |
| N-Nitrosodiphenylamine | ND | 1880 | " | " | " | " | " | " | |
| N-Nitrosodi-n-propylamine | ND | 375 | " | " | " | " | " | " | |
| **Pentachlorophenol** | **68500** | 1880 | " | " | " | " | " | " | |
| **Phenanthrene** | **2680** | 375 | " | " | " | " | " | " | A-01 |
| Phenol | ND | 375 | " | " | " | " | " | " | |
| Pyrene | ND | 375 | " | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | ND | 375 | " | " | " | " | " | " | |
| 2,4,5-Trichlorophenol | ND | 375 | " | " | " | " | " | " | |
| 2,4,6-Trichlorophenol | ND | 375 | " | " | " | " | " | " | |
| *Surrogate: 2-FP* | *55.0 %* | *19-141* | | | " | " | " | " | |
| *Surrogate: Phenol-d6* | *%* | *44-128* | | | " | " | " | " | |
| *Surrogate: 2,4,6-TBP* | *10.0 %* | *10-137* | | | " | " | " | " | *S-01* |
| *Surrogate: Nitrobenzene-d5* | *135 %* | *33-108* | | | " | " | " | " | |
| *Surrogate: 2-FBP* | *%* | *51-124* | | | " | " | " | " | *S-01* |
| *Surrogate: p-Terphenyl-d14* | *125 %* | *48-149* | | | " | " | " | " | *S-01* |

North Creek Analytical - Bothell

Steve Davis, Project Manager

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|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | Reported:<br>03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-MW02-P01 (B0C0083-02) Water** | **Sampled: 03/03/00 18:20** | | **Received: 03/03/00 20:20** | | | | | | |
| 2,3,4,6-Tetrachlorophenol | ND | 1240 | ug/l | 100 | 0C08003 | 03/08/00 | 03/11/00 | EPA 8270C | |
| Acenaphthene | ND | 1240 | " | " | " | " | " | " | |
| Acenaphthylene | ND | 1240 | " | " | " | " | " | " | |
| Aniline | ND | 1240 | " | " | " | " | " | " | |
| Anthracene | ND | 1240 | " | " | " | " | " | " | |
| Benzoic Acid | ND | 1240 | " | " | " | " | " | " | |
| Benzo (a) anthracene | ND | 1240 | " | " | " | " | " | " | |
| Benzo (b) fluoranthene | ND | 1240 | " | " | " | " | " | " | |
| Benzo (k) fluoranthene | ND | 1240 | " | " | " | " | " | " | |
| Benzo (ghi) perylene | ND | 1240 | " | " | " | " | " | " | |
| Benzo (a) pyrene | ND | 1240 | " | " | " | " | " | " | |
| Benzyl alcohol | ND | 1240 | " | " | " | " | " | " | |
| Bis(2-chloroethoxy)methane | ND | 1240 | " | " | " | " | " | " | |
| Bis(2-chloroethyl)ether | ND | 1240 | " | " | " | " | " | " | |
| Bis(2-chloroisopropyl)ether | ND | 1240 | " | " | " | " | " | " | |
| Bis(2-ethylhexyl)phthalate | ND | 6220 | " | " | " | " | " | " | |
| 4-Bromophenyl phenyl ether | ND | 1240 | " | " | " | " | " | " | |
| Butyl benzyl phthalate | ND | 1240 | " | " | " | " | " | " | |
| Carbazole | ND | 1240 | " | " | " | " | " | " | |
| 4-Chloroaniline | ND | 1240 | " | " | " | " | " | " | |
| 2-Chloronaphthalene | ND | 1240 | " | " | " | " | " | " | |
| 4-Chloro-3-methylphenol | ND | 1240 | " | " | " | " | " | " | |
| 2-Chlorophenol | ND | 1240 | " | " | " | " | " | " | |
| 4-Chlorophenyl phenyl ether | ND | 1240 | " | " | " | " | " | " | |
| Chrysene | ND | 1240 | " | " | " | " | " | " | |
| Dibenz (a,h) anthracene | ND | 1240 | " | " | " | " | " | " | |
| Dibenzofuran | ND | 1240 | " | " | " | " | " | " | |
| Di-n-butyl phthalate | ND | 1240 | " | " | " | " | " | " | |
| 1,3-Dichlorobenzene | ND | 1240 | " | " | " | " | " | " | |
| 1,4-Dichlorobenzene | ND | 1240 | " | " | " | " | " | " | |
| 1,2-Dichlorobenzene | ND | 1240 | " | " | " | " | " | " | |
| 3,3'-Dichlorobenzidine | ND | 1240 | " | " | " | " | " | " | |
| 2,4-Dichlorophenol | ND | 1240 | " | " | " | " | " | " | |
| Diethyl phthalate | ND | 1240 | " | " | " | " | " | " | |
| 2,4-Dimethylphenol | ND | 1240 | " | " | " | " | " | " | |
| Dimethyl phthalate | ND | 1240 | " | " | " | " | " | " | |
| 4,6-Dinitro-2-methylphenol | ND | 1240 | " | " | " | " | " | " | |
| 2,4-Dinitrophenol | ND | 2490 | " | " | " | " | " | " | |

North Creek Analytical - Bothell

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|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | Reported:<br>03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-MW02-P01 (B0C0083-02) Water** | **Sampled: 03/03/00 18:20** | | **Received: 03/03/00 20:20** | | | | | | |
| 2,4-Dinitrotoluene | ND | 1240 | ug/l | 100 | 0C08003 | 03/08/00 | 03/11/00 | EPA 8270C | |
| 2,6-Dinitrotoluene | ND | 1240 | " | " | " | " | " | " | |
| Di-n-octyl phthalate | ND | 1240 | " | " | " | " | " | " | |
| Fluoranthene | ND | 1240 | " | " | " | " | " | " | |
| **Fluorene** | **1450** | 1240 | " | " | " | " | " | " | |
| Hexachlorobenzene | ND | 1240 | " | " | " | " | " | " | |
| Hexachlorobutadiene | ND | 1240 | " | " | " | " | " | " | |
| Hexachlorocyclopentadiene | ND | 1240 | " | " | " | " | " | " | |
| Hexachloroethane | ND | 1240 | " | " | " | " | " | " | |
| Indeno (1,2,3-cd) pyrene | ND | 1240 | " | " | " | " | " | " | |
| Isophorone | ND | 1240 | " | " | " | " | " | " | |
| **2-Methylnaphthalene** | **1790** | 1240 | " | " | " | " | " | " | |
| 2-Methylphenol | ND | 1240 | " | " | " | " | " | " | |
| 3 & 4-Methylphenol | ND | 1240 | " | " | " | " | " | " | |
| Naphthalene | ND | 1240 | " | " | " | " | " | " | |
| 2-Nitroaniline | ND | 1240 | " | " | " | " | " | " | |
| 3-Nitroaniline | ND | 1240 | " | " | " | " | " | " | |
| 4-Nitroaniline | ND | 1240 | " | " | " | " | " | " | |
| Nitrobenzene | ND | 1240 | " | " | " | " | " | " | |
| 2-Nitrophenol | ND | 1240 | " | " | " | " | " | " | |
| 4-Nitrophenol | ND | 1240 | " | " | " | " | " | " | |
| N-Nitrosodiphenylamine | ND | 1240 | " | " | " | " | " | " | |
| N-Nitrosodi-n-propylamine | ND | 1240 | " | " | " | " | " | " | |
| Pentachlorophenol | ND | 1240 | " | " | " | " | " | " | |
| **Phenanthrene** | **2260** | 1240 | " | " | " | " | " | " | |
| Phenol | ND | 1240 | " | " | " | " | " | " | |
| Pyrene | ND | 1240 | " | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | ND | 1240 | " | " | " | " | " | " | |
| 2,4,5-Trichlorophenol | ND | 1240 | " | " | " | " | " | " | |
| 2,4,6-Trichlorophenol | ND | 1240 | " | " | " | " | " | " | |
| *Surrogate: 2-FP* | *%* | *40-115* | | | " | " | " | " | |
| *Surrogate: Phenol-d6* | *4.00 %* | *18-145* | | | " | " | " | " | *S-01* |
| *Surrogate: 2,4,6-TBP* | *%* | *24-130* | | | " | " | " | " | *S-01* |
| *Surrogate: Nitrobenzene-d5* | *76.0 %* | *42-110* | | | " | " | " | " | *S-01* |
| *Surrogate: 2-FBP* | *19.9 %* | *46-116* | | | " | " | " | " | |
| *Surrogate: p-Terphenyl-d14* | *12.0 %* | *63-117* | | | " | " | " | " | *S-01* |
| | | | | | | | | | *S-01* |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | Reported: |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C06019: Prepared 03/06/00 Using EPA 3580A** | | | | | | | | | | |
| **Blank (0C06019-BLK1)** | | | | | | | | | | |
| Acenaphthene | ND | 15.0 | mg/kg | | | | | | | |
| Acenaphthylene | ND | 15.0 | " | | | | | | | |
| Aniline | ND | 15.0 | " | | | | | | | |
| Anthracene | ND | 15.0 | " | | | | | | | |
| Benzoic Acid | ND | 75.0 | " | | | | | | | |
| Benzo (a) anthracene | ND | 15.0 | " | | | | | | | |
| Benzo (b) fluoranthene | ND | 15.0 | " | | | | | | | |
| Benzo (k) fluoranthene | ND | 15.0 | " | | | | | | | |
| Benzo (ghi) perylene | ND | 15.0 | " | | | | | | | |
| Benzo (a) pyrene | ND | 15.0 | " | | | | | | | |
| Benzyl alcohol | ND | 15.0 | " | | | | | | | |
| Bis(2-chloroethoxy)methane | ND | 15.0 | " | | | | | | | |
| Bis(2-chloroethyl)ether | ND | 15.0 | " | | | | | | | |
| Bis(2-chloroisopropyl)ether | ND | 15.0 | " | | | | | | | |
| Bis(2-ethylhexyl)phthalate | ND | 15.0 | " | | | | | | | |
| 4-Bromophenyl phenyl ether | ND | 15.0 | " | | | | | | | |
| Butyl benzyl phthalate | ND | 15.0 | " | | | | | | | |
| Carbazole | ND | 15.0 | " | | | | | | | |
| 4-Chloroaniline | ND | 75.0 | " | | | | | | | |
| 2-Chloronaphthalene | ND | 15.0 | " | | | | | | | |
| 4-Chloro-3-methylphenol | ND | 15.0 | " | | | | | | | |
| 2-Chlorophenol | ND | 15.0 | " | | | | | | | |
| 4-Chlorophenyl phenyl ether | ND | 15.0 | " | | | | | | | |
| Chrysene | ND | 15.0 | " | | | | | | | |
| Dibenz (a,h) anthracene | ND | 75.0 | " | | | | | | | |
| Dibenzofuran | ND | 15.0 | " | | | | | | | |
| Di-n-butyl phthalate | ND | 15.0 | " | | | | | | | |
| 1,3-Dichlorobenzene | ND | 15.0 | " | | | | | | | |
| 1,4-Dichlorobenzene | ND | 15.0 | " | | | | | | | |
| 1,2-Dichlorobenzene | ND | 15.0 | " | | | | | | | |
| 3,3'-Dichlorobenzidine | ND | 750 | " | | | | | | | |
| 2,4-Dichlorophenol | ND | 15.0 | " | | | | | | | |
| Diethyl phthalate | ND | 15.0 | " | | | | | | | |
| 2,4-Dimethylphenol | ND | 30.0 | " | | | | | | | |

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | **Reported:** 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C06019: Prepared 03/06/00 Using EPA 3580A** | | | | | | | | | | |
| **Blank (0C06019-BLK1)** | | | | | | | | | | |
| Dimethyl phthalate | ND | 15.0 | mg/kg | | | | | | | |
| 4,6-Dinitro-2-methylphenol | ND | 75.0 | " | | | | | | | |
| 2,4-Dinitrophenol | ND | 75.0 | " | | | | | | | |
| 2,4-Dinitrotoluene | ND | 75.0 | " | | | | | | | |
| 2,6-Dinitrotoluene | ND | 75.0 | " | | | | | | | |
| Di-n-octyl phthalate | ND | 15.0 | " | | | | | | | |
| Fluoranthene | ND | 15.0 | " | | | | | | | |
| Fluorene | ND | 15.0 | " | | | | | | | |
| Hexachlorobenzene | ND | 15.0 | " | | | | | | | |
| Hexachlorobutadiene | ND | 15.0 | " | | | | | | | |
| Hexachlorocyclopentadiene | ND | 75.0 | " | | | | | | | |
| Hexachloroethane | ND | 15.0 | " | | | | | | | |
| Indeno (1,2,3-cd) pyrene | ND | 15.0 | " | | | | | | | |
| Isophorone | ND | 15.0 | " | | | | | | | |
| 2-Methylnaphthalene | ND | 15.0 | " | | | | | | | |
| 2-Methylphenol | ND | 15.0 | " | | | | | | | |
| 3 & 4-Methylphenol | ND | 15.0 | " | | | | | | | |
| Naphthalene | ND | 15.0 | " | | | | | | | |
| 2-Nitroaniline | ND | 75.0 | " | | | | | | | |
| 3-Nitroaniline | ND | 75.0 | " | | | | | | | |
| 4-Nitroaniline | ND | 75.0 | " | | | | | | | |
| Nitrobenzene | ND | 15.0 | " | | | | | | | |
| 2-Nitrophenol | ND | 15.0 | " | | | | | | | |
| 4-Nitrophenol | ND | 75.0 | " | | | | | | | |
| N-Nitrosodiphenylamine | ND | 75.0 | " | | | | | | | |
| N-Nitrosodi-n-propylamine | ND | 15.0 | " | | | | | | | |
| Pentachlorophenol | ND | 75.0 | " | | | | | | | |
| Phenanthrene | ND | 15.0 | " | | | | | | | |
| Phenol | ND | 15.0 | " | | | | | | | |
| Pyrene | ND | 15.0 | " | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 15.0 | " | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 15.0 | " | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 15.0 | " | | | | | | | |
| *Surrogate: 2-FP* | *48.6* | | " | *50.0* | | *97.2* | *19-141* | | | |

North Creek Analytical - Bothell

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Steve Davis, Project Manager

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541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | Reported: |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C06019: Prepared 03/06/00 Using EPA 3580A** | | | | | | | | | | |
| **Blank (0C06019-BLK1)** | | | | | | | | | | |
| *Surrogate: Phenol-d6* | *47.3* | | *mg/kg* | *50.0* | | *94.6* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *41.9* | | *"* | *50.0* | | *83.8* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *49.3* | | *"* | *50.0* | | *98.6* | *33-108* | | | |
| *Surrogate: 2-FBP* | *54.4* | | *"* | *50.0* | | *109* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *52.7* | | *"* | *50.0* | | *105* | *48-149* | | | |
| **LCS (0C06019-BS1)** | | | | | | | | | | |
| Acenaphthene | 114 | 15.0 | mg/kg | 100 | | 114 | 48-110 | | | Q-01 |
| 4-Chloro-3-methylphenol | 236 | 15.0 | " | 200 | | 118 | 34-115 | | | Q-01 |
| 2-Chlorophenol | 208 | 15.0 | " | 200 | | 104 | 57-110 | | | |
| 1,4-Dichlorobenzene | 111 | 15.0 | " | 100 | | 111 | 39-110 | | | Q-01 |
| 2,4-Dinitrotoluene | 110 | 75.0 | " | 100 | | 110 | 50-110 | | | |
| 4-Nitrophenol | 211 | 75.0 | " | 200 | | 106 | 26-116 | | | |
| N-Nitrosodi-n-propylamine | 124 | 15.0 | " | 100 | | 124 | 28-147 | | | |
| Pentachlorophenol | 193 | 75.0 | " | 200 | | 96.5 | 46-120 | | | |
| Phenol | 188 | 15.0 | " | 200 | | 94.0 | 35-110 | | | |
| Pyrene | 106 | 15.0 | " | 100 | | 106 | 35-143 | | | |
| 1,2,4-Trichlorobenzene | 112 | 15.0 | " | 100 | | 112 | 39-110 | | | Q-01 |
| *Surrogate: 2-FP* | *47.3* | | *"* | *50.0* | | *94.6* | *19-141* | | | |
| *Surrogate: Phenol-d6* | *48.8* | | *"* | *50.0* | | *97.6* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *44.6* | | *"* | *50.0* | | *89.2* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *52.8* | | *"* | *50.0* | | *106* | *33-108* | | | |
| *Surrogate: 2-FBP* | *50.4* | | *"* | *50.0* | | *101* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *53.2* | | *"* | *50.0* | | *106* | *48-149* | | | |
| **LCS Dup (0C06019-BSD1)** | | | | | | | | | | |
| Acenaphthene | 114 | 15.0 | mg/kg | 100 | | 114 | 48-110 | 0 | 19 | Q-01 |
| 4-Chloro-3-methylphenol | 235 | 15.0 | " | 200 | | 118 | 34-115 | 0.425 | 21 | Q-01 |
| 2-Chlorophenol | 203 | 15.0 | " | 200 | | 102 | 57-110 | 2.43 | 25 | |
| 1,4-Dichlorobenzene | 106 | 15.0 | " | 100 | | 106 | 39-110 | 4.61 | 34 | |
| 2,4-Dinitrotoluene | 97.9 | 75.0 | " | 100 | | 97.9 | 50-110 | 11.6 | 22 | |
| 4-Nitrophenol | 201 | 75.0 | " | 200 | | 101 | 26-116 | 4.85 | 31 | |
| N-Nitrosodi-n-propylamine | 115 | 15.0 | " | 100 | | 115 | 28-147 | 7.53 | 17 | |
| Pentachlorophenol | 195 | 75.0 | " | 200 | | 97.5 | 46-120 | 1.03 | 29 | |
| Phenol | 189 | 15.0 | " | 200 | | 94.5 | 35-110 | 0.531 | 27 | |
| Pyrene | 107 | 15.0 | " | 100 | | 107 | 35-143 | 0.939 | 31 | |

North Creek Analytical - Bothell

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541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C06019: Prepared 03/06/00 Using EPA 3580A** | | | | | | | | | | |
| **LCS Dup (0C06019-BSD1)** | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 111 | 15.0 | mg/kg | 100 | | 111 | 39-110 | 0.897 | 22 | Q-01 |
| *Surrogate: 2-FP* | *43.6* | | " | *50.0* | | *87.2* | *19-141* | | | |
| *Surrogate: Phenol-d6* | *48.4* | | " | *50.0* | | *96.8* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *45.0* | | " | *50.0* | | *90.0* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *52.3* | | " | *50.0* | | *105* | *33-108* | | | |
| *Surrogate: 2-FBP* | *51.2* | | " | *50.0* | | *102* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *54.8* | | " | *50.0* | | *110* | *48-149* | | | |
| **Batch 0C08003: Prepared 03/08/00 Using EPA 3520C/600 Series** | | | | | | | | | | |
| **Blank (0C08003-BLK1)** | | | | | | | | | | |
| 2,3,4,6-Tetrachlorophenol | ND | 10.0 | ug/l | | | | | | | |
| Acenaphthene | ND | 10.0 | " | | | | | | | |
| Acenaphthylene | ND | 10.0 | " | | | | | | | |
| Aniline | ND | 10.0 | " | | | | | | | |
| Anthracene | ND | 10.0 | " | | | | | | | |
| Benzoic Acid | ND | 10.0 | " | | | | | | | |
| Benzo (a) anthracene | ND | 10.0 | " | | | | | | | |
| Benzo (b) fluoranthene | ND | 10.0 | " | | | | | | | |
| Benzo (k) fluoranthene | ND | 10.0 | " | | | | | | | |
| Benzo (ghi) perylene | ND | 10.0 | " | | | | | | | |
| Benzo (a) pyrene | ND | 10.0 | " | | | | | | | |
| Benzyl alcohol | ND | 10.0 | " | | | | | | | |
| Bis(2-chloroethoxy)methane | ND | 10.0 | " | | | | | | | |
| Bis(2-chloroethyl)ether | ND | 10.0 | " | | | | | | | |
| Bis(2-chloroisopropyl)ether | ND | 10.0 | " | | | | | | | |
| Bis(2-ethylhexyl)phthalate | ND | 50.0 | " | | | | | | | |
| 4-Bromophenyl phenyl ether | ND | 10.0 | " | | | | | | | |
| Butyl benzyl phthalate | ND | 10.0 | " | | | | | | | |
| Carbazole | ND | 10.0 | " | | | | | | | |
| 4-Chloroaniline | ND | 10.0 | " | | | | | | | |
| 2-Chloronaphthalene | ND | 10.0 | " | | | | | | | |
| 4-Chloro-3-methylphenol | ND | 10.0 | " | | | | | | | |
| 2-Chlorophenol | ND | 10.0 | " | | | | | | | |
| 4-Chlorophenyl phenyl ether | ND | 10.0 | " | | | | | | | |
| Chrysene | ND | 10.0 | " | | | | | | | |

North Creek Analytical - Bothell

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541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: 0275-002-00<br>Project Manager: Sandra Smith | Reported:<br>03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C08003: Prepared 03/08/00 Using EPA 3520C/600 Series** | | | | | | | | | | |
| **Blank (0C08003-BLK1)** | | | | | | | | | | |
| Dibenz (a,h) anthracene | ND | 10.0 | ug/l | | | | | | | |
| Dibenzofuran | ND | 10.0 | " | | | | | | | |
| Di-n-butyl phthalate | ND | 10.0 | " | | | | | | | |
| 1,3-Dichlorobenzene | ND | 10.0 | " | | | | | | | |
| 1,4-Dichlorobenzene | ND | 10.0 | " | | | | | | | |
| 1,2-Dichlorobenzene | ND | 10.0 | " | | | | | | | |
| 3,3'-Dichlorobenzidine | ND | 10.0 | " | | | | | | | |
| 2,4-Dichlorophenol | ND | 10.0 | " | | | | | | | |
| Diethyl phthalate | ND | 10.0 | " | | | | | | | |
| 2,4-Dimethylphenol | ND | 10.0 | " | | | | | | | |
| Dimethyl phthalate | ND | 10.0 | " | | | | | | | |
| 4,6-Dinitro-2-methylphenol | ND | 10.0 | " | | | | | | | |
| 2,4-Dinitrophenol | ND | 20.0 | " | | | | | | | |
| 2,4-Dinitrotoluene | ND | 10.0 | " | | | | | | | |
| 2,6-Dinitrotoluene | ND | 10.0 | " | | | | | | | |
| Di-n-octyl phthalate | ND | 10.0 | " | | | | | | | |
| Fluoranthene | ND | 10.0 | " | | | | | | | |
| Fluorene | ND | 10.0 | " | | | | | | | |
| Hexachlorobenzene | ND | 10.0 | " | | | | | | | |
| Hexachlorobutadiene | ND | 10.0 | " | | | | | | | |
| Hexachlorocyclopentadiene | ND | 10.0 | " | | | | | | | |
| Hexachloroethane | ND | 10.0 | " | | | | | | | |
| Indeno (1,2,3-cd) pyrene | ND | 10.0 | " | | | | | | | |
| Isophorone | ND | 10.0 | " | | | | | | | |
| 2-Methylnaphthalene | ND | 10.0 | " | | | | | | | |
| 2-Methylphenol | ND | 10.0 | " | | | | | | | |
| 3 & 4-Methylphenol | ND | 10.0 | " | | | | | | | |
| Naphthalene | ND | 10.0 | " | | | | | | | |
| 2-Nitroaniline | ND | 10.0 | " | | | | | | | |
| 3-Nitroaniline | ND | 10.0 | " | | | | | | | |
| 4-Nitroaniline | ND | 10.0 | " | | | | | | | |
| Nitrobenzene | ND | 10.0 | " | | | | | | | |
| 2-Nitrophenol | ND | 10.0 | " | | | | | | | |
| 4-Nitrophenol | ND | 10.0 | " | | | | | | | |

North Creek Analytical - Bothell

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|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | Reported: 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C08003: Prepared 03/08/00 Using EPA 3520C/600 Series** | | | | | | | | | | |
| **Blank (0C08003-BLK1)** | | | | | | | | | | |
| N-Nitrosodiphenylamine | ND | 10.0 | ug/l | | | | | | | |
| N-Nitrosodi-n-propylamine | ND | 10.0 | " | | | | | | | |
| Pentachlorophenol | ND | 10.0 | " | | | | | | | |
| Phenanthrene | ND | 10.0 | " | | | | | | | |
| Phenol | ND | 10.0 | " | | | | | | | |
| Pyrene | ND | 10.0 | " | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 10.0 | " | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 10.0 | " | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 10.0 | " | | | | | | | |
| *Surrogate: 2-FP* | *25.1* | | " | *50.0* | | *50.2* | *40-115* | | | |
| *Surrogate: Phenol-d6* | *31.3* | | " | *50.0* | | *62.6* | *18-145* | | | |
| *Surrogate: 2,4,6-TBP* | *38.8* | | " | *50.0* | | *77.6* | *24-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *37.5* | | " | *50.0* | | *75.0* | *42-110* | | | |
| *Surrogate: 2-FBP* | *31.1* | | " | *50.0* | | *62.2* | *46-116* | | | |
| *Surrogate: p-Terphenyl-d14* | *43.9* | | " | *50.0* | | *87.8* | *63-117* | | | |
| **LCS (0C08003-BS1)** | | | | | | | | | | |
| Acenaphthene | 84.7 | 10.0 | ug/l | 100 | | 84.7 | 42-110 | | | |
| 4-Chloro-3-methylphenol | 212 | 10.0 | " | 200 | | 106 | 35-110 | | | |
| 2-Chlorophenol | 147 | 10.0 | " | 200 | | 73.5 | 45-110 | | | |
| 1,4-Dichlorobenzene | 65.2 | 10.0 | " | 100 | | 65.2 | 23-110 | | | |
| 2,4-Dinitrotoluene | 103 | 10.0 | " | 100 | | 103 | 51-110 | | | |
| 4-Nitrophenol | 149 | 10.0 | " | 200 | | 74.5 | 16-110 | | | |
| N-Nitrosodi-n-propylamine | 112 | 10.0 | " | 100 | | 112 | 34-115 | | | |
| Pentachlorophenol | 170 | 10.0 | " | 200 | | 85.0 | 30-124 | | | |
| Phenol | 152 | 10.0 | " | 200 | | 76.0 | 39-110 | | | |
| Pyrene | 95.4 | 10.0 | " | 100 | | 95.4 | 49-113 | | | |
| 1,2,4-Trichlorobenzene | 70.8 | 10.0 | " | 100 | | 70.8 | 17-110 | | | |
| *Surrogate: 2-FP* | *25.2* | | " | *50.0* | | *50.4* | *40-115* | | | |
| *Surrogate: Phenol-d6* | *36.6* | | " | *50.0* | | *73.2* | *18-145* | | | |
| *Surrogate: 2,4,6-TBP* | *40.8* | | " | *50.0* | | *81.6* | *24-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *37.9* | | " | *50.0* | | *75.8* | *42-110* | | | |
| *Surrogate: 2-FBP* | *33.8* | | " | *50.0* | | *67.6* | *46-116* | | | |
| *Surrogate: p-Terphenyl-d14* | *40.9* | | " | *50.0* | | *81.8* | *63-117* | | | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | Reported: |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/14/00 13:42 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C08003: Prepared 03/08/00 Using EPA 3520C/600 Series** | | | | | | | | | | |
| **LCS Dup (0C08003-BSD1)** | | | | | | | | | | |
| Acenaphthene | 81.3 | 10.0 | ug/l | 100 | | 81.3 | 42-110 | 4.10 | 23 | |
| 4-Chloro-3-methylphenol | 194 | 10.0 | " | 200 | | 97.0 | 35-110 | 8.87 | 25 | |
| 2-Chlorophenol | 138 | 10.0 | " | 200 | | 69.0 | 45-110 | 6.32 | 26 | |
| 1,4-Dichlorobenzene | 65.1 | 10.0 | " | 100 | | 65.1 | 23-110 | 0.153 | 35 | |
| 2,4-Dinitrotoluene | 99.8 | 10.0 | " | 100 | | 99.8 | 51-110 | 3.16 | 17 | |
| 4-Nitrophenol | 219 | 10.0 | " | 200 | | 110 | 16-110 | 38.0 | 20 | Q-07 |
| N-Nitrosodi-n-propylamine | 106 | 10.0 | " | 100 | | 106 | 34-115 | 5.50 | 26 | |
| Pentachlorophenol | 171 | 10.0 | " | 200 | | 85.5 | 30-124 | 0.587 | 31 | |
| Phenol | 138 | 10.0 | " | 200 | | 69.0 | 39-110 | 9.66 | 27 | |
| Pyrene | 90.2 | 10.0 | " | 100 | | 90.2 | 49-113 | 5.60 | 21 | |
| 1,2,4-Trichlorobenzene | 69.3 | 10.0 | " | 100 | | 69.3 | 17-110 | 2.14 | 36 | |
| *Surrogate: 2-FP* | *22.7* | | " | *50.0* | | *45.4* | *40-115* | | | |
| *Surrogate: Phenol-d6* | *33.0* | | " | *50.0* | | *66.0* | *18-145* | | | |
| *Surrogate: 2,4,6-TBP* | *37.5* | | " | *50.0* | | *75.0* | *24-130* | | | |
| *Surrogate: Nitrobenzene-d5* | *36.9* | | " | *50.0* | | *73.8* | *42-110* | | | |
| *Surrogate: 2-FBP* | *31.5* | | " | *50.0* | | *63.0* | *46-116* | | | |
| *Surrogate: p-Terphenyl-d14* | *39.2* | | " | *50.0* | | *78.4* | *63-117* | | | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: 0275-002-00 | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/14/00 13:42 |

## Notes and Definitions

| | |
|---|---|
| A-01 | Value should be taken as estimated. Sample matrix interferes with column and re-analysis is not possible. |
| Q-01 | The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch. |
| Q-07 | The RPD value for this QC sample is above the established control limit. Review of associated QC indicates the high RPD does not represent an out-of-control condition for the batch. |
| S-01 | The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences. |
| 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 |
| RPD | Relative Percent Difference |

North Creek Analytical - Bothell

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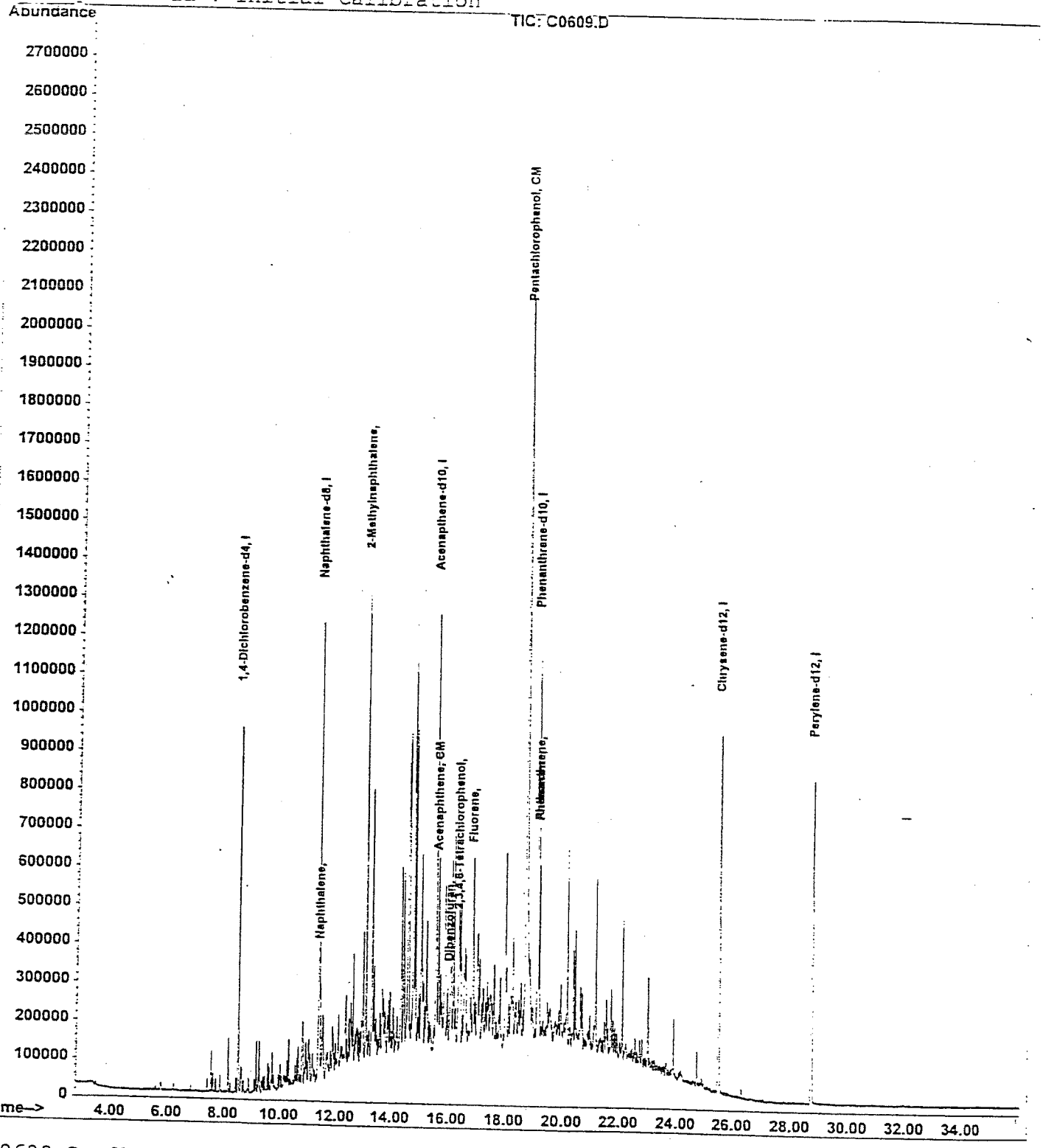
Data File : G:\MS-2DATA\030600\C0609.D
Acq On : 6 Mar 2000 8:29 pm
Sample : B0C0083-01
Misc : 25x 8270 OTHER WET
MS Integration Params: rteint.p
Quant Time: Mar 7 9:04 2000

Vial: 9
Operator: KN
Inst : MS-2
Multiplr: 1.00

Quant Results File: SVOA0002.RES

Method : F:\1\METHODS\SVOA0002.M (RTE Integrator)
Title : SVOCs by Method 8270C
Last Update : Mon Mar 06 16:02:55 2000
Response via : Initial Calibration

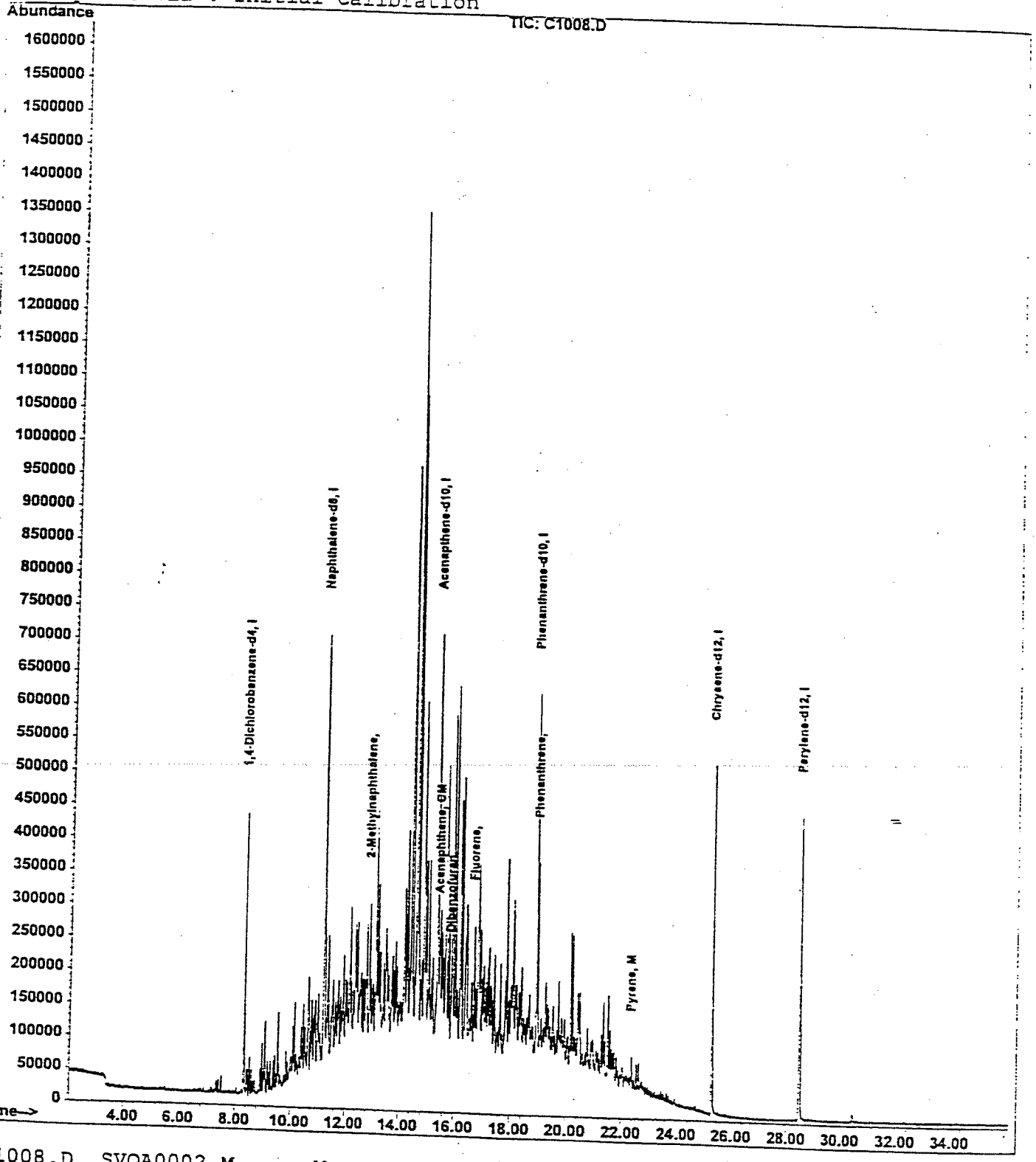


Data File : G:\MS-2DATA\031000\C1008.D
Acq On : 11 Mar 2000 12:13 am
Sample : B0C0083-02
Misc : 100x 8270 WATER
MS Integration Params: rteint.p
Quant Time: Mar 13 8:47 2000

Vial: 8
Operator: KN
Inst : MS-2
Multiplr: 1.00

Quant Results File: SVOA0002.RES

Method : F:\1\METHODS\SVOA0002.M (RTE Integrator)
Title : SVOCs by Method 8270C
Last Update : Thu Mar 09 13:15:54 2000
Response via : Initial Calibration



# CHAIN OF CUSTODY RECORD BOC0083

GEOENGINEERS, INC.
1101 FAWCETT, SUITE 200
TACOMA, WASHINGTON 98402
(206) 383-4940

Geo Engineers

DATE 3/3/00
PAGE 1 OF 1
LAB NCA
LAB NO.

PROJECT NAME/LOCATION Bellingham Wood Treat
PROJECT NUMBER 0275-002-00
PROJECT MANAGER Sandy Smith
SAMPLED BY Sandy Smith

| SAMPLE IDENTIFICATION | | SAMPLE COLLECTION | | | # OF | ANALYSIS REQUIRED | NOTES/COMMENTS (Preserved, filtered, etc.) |
|---|---|---|---|---|---|---|---|
| LAB | GEOENGINEERS | DATE | TIME | MATRIX | JARS | B270 Semis | |
| C0083-01 | BWT-TS-01 | 3/3/00 | 16:00 | oil | 4 | X | 2 day TAT |
| ↓ -02 | BWT-~~MW01~~ MW02 | 3/3/00 | 18:20 | oil/wat | 1 | | With Chromatogram |
| | | | | | | | Hold for Analyses |

| RELINQUISHED BY | FIRM | RELINQUISHED BY | FIRM | RELINQUISHED BY | FIRM |
|---|---|---|---|---|---|
| SIGNATURE Sandra B Smith | GE | SIGNATURE | | SIGNATURE | |
| PRINTED NAME Sandra B Smith | | PRINTED NAME | | PRINTED NAME | |
| DATE 3/3/00 | TIME 20:20 | DATE | TIME | DATE | TIME |
| **RECEIVED BY** | **FIRM** | **RECEIVED BY** | **FIRM** | **RECEIVED BY** | **FIRM** |
| SIGNATURE M. Herb Christ | NCA | SIGNATURE | | SIGNATURE | |
| PRINTED NAME | | PRINTED NAME | | PRINTED NAME | |
| DATE 3.3.00 | TIME 20:20 | DATE | TIME | DATE | TIME |

ADDITIONAL COMMENTS: Please hold sample remainder until further notice. Bottles VERY full

w/B 5.2

# SPECTRA Laboratories

2221 Ross Way • Tacoma, WA 98421 • (253) 272-4850


05/11/2000

North Creek Analytical
18939 120th Avenue NE
Bothell, WA 98011
Attn: Steve Davis

| | |
|---|---|
| Project: | B0D0387 |
| Client ID: | B0D0387-01 |
| Sample Matrix: | Water/Oil |
| Date Sampled: | 05/12/2000 |
| Date Received: | 05/10/2000 |
| Spectra Project: | 2000050093 |
| Spectra Number: | 1 |
| | Rush |

| Analyte | Result | Units | Method |
|---|---|---|---|
| Gravity, API at 60. Deg F | 23.4 | | ASTM D-287 |
| Gravity, Specific at 60 Deg. F | 0.9135 | | ASTM D287 |
| Kinematic Viscosity at 40 Deg. | 2.46 | cSt | ASTM D-445 |

SPECTRA LABORATORIES

Steven G. Hibbs, Laboratory Manager
a6/mlh

nca™
North Creek Analytical, Inc.
Environmental Laboratory Network
www.ncalabs.com

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 98206-4776 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210
20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

# CHAIN OF CUSTODY REPORT

**Work Order #:** B0D0387

CLIENT: GEOENGINEERS
REPORT TO: SANDY SMITH
ADDRESS: GEI TACOMA
PHONE: 425 861-6107 FAX:

INVOICE TO:
P.O. NUMBER:

PROJECT NAME: DOUGLAS MANAGEMENT HALEY SITE
PROJECT NUMBER: 0275-002-00
SAMPLED BY: D BAUMGARTEN

TURNAROUND REQUEST in Business Days*
Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1
STD. Petroleum Hydrocarbon Analyses: 5 | 4 | 3 | 2 | 1 | <1
STD. OTHER Please Specify
*Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | REQUESTED ANALYSES | MATRIX (W, S, O) | # OF CONT. | COMMENTS | NCA WO ID |
|---|---|---|---|---|---|---|---|
| 1. | TL-MW-4-P01 | 4/20/00 1430 | | O | 1 | HOLD | -01 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| 11. | | | | | | | |
| 12. | | | | | | | |
| 13. | | | | | | | |
| 14. | | | | | | | |
| 15. | | | | | | | |

RELINQUISHED BY: DATE: 4/20/00
PRINT NAME: D BAUMGARTEN FIRM: GEI TIME: 1715
RECEIVED BY: PRINT NAME: FIRM: NCA DATE: 4/24/00 TIME: 1728
RELINQUISHED BY: PRINT NAME: FIRM: DATE: TIME:
RECEIVED BY: PRINT NAME: FIRM: DATE: TIME:

ADDITIONAL REMARKS: PRODUCT SAMPLE!!

COC REV 3/99

TEMP: 0.8 °C

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/10/00 |
| Date Analyzed: | 5/11/00 |
| % Solids | 83.4 |
| Dilution Factor | 5 |

**8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modified**

| | | | Recovery Limits | |
|---|---|---|---|---|
| **Surrogate** | **% Recovery** | **Flags** | **Low** | **High** |
| Dibromofluoromethane | 97.1 | | 85 | 120 |
| Fluorobenzene | 91.4 | | 86 | 115 |
| Toluene-d8 | 94.5 | | 85 | 113 |
| Ethylbenzene-d10 | 94.9 | | 75 | 113 |
| Bromofluorobenzene | 97.5 | | 79 | 120 |

Sample results are on a dry weight basis.

| **Analyte** | **Result (ug/kg)** | **PQL** | **MDL** | **Flags** |
|---|---|---|---|---|
| Chloromethane | ND | 2300 | 220 | |
| Bromomethane | ND | 2300 | 140 | |
| Vinyl Chloride | ND | 2300 | 130 | |
| Chloroethane | ND | 2300 | 100 | |
| Trichlorofluoromethane | ND | 2300 | 140 | |
| 1,1-Dichloroethene | ND | 2300 | 250 | |
| Methylene Chloride | ND | 2300 | 280 | |
| trans-1,2-Dichloroethene | ND | 2300 | 250 | |
| 1,1-Dichloroethane | ND | 2300 | 290 | |
| cis-1,2-Dichloroethene | ND | 2300 | 260 | |
| Chloroform | ND | 2300 | 250 | |
| 1,1,1-Trichloroethane | ND | 2300 | 240 | |
| Carbon Tetrachloride | ND | 2300 | 230 | |
| 1,2-Dichloroethane | ND | 2300 | 280 | |
| Trichloroethene | ND | 2300 | 220 | |
| 1,2-Dichloropropane | ND | 2300 | 210 | |
| Bromodichloromethane | ND | 2300 | 230 | |
| cis-1,3-Dichloropropene | ND | 2300 | 240 | |
| trans-1,3-Dichloropropene | ND | 2300 | 250 | |
| 1,1,2-Trichloroethane | ND | 2300 | 260 | |
| Tetrachloroethene | ND | 2300 | 170 | |
| Dibromochloromethane | ND | 2300 | 270 | |
| Chlorobenzene | ND | 2300 | 220 | |
| Bromoform | ND | 2300 | 300 | |
| 1,1,2,2-Tetrachloroethane | ND | 2300 | 390 | |
| 1,3-Dichlorobenzene | ND | 2300 | 240 | |

# SOUND ANALYTICAL SERVICES, INC.

8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modified data for 89402-01 continued...

| Analyte | Result (ug/kg) | PQL | MDL |
|---|---|---|---|
| 1,4-Dichlorobenzene | ND | 2300 | 260 |
| 1,2-Dichlorobenzene | ND | 2300 | 250 |

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/10/00 |
| Date Analyzed: | 5/11/00 |
| % Solids | 83.4 |
| Dilution Factor | 5 |

**ntatively Identified 8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modifi**

Sample results are on a dry weight basis.

| TIC Name | Result (ug/kg) | Ret. Time (Min.) | Flags |
|---|---|---|---|
| 1-Ethyl-3-methylcyclohexane (c,t) | 1400 | 15.31 | J |
| Benzene, 1-ethyl-2-methyl | 3200 | 17.12 | J |
| Benzene, 1-ethyl-3-methyl | 3700 | 18.78 | J |
| Benzene, 2-propenyl- | 2000 | 19.13 | J |
| Benzene, 1-methyl-3-propyl- | 3900 | 19.25 | J |
| Benzene, 1-methyl-2-propyl- | 1800 | 19.73 | J |
| Benzene, 1-methyl-3-(1-methylethyl) | 6900 | 19.95 | J |
| Benzene, 1-ethyl-2,3-dimethyl- | 5800 | 20.13 | J |
| 2,3-Dihydro-1-methylindene | 1700 | 20.28 | J |
| 2-Ethyl-2-methyl-1,3-dithiolane | 2200 | 20.42 | J |
| Benzene, 1,2,4,5-tetramethyl- | 3200 | 20.66 | J |
| Benzene, 1,2,3,5-tetramethyl- | 4600 | 20.88 | J |
| Benzene, 1,2,3,4-tetramethyl- | 4600 | 20.95 | J |
| Benzene, (1,1-dimethylpropyl)- | 1800 | 21.13 | J |
| Indan, 1-methyl- | 5100 | 21.39 | J |
| 1H-Indene, 2,3-dihydro-5-methyl- | 7500 | 21.66 | J |
| 2-tert-Butyltoluene | 1900 | 21.77 | J |
| Benzene, 4-ethyl-1,2-dimethyl- | 3100 | 21.92 | J |
| 1H-Indene, 2,3-dihydro-1,6-dimethyl | 6300 | 22.23 | J |
| Benzene, ethyl-1,2,4-trimethyl- | 2900 | 22.34 | J |

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/8/00 |
| Date Analyzed: | 5/9/00 |
| % Solids | |
| Dilution Factor | 20 |

**8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modified**

| | | | Recovery Limits | |
|---|---|---|---|---|
| **Surrogate** | **% Recovery** | **Flags** | **Low** | **High** |
| Dibromofluoromethane | 82.9 | X9 | 85 | 120 |
| Fluorobenzene | 85.9 | X9 | 86 | 115 |
| Toluene-d8 | 114 | X9 | 85 | 113 |
| Ethylbenzene-d10 | 102 | | 75 | 113 |
| Bromofluorobenzene | 156 | X9 | 79 | 120 |

Sample results are on an as received basis.

| **Analyte** | **Result (ug/kg)** | **PQL** | **MDL** | **Flags** |
|---|---|---|---|---|
| Chloromethane | ND | 8000 | 770 | |
| Bromomethane | ND | 8000 | 470 | |
| Vinyl Chloride | ND | 8000 | 430 | |
| Chloroethane | ND | 8000 | 350 | |
| Trichlorofluoromethane | ND | 8000 | 480 | |
| 1,1-Dichloroethene | ND | 8000 | 850 | |
| Methylene Chloride | ND | 8000 | 940 | |
| trans-1,2-Dichloroethene | ND | 8000 | 850 | |
| 1,1-Dichloroethane | ND | 8000 | 980 | |
| cis-1,2-Dichloroethene | ND | 8000 | 880 | |
| Chloroform | ND | 8000 | 850 | |
| 1,1,1-Trichloroethane | ND | 8000 | 830 | |
| Carbon Tetrachloride | ND | 8000 | 800 | |
| 1,2-Dichloroethane | ND | 8000 | 970 | |
| Trichloroethene | ND | 8000 | 760 | |
| 1,2-Dichloropropane | ND | 8000 | 730 | |
| Bromodichloromethane | ND | 8000 | 780 | |
| cis-1,3-Dichloropropene | ND | 8000 | 810 | |
| trans-1,3-Dichloropropene | ND | 8000 | 860 | |
| 1,1,2-Trichloroethane | ND | 8000 | 900 | |
| Tetrachloroethene | ND | 8000 | 600 | |
| Dibromochloromethane | ND | 8000 | 930 | |
| Chlorobenzene | ND | 8000 | 750 | |
| Bromoform | ND | 8000 | 1000 | |
| 1,1,2,2-Tetrachloroethane | ND | 8000 | 1300 | |
| 1,3-Dichlorobenzene | ND | 8000 | 830 | |

# SOUND ANALYTICAL SERVICES, INC.

8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modified data for 89402-02 continued...

| Analyte | Result (ug/kg) | PQL | MDL |
|---|---|---|---|
| 1,4-Dichlorobenzene | ND | 8000 | 890 |
| 1,2-Dichlorobenzene | ND | 8000 | 870 |

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/8/00 |
| Date Analyzed: | 5/9/00 |
| % Solids | |
| Dilution Factor | 20 |

**ntatively Identified 8010 Halogenated Volatile Organics by USEPA Method 5030/8260B Modifi**

Sample results are on an as received basis.

| TIC Name | Result (ug/kg) | Ret. Time (Min.) | Flags |
|---|---|---|---|
| Cyclopentane, 1,2-dimethyl, cis- | 15000 | 8.46 | J |
| Cyclohexane, methyl- | 46000 | 9.67 | J |
| Unknown Aldehyde | 13000 | 11.02 | J |
| Unkown | 13000 | 11.27 | J |
| Cyclohexane, 1,2-dimethyl, trans- | 12000 | 12.11 | J |
| Cyclohexane, ethyl- | 25000 | 13.19 | J |
| Unknown | 12000 | 13.96 | J |
| cis-1-Ethyl-3-methyl-cyclohexane | 16000 | 15.33 | J |
| Benzene, (1-methylpropyl)- | 13000 | 18.34 | J |
| Benzene, 1-methyl-2-(1-methylethyl) | 40000 | 18.65 | J |
| Benzene, 1,2,3-trimethyl | 25000 | 18.82 | J |
| Indane | 21000 | 19.14 | J |
| Benzene, 1-methyl-3-propyl | 17000 | 19.27 | J |
| Benzene, 1-methyl-3-(1-methylethyl) | 32000 | 19.97 | J |
| Benzene, 4-ethyl-1,2-dimethyl- | 23000 | 20.15 | J |
| Benzene, 1-ethyl-2,3-dimethyl- | 13000 | 20.70 | J |
| Benzene, 1,2,3,4-tetramethyl- | 17000 | 20.90 | J |
| Benzene, 1,2,4,5-tetramethyl- | 17000 | 20.99 | J |
| 1H-Indene, 2,3-dihydro-4-methyl- | 30000 | 21.43 | J |
| 1H-Indene, 2,3-dihydro-5-methyl- | 32000 | 21.68 | J |

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/5/00 |
| Date Analyzed: | 5/5/00 |
| % Solids | |
| Dilution Factor | 100 |

**Semivolatile Organics by USEPA Method 8270**

| Surrogate | % Recovery | Flags | Recovery Limits Low | Recovery Limits High |
|---|---|---|---|---|
| Nitrobenzene - d5 | 74 | | 44 | 153 |
| 2 - Fluorobiphenyl | 44 | X9 | 50 | 129 |
| p - Terphenyl - d14 | 58 | | 37 | 135 |
| Phenol - d5 | 9 | X9 | 48 | 130 |
| 2 - Fluorophenol | 73 | | 53 | 141 |
| 2,4,6 - Tribromophenol | 20 | X9 | 55 | 137 |

Sample results are on an as received basis.

| Analyte | Result (ug/kg) | PQL | MDL | Flags |
|---|---|---|---|---|
| Phenol | ND | 4300 | 1600 | |
| bis(2-Chloroethyl)ether | ND | 4300 | 920 | |
| 2-Chlorophenol | ND | 4300 | 990 | |
| 1,3-Dichlorobenzene | ND | 4300 | 1200 | |
| 1,4-Dichlorobenzene | ND | 4300 | 1000 | |
| Benzyl Alcohol | ND | 4300 | 1300 | |
| 1,2-Dichlorobenzene | ND | 4300 | 870 | |
| 2-Methylphenol | ND | 4300 | 650 | |
| bis(2-Chloroisopropyl)ether | ND | 4300 | 1200 | |
| 3- & 4-Methylphenol | ND | 4300 | 1100 | |
| N-nitroso-di-n-propylamine | ND | 4300 | 1000 | |
| Hexachloroethane | ND | 4300 | 1300 | |
| Nitrobenzene | ND | 4300 | 710 | |
| Isophorone | ND | 4300 | 1200 | |
| 2-Nitrophenol | ND | 4300 | 780 | |
| 2,4-Dimethylphenol | ND | 4300 | 1100 | |
| Benzoic Acid | ND | 4300 | 490 | |
| bis(2-Chloroethoxy)methane | ND | 4300 | 800 | |
| 2,4-Dichlorophenol | ND | 4300 | 320 | |
| 1,2,4-Trichlorobenzene | ND | 4300 | 580 | |
| Naphthalene | 2800000 | 870 | 860 | D10 |
| 4-Chloroaniline | ND | 4300 | 680 | |
| Hexachlorobutadiene | ND | 4300 | 940 | |
| 4-Chloro-3-methylphenol | ND | 4300 | 1300 | |
| 2-Methylnaphthalene | 25000000 J | 870 | 620 | D100 |
| Hexachlorocyclopentadiene | ND | 4300 | 670 | |

# SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 89402-02 continued...

| Analyte | Result (ug/kg) | PQL | MDL | |
|---|---|---|---|---|
| 2,4,6-Trichlorophenol | ND | 4300 | 750 | R |
| 2,4,5-Trichlorophenol | ND | 4300 | 850 | |
| 2-Chloronaphthalene | | 1700 | 990 | |
| 2-Nitroaniline | ND | 4300 | 980 | |
| Dimethylphthalate | ND | 4300 | 550 | |
| Acenaphthylene | ND | 870 | 690 | |
| 2,6-Dinitrotoluene | ND | 4300 | 1400 | |
| 3-Nitroaniline | ND | 4300 | 1200 | |
| Acenaphthene | | 870 | 830 | D 10 |
| 2,4-Dinitrophenol | ND | 4300 | 890 | R |
| 4-Nitrophenol | ND | 4300 | 1700 | |
| Dibenzofuran | ND | 4300 | 600 | |
| 2,4-Dinitrotoluene | ND | 4300 | 790 | |
| Diethylphthalate | ND | 4300 | 1300 | |
| 4-Chlorophenylphenylether | ND | 4300 | 760 | |
| Fluorene | | 870 | 720 | D10 |
| 4-Nitroaniline | ND | 4300 | 500 | |
| 4,6-Dinitro-2-methylphenol | ND | 4300 | 760 | R |
| N-Nitrosodiphenylamine | ND | 4300 | 490 | |
| 4-Bromophenylphenylether | ND | 4300 | 860 | |
| Hexachlorobenzene | ND | 4300 | 1600 | R |
| Pentachlorophenol | ND | 4300 | 1000 | |
| Phenanthrene | | 870 | 660 | D100 |
| Anthracene | | 870 | 850 | D10 |
| Fluoranthene | | 870 | 600 | |
| Pyrene | | 870 | 480 | |
| Butylbenzylphthalate | ND | 4300 | 650 | |
| 3,3'-Dichlorobenzidine | | 4300 | 1300 | |
| Benzo(a)anthracene | | 870 | 870 | |
| Chrysene | ND | 870 | 870 | |
| bis(2-Ethylhexyl)phthalate | ND | 8700 | 8000 | |
| Di-n-octylphthalate | | 4300 | 900 | |
| Benzo(b)flouranthene | | 870 | 860 | |
| Benzo(k)fluoranthene | | 870 | 600 | |
| Benzo(a)pyrene | | 870 | 810 | |
| Indeno(1,2,3-cd)pyrene | | 870 | 850 | |
| Dibenz(a,h)anthracene | | 870 | 810 | |
| Benzo(g,h,i)perylene | | 870 | 770 | |
| Dibenzo(a,j)acridine | ND | 870 | 870 | |
| Dibenzo(a,e)pyrene | | 870 | 870 | |
| Dibenzo(a,h)pyrene | | 870 | 870 | |
| Dibenzo(a,i)pyrene | | 870 | 870 | |
| Dibenzo(a,l)pyrene | ND | 870 | 870 | |

71000 J

41000 J

Non-reporting di-n-butylphthalate result → NON DETECT BASED ON RAW DATA. -EMW 6-20-00

6-19-00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/5/00 |
| Date Analyzed: | 5/5/00 |
| % Solids | |
| Dilution Factor | 100 |

**Tentatively Identified Compounds - USEPA Method 8270C**

Sample results are on an as received basis.

| TIC Name | Result (ug/kg) | Ret. Time (Min.) | Flags |
|---|---|---|---|
| Benzene, 1,3,5-trimethyl- | 1000000 | 4.26 | J |
| Benzene, 1,3,5-trimethyl- | 2700000 | 4.65 | J |
| Benzene, 1,2-diethyl- | 1700000 | 5.01 | J |
| Benzene, 1,2,3,5-tetramethyl- | 2000000 | 5.09 | J |
| Indane | 610000 | 5.16 | J |
| Benzene, 1,2,3,5-tetramethyl- | 2300000 | 5.51 | J |
| Benzene, 1,2,3,5-tetramethyl- | 2300000 | 5.71 | J |
| 1,3,8-p-Menthatriene | 1100000 | 5.75 | J |
| Benzofuran, 2,3-dihydro-2-methyl- | 3200000 | 5.82 | J |
| Benzene, diethylmethyl- | 710000 | 6 | J |
| Benzofuran, 2,3-dihydro-2-methyl- | 1200000 | 6.16 | J |
| Benzofuran, 2,3-dihydro-2-methyl- | 1000000 | 6.2 | J |
| Benzene, 1-ethenyl-3,5-dimethyl- | 560000 | 6.38 | J |
| 4a,8a-Ethenonaphthalene, 1,2,3,4,5,8-hexahydro- | 1500000 | 6.47 | J |
| 6-Methyl-4-indanol | 1700000 | 6.94 | J |
| Benzene, 2-ethenyl-1,3,5-trimethyl- | 940000 | 7.53 | J |
| Naphthalene, 1,8-dimethyl- | 1600000 | 8.62 | J |
| Phenanthrene, 1-methyl- | 1100000 | 11.67 | J |
| 9H-Fluorene, 9-ethylidene- | 1200000 | 11.71 | J |
| Phenanthrene, 2,3,5-trimethyl- | 720000 | 12.91 | J |

6/19/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/5/00 |
| Date Analyzed: | 5/5/00 |
| % Solids | 83.4 |
| Dilution Factor | 20 |

**Semivolatile Organics by USEPA Method 8270**

| Surrogate | % Recovery | Flags | Recovery Limits Low | Recovery Limits High |
|---|---|---|---|---|
| Nitrobenzene - d5 | 229 | X9 | 44 | 153 |
| 2 - Fluorobiphenyl | 51.2 | | 50 | 129 |
| p - Terphenyl - d14 | 84.8 | | 37 | 135 |
| Phenol - d5 | 60.6 | | 48 | 130 |
| 2 - Fluorophenol | 92.4 | | 53 | 141 |
| 2,4,6 - Tribromophenol | 14.8 | X9 | 55 | 137 |

Sample results are on a dry weight basis.

| Analyte | Result (ug/kg) | PQL | MDL | Flags |
|---|---|---|---|---|
| Phenol | ND | 99 | 14 | |
| bis(2-Chloroethyl)ether | ND | 99 | 35 | |
| 2-Chlorophenol | ND | 99 | 18 | |
| 1,3-Dichlorobenzene | ND | 99 | 12 | |
| 1,4-Dichlorobenzene | ND | 99 | 28 | |
| Benzyl Alcohol | ND | 99 | 19 | |
| 1,2-Dichlorobenzene | ND | 99 | 25 | |
| 2-Methylphenol | ND | 99 | 23 | |
| bis(2-Chloroisopropyl)ether | ND | 99 | 41 | |
| 3- & 4-Methylphenol | ND | 99 | 21 | |
| N-nitroso-di-n-propylamine | ND | 99 | 16 | |
| Hexachloroethane | ND | 99 | 26 | |
| Nitrobenzene | ND | 99 | 18 | |
| Isophorone | ND | 99 | 26 | |
| 2-Nitrophenol | ND | 99 | 22 | |
| 2,4-Dimethylphenol | ND | 99 | 14 | |
| Benzoic Acid | ND | 200 | 150 | |
| bis(2-Chloroethoxy)methane | ND | 99 | 31 | |
| 2,4-Dichlorophenol | ND | 99 | 21 | |
| 1,2,4-Trichlorobenzene | ND | 99 | 10 | |
| Naphthalene | 17000 | 20 | 9.9 | D10 |
| 4-Chloroaniline | ND | 99 | 8.6 | |
| Hexachlorobutadiene | ND | 99 | 17 | |
| 4-Chloro-3-methylphenol | ND | 99 | 10 | |
| 2-Methylnaphthalene | 200000 | 20 | 16 | D100 |
| Hexachlorocyclopentadiene | ND | 99 | 26 | |

6/19/00

# SOUND ANALYTICAL SERVICES, INC.

Semivolatile Organics by USEPA Method 8270 data for 89402-01 continued...

| Analyte | Result (ug/kg) | PQL | MDL | |
|---|---|---|---|---|
| 2,4,6-Trichlorophenol | ND | 99 | 17 | |
| 2,4,5-Trichlorophenol | ND | 99 | 19 | |
| 2-Chloronaphthalene | ND | 40 | 22 | |
| 2-Nitroaniline | ND | 99 | 22 | |
| Dimethylphthalate | ND | 99 | 12 | |
| Acenaphthylene | ND | 20 | 16 | |
| 2,6-Dinitrotoluene | ND | 99 | 32 | |
| 3-Nitroaniline | ND | 99 | 27 | |
| Acenaphthene | 7000 | 20 | 19 | D10 |
| 2,4-Dinitrophenol | ND | 99 | 20 | |
| 4-Nitrophenol | ND | 99 | 39 | |
| Dibenzofuran | ND | 99 | 14 | |
| 2,4-Dinitrotoluene | ND | 99 | 18 | |
| Diethylphthalate | ND | 99 | 29 | |
| 4-Chlorophenylphenylether | ND | 99 | 17 | |
| Fluorene | 9600 | 20 | 16 | D10 |
| 4-Nitroaniline | ND | 99 | 11 | |
| 4,6-Dinitro-2-methylphenol | ND | 99 | 17 | |
| N-Nitrosodiphenylamine | ND | 99 | 11 | |
| 4-Bromophenylphenylether | ND | 99 | 20 | |
| Hexachlorobenzene | ND | 99 | 36 | |
| Pentachlorophenol | ND | 99 | 23 | |
| Phenanthrene | 22000 | 20 | 15 | D10 |
| Anthracene | 4100 | 20 | 19 | |
| Di-n-butylphthalate | ND | 99 | 31 | |
| Fluoranthene | 11000 | 20 | 14 | D10 |
| Pyrene | 12000 | 20 | 11 | D10 |
| Butylbenzylphthalate | ND | 99 | 15 | |
| 3,3'-Dichlorobenzidine | ND | 99 | 29 | |
| Benzo(a)anthracene | 5600 | 20 | 20 | D10 |
| Chrysene | 5300 | 20 | 20 | D10 |
| bis(2-Ethylhexyl)phthalate | ND | 200 | 180 | |
| Di-n-octylphthalate | ND | 99 | 20 | |
| Benzo(k)fluoranthene | 2400 | 20 | 14 | |
| Benzo(a)pyrene | 6000 | 20 | 18 | D10 |
| Indeno(1,2,3-cd)pyrene | 2600 | 20 | 19 | |
| Dibenz(a,h)anthracene | 350 | 20 | 18 | |
| Benzo(g,h,i)perylene | 2700 | 20 | 18 | |
| Dibenzo(a,j)acridine | 99 | 20 | 20 | |
| Dibenzo(a,e)pyrene | 2000 | 20 | 20 | |
| Dibenzo(a,h)pyrene | ND | 20 | 20 | |
| Dibenzo(a,i)pyrene | 1400 | 20 | 20 | |
| Dibenzo(a,l)pyrene | 450 | 20 | 20 | |

6/19/08

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/5/00 |
| Date Analyzed: | 5/5/00 |
| % Solids | 83.4 |
| Dilution Factor | 20 |

**Tentatively Identified Compounds - USEPA Method 8270C**

Sample results are on a dry weight basis.

| TIC Name | Result (ug/kg) | Ret. Time (Min.) | Flags |
|---|---|---|---|
| Benzene, 1,2,3-trimethyl- | 12000 | 4.25 | J |
| Benzene, 1,2-diethyl- | 19000 | 4.99 | J |
| Benzene, 1,2,3,4-tetramethyl- | 19000 | 5.07 | J |
| Benzene, 1-methyl-2-propyl- | 15000 | 5.4 | J |
| Benzene, 1,2,3,5-tetramethyl- | 33000 | 5.49 | J |
| Benzene, 1,2,3,5-tetramethyl- | 22000 | 5.69 | J |
| 1,3,8-p-Menthatriene | 18000 | 5.73 | J |
| Benzene, 1,3-diethyl-5-methyl- | 5900 | 5.99 | J |
| Benzofuran, 2,3-dihydro-2-methyl- | 8500 | 6.13 | J |
| Benzene, 1,2,3,5-tetramethyl- | 9600 | 6.18 | J |
| 1H-Indene, 2,3-dihydro-5-methyl- | 6100 | 6.36 | J |
| Benzene, 1,4-diethyl-2-methyl- | 2300 | 6.4 | J |
| 1H-Indene, 2,3-dihydro-5-methyl- | 9900 | 6.45 | J |
| 1H-Indene, 2,3-dihydro-1,2-dimethyl- | 15000 | 6.91 | J |
| Naphthalene, 2,3-dimethyl- | 43000 | 8.9 | J |
| Naphthalene, 1,4,6-trimethyl- | 32000 | 9.32 | J |
| Anthracene, 9-methyl- | 11000 | 11.66 | J |
| 5H-Dibenzo[a,d]cyclohepten-5-ol, 10,11-dihydro- | 7300 | 11.78 | J |
| Benzo[c]phenanthrene | 1700 | 14.37 | J |
| Triphenylene, 2-methyl- | 400 | 14.77 | J |

6/19/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/4/00 |
| Date Analyzed: | 5/4/00 |
| % Solids | 83.4 |
| Dilution Factor | 20 |

**Diesel and Motor Oil by NWTPH-Dx Modified**

| Surrogate | % Recovery | Flags | Recovery Limits Low | Recovery Limits High |
|---|---|---|---|---|
| o-terphenyl | 76.7 | | 50 | 150 |

Sample results are on a dry weight basis.

| Analyte | Result (mg/kg) | PQL | MDL | Flags |
|---|---|---|---|---|
| #2 Diesel | 6300 | 120 | 74 | X1 |
| Motor Oil | 710 | 240 | 120 | |

X1 - Chromatogram suggests this might be jet fuel, kerosene or similar product

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/10/00 |
| Date Analyzed: | 5/10/00 |
| Dilution Factor | 5 |

**Metals by ICP-MS - USEPA Method 6020**

Sample results are on an as received basis.

| Analyte | Result (mg/kg) | PQL | MDL | Flags |
|---|---|---|---|---|
| Arsenic | 0.22 | 1.1 | 0.083 | ~~J~~ J4 |
| Barium | 0.77 | 1.1 | 0.055 | ~~J~~ |
| Cadmium | ND | 0.55 | 0.029 | |
| Chromium | 5.1 | 1.1 | 0.02 | |
| Lead | 0.94 | 0.55 | 0.0039 | PBW |
| Selenium | 0.65 | 3.3 | 0.38 | ~~J B1~~ ~~J~~ U1 |
| Silver | 0.061 | 0.55 | 0.0078 | ~~J B1~~ U1 |

PBW 6/20/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | TL-MW-4-P01 |
| Lab ID: | 89402-02 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/8/00 |
| Date Analyzed: | 5/9/00 |
| Dilution Factor | 1 |
| % Solids | 100 |

**Mercury by CVAA - USEPA Method 7471**

Sample results are on a dry weight basis.

| Analyte | Result (mg/kg) | PQL | MDL | Flags |
|---|---|---|---|---|
| Mercury | ND | 0.065 | 0.056 | R 2 |

PBO

6/20/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| **Client Name** | GeoEngineers, Inc. |
| **Project Name** | FORMER HALEY SITE |
| **Date Received** | 05-03-00 |

**Sample Preparation Information for Toxicity Characteristic Leaching Procedure (TCLP) EPA Method 1311**

| | |
|---|---|
| **Client Sample ID** | HS-SSP-S01 |
| **Lab ID** | 89402-01 |

| | |
|---|---|
| % Solids: | 100 |
| No. of Extractions: | 1 |
| Type of Extraction(s): | Rotary |
| Extraction Fluid: | #1 |
| Date Filtered: | 05-12-00 |

8/20/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/12/00 |
| Date Analyzed: | 5/12/00 |
| Dilution Factor | 1 |

**TCLP Metals by ICP - USEPA Method 6010**

| Analyte | Result (mg/L) | PQL | Flags |
|---|---|---|---|
| Arsenic | 0.012 | 0.01 | |
| Barium | 0.54 | 0.005 | |
| Cadmium | ND | 0.005 | |
| Chromium | ND | 0.01 | |
| Lead | 0.013 | 0.01 | |
| Selenium | ND | 0.05 | |
| Silver | ND | 0.01 | |

6/20/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| Client Name | GeoEngineers, Inc. |
| Client ID: | HS-SSP-S01 |
| Lab ID: | 89402-01 |
| Date Received: | 5/3/00 |
| Date Prepared: | 5/12/00 |
| Date Analyzed: | 5/12/00 |
| Dilution Factor | 1 |

**TCLP Mercury by CVAA - USEPA Method 7470**

| Analyte | Result (mg/L) | PQL | MDL | Flags |
|---|---|---|---|---|
| Mercury | ND | 0.002 | 0.0017 | |

6/20/00

# SOUND ANALYTICAL SERVICES, INC.

| | |
|---|---|
| **Client Name** | GeoEngineers, Inc. |
| **Project Name** | FORMER HALEY SITE |
| **Date Received** | 05-03-00 |

General Chemistry Parameters

| **Client Sample ID** | | | HS-SSP-S01 | | |
|---|---|---|---|---|---|
| **Lab ID** | | | 89402-01 | | |
| **Parameter** | **Method** | **Date Analyzed** | **Units** | **Result** | **PQL** |
| Flash Point | EPA 1020 | 05-09-00 | °F | > 200 | N/A |
| pH | EPA 9045 | 05-08-00 | N/A | 7.86 | N/A |

| **Client Sample ID** | | | TL-MW-4-P01 | | |
|---|---|---|---|---|---|
| **Lab ID** | | | 89402-02 | | |
| **Parameter** | **Method** | **Date Analyzed** | **Units** | **Result** | **PQL** |
| Flash Point | EPA 1010 | 05-09-00 | °F | 158 | N/A |
| pH | EPA 9045 | 05-08-00 | N/A | 5.51 | N/A |

6/20/00

Quanterra
880 Riverside Parkway
West Sacramento, California 95605-1500

916 373-5600 Telephone
916 372-1059 Fax

May 15, 2000

QUANTERRA INCORPORATED PROJECT NUMBER: G0D260236
PO/CONTRACT: 0275-002-00

Sandy Smith
GeoEngineers Inc
1101 Fawcett
Suite 200
Tocoma, WA 98402

Dear Ms. Smith,

This report contains the analytical results for the samples received under chain of custody by Quanterra Incorporated on 4/22/00. These samples are associated with your Former Haley Site/Bellingham project.

All applicable quality control procedures met method-specified acceptance criteria, except as noted on the following page.

If you have any questions, please feel free to call me at (916)374-4358.

Sincerely,

Terry A. Wilson
Project Manager

Quanterra

# CASE NARRATIVE

## QUANTERRA INCORPORATED PROJECT NUMBER G0D260236

SOLID, 8290, Dioxins/Furans, HRGC/HRMS
Your soil samples have some analytes reported from the analysis of diluted sample extracts due to saturation. The analytes reported from the analysis of dilutions are as follows:
Sample "HS-MW-3-6.5'": 20X dilution for OCDD.
Sample "HS-MW-4-7'": 50X dilution for HpCDD, OCDF and OCDD.
Sample "TL-MW-2-9'": 100X dilution for HxCDF Totals, HpCDF, HpCDD, OCDF and OCDD.
Sample "TL-MW-5-9'": 50X dilution for OCDD.
Sample "HS-SSP-S01": 50X dilution for HpCDF, HpCDD, OCDF and OCDD.

Samples "TL-MW-2-9'" and "HS-SSP-S01" are still saturated with OCDD in the dilution analyses. These analytes are flagged with an "E" qualifier and should be considiered as estimated.

WASTE, 8290, Dioxins/Furans, HRGC/HRMS
The data for your oil sample is reported from the analysis of 50X dilution, of the sample extract, due to saturation in the undiluted analysis. The diluted data is still saturated with OCDD. This analyte is flagged with an "E" qualifier and the result may have a low bias.

There were no other anomalies associated with this project.

Quanterra

*Quanterra - Western Region*

## Quality Control Definitions

| QC Parameter | Definition |
|---|---|
| QC Batch | A set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots. |
| Duplicate Control Sample (DCS) | Consist of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects. This QC is performed only if required by client or when insufficient sample is available to perform MS/MSD. |
| Duplicate Sample (DU) | A second aliquot of an environmental sample, taken from the same sample container when possible, that is processed independently with the first sample aliquot. The results are used to assess the effect of the sample matrix on the precision of the analytical process. The precision estimated using this sample is not necessarily representative of the precision for other samples in the batch. |
| Laboratory Control Sample (LCS) | A volume of reagent water for aqueous samples or a contaminant-free solid matrix (Ottawa sand) for soil and sediment samples which is spiked with known amounts of representative target analytes and required surrogates. An LCS is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. |
| Matrix Spike and Matrix Spike Duplicate (MS/MSD) | A field sample fortified with known quantities of target analytes that are also added to the LCS. Matrix spike duplicate is a second matrix spike sample. MSs/MSDs are carried through the entire analytical process and are used to determine sample matrix effect on accuracy of the measurement system. The accuracy and precision estimated using MS/MSD is only representative of the precision of the sample that was spiked. |
| Method Blank (MB) | A sample composed of all the reagents (in the same quantities) in reagent water carried through the entire analytical process. The method blank is used to monitor the level of contamination introduced during sample preparation steps. |
| Surrogate Spike | Organic constituents not expected to be detected in environmental media and are added to every sample and QC at a known concentration. Surrogates are used to determine the efficiency of the sample preparation and the analytical process. |

Source: Quanterra® Quality Control Program, Policy QA-003, Rev. 0, 8/19/96.

Quanterra

# SAMPLE SUMMARY

GOD260236

| WO # | SAMPLE# | CLIENT SAMPLE ID | DATE | TIM |
|---|---|---|---|---|
| DCF6G | 001 | HS-MW-3-6.5' | 04/04/00 | 16:1 |
| DCF6J | 002 | HS-MW-4-7' | 04/04/00 | 12: |
| DCF6K | 003 | TL-MW-2-9' | 04/04/00 | 09: |
| DCF6M | 004 | TL-MW-5-9' | 04/03/00 | 14: |
| DCF6N | 005 | HS-SSP-S01 | 04/18/00 | 12: |
| DCF6P | 006 | TL-MW-3-PO1 | 04/18/00 | 12 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# CHAIN OF CUSTODY RECORD

GEOENGINEERS, INC.
1101 FAWCETT, SUITE 200
TACOMA, WASHINGTON 98402
(~~206~~) 383-4940
253

Geo Engineers

DATE 4/21/00
PAGE 1 OF 1
LAB STL
LAB NO.

PROJECT NAME/LOCATION Former Haley Site / Bellingham
PROJECT NUMBER 0215-002-00
PROJECT MANAGER Sandy Smith
SAMPLED BY JJO / DJB

| SAMPLE IDENTIFICATION | | SAMPLE COLLECTION | | | # OF JARS | 8290 - Dioxins/Furans | NOTES/COMMENTS (Preserved, filtered, etc.) |
|---|---|---|---|---|---|---|---|
| LAB | GEOENGINEERS | DATE | TIME | MATRIX | | | |
| | HS-MW-3-6.5' | 4/4/00 | 16:10 | Soil | 1 | X | |
| | HS-MW-4-7' | 4/4/00 | 12:45 | Soil | 1 | X | |
| | TL-MW-2-9' | 4/4/00 | 09:10 | Soil | 1 | X | |
| | TL-MW-5-9' | 4/3/00 | 14:55 | Soil | 1 | X | |
| | HS-SSP-S01 | 4/18/00 | 12:40 | Soil | 1 | X | |
| | TL-MW-3-P01 | 4/18/00 | 12:00 | Oil | 1 | X | Please analyze oil fraction only. |

RECEIVED IN GOOD CONDITION UNDER COC
APR 22 2000
INI:

RELINQUISHED BY
SIGNATURE Sandra B Smith
PRINTED NAME Sandra B Smith
DATE 4/21/00 TIME 12:00
FIRM GeoEngineers

RELINQUISHED BY
SIGNATURE Colette Weaver
PRINTED NAME Colette Weaver
DATE 4/21/00 TIME 11:05
FIRM NCA Portland

RELINQUISHED BY
SIGNATURE
PRINTED NAME
DATE TIME
FIRM

RECEIVED BY
SIGNATURE
PRINTED NAME C. Hytrek
DATE 4-22-00 TIME 1300
FIRM STL

RECEIVED BY
SIGNATURE
PRINTED NAME
DATE TIME
FIRM

RECEIVED BY
SIGNATURE
PRINTED NAME
DATE TIME
FIRM

ADDITIONAL COMMENTS: Quick TAT - 14-Day Requested

STL Project Manager: Jill Kellman

Quanterra

GEOENGINEERS INC

Client Sample ID: HS-MW-3-6.5'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-001 Work Order #...: DCF6G102 Matrix.....: SOLID
Date Sampled...: 04/04/00 Date Received..: 04/22/00
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | 1.8 | | pg/g | SW846 8290 |
| Total TCDD | 190 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 7.4 | | pg/g | SW846 8290 |
| Total PeCDD | 260 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 20 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 590 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 55 | | pg/g | SW846 8290 |
| Total HxCDD | 2100 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 12000 E | | pg/g | SW846 8290 |
| Total HpCDD | 21000 | | pg/g | SW846 8290 |
| OCDD | 110000 D,E | | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 23 CON | | pg/g | SW846 8290 |
| Total TCDF | 140 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 43 | | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 52 | | pg/g | SW846 8290 |
| Total PeCDF | 720 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 180 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 40 | | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 41 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 6.0 | | pg/g | SW846 8290 |
| Total HxCDF | 3400 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 1400 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 96 | | pg/g | SW846 8290 |
| Total HpCDF | 7100 | | pg/g | SW846 8290 |
| OCDF | 6600 E | | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 68 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 80 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 68 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | (40 - 135) |
| 13C-OCDD | 54 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 62 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 76 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 72 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 57 | (40 - 135) |

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

E Estimated result. Result concentration exceeds the calibration range.

D Result was obtained from the analysis of a dilution.

CON Confirmation analysis.

GEOENGINEERS INC

Client Sample ID: HS-MW-4-7'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-002 Work Order #...: DCF6J102 Matrix.....: SOLID
Date Sampled...: 04/04/00 Date Received..: 04/22/00
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.36 | pg/g | SW846 8290 |
| Total TCDD | 4.6 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 4.5 J | | pg/g | SW846 8290 |
| Total PeCDD | 11 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 15 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 1600 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 74 | | pg/g | SW846 8290 |
| Total HxCDD | 3800 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 23000 D | | pg/g | SW846 8290 |
| Total HpCDD | 39000 D | | pg/g | SW846 8290 |
| OCDD | 190000 D | | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 29 CON | | pg/g | SW846 8290 |
| Total TCDF | 65 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 84 | | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 83 | | pg/g | SW846 8290 |
| Total PeCDF | 1300 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 260 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 66 | | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 94 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 14 | | pg/g | SW846 8290 |
| Total HxCDF | 6000 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 2500 E | | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 130 | | pg/g | SW846 8290 |
| Total HpCDF | 9500 | | pg/g | SW846 8290 |
| OCDF | 4500 D | | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 86 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 72 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 56 | (40 - 135) |
| 13C-OCDD | 48 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 66 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 80 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 84 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 54 | (40 - 135) |

(Continued on next page)

GEOENGINEERS INC

Client Sample ID: HS-MW-4-7'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-002 Work Order #...: DCF6J102 Matrix.....: SOLID

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

D Result was obtained from the analysis of a dilution.

CON Confirmation analysis.

E Estimated result. Result concentration exceeds the calibration range.

GEOENGINEERS INC

Client Sample ID: TL-MW-2-9'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-003 Work Order #...: DCF6K102 Matrix.....: SOLID
Date Sampled...: 04/04/00 Date Received..: 04/22/00
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | 3.3 | | pg/g | SW846 8290 |
| Total TCDD | 210 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 26 | | pg/g | SW846 8290 |
| Total PeCDD | 460 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 150 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 9900 E | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 700 | | pg/g | SW846 8290 |
| Total HxCDD | 26000 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 270000 D,E | | pg/g | SW846 8290 |
| Total HpCDD | 440000 D | | pg/g | SW846 8290 |
| OCDD | 1100000 D,E | | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 120 CON | | pg/g | SW846 8290 |
| Total TCDF | 270 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 500 | | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 720 | | pg/g | SW846 8290 |
| Total PeCDF | 8700 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 4500 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 720 | | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 420 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 110 | | pg/g | SW846 8290 |
| Total HxCDF | 90000 D | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 76000 D | | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 4200 D | | pg/g | SW846 8290 |
| Total HpCDF | 510000 D | | pg/g | SW846 8290 |
| OCDF | 400000 D | | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 90 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 69 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 110 | (40 - 135) |
| 13C-OCDD | 168 * | (40 - 135) |
| 13C-2,3,7,8-TCDF | 60 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 71 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 92 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 88 | (40 - 135) |

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GEOENGINEERS INC

Client Sample ID: TL-MW-2-9'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-003 Work Order #...: DCF6K102 Matrix.....: SOLID

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

E Estimated result. Result concentration exceeds the calibration range.

D Result was obtained from the analysis of a dilution.

CON Confirmation analysis.

* Surrogate recovery is outside stated control limits.

GEOENGINEERS INC

Client Sample ID: TL-MW-5-9'

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-004 Work Order #...: DCF6M102 Matrix.....: SOLID
Date Sampled...: 04/03/00 Date Received..: 04/22/00
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.93 J | | pg/g | SW846 8290 |
| Total TCDD | 160 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 4.7 J | | pg/g | SW846 8290 |
| Total PeCDD | 160 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 11 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 380 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 41 | | pg/g | SW846 8290 |
| Total HxCDD | 1200 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 11000 E | | pg/g | SW846 8290 |
| Total HpCDD | 17000 | | pg/g | SW846 8290 |
| OCDD | 110000 D | | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 14 CON | | pg/g | SW846 8290 |
| Total TCDF | 110 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 28 | | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 35 | | pg/g | SW846 8290 |
| Total PeCDF | 520 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 180 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 32 | | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 22 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 4.8 J | | pg/g | SW846 8290 |
| Total HxCDF | 3300 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 2300 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 150 | | pg/g | SW846 8290 |
| Total HpCDF | 13000 | | pg/g | SW846 8290 |
| OCDF | 14000 E | | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 74 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 88 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 71 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 77 | (40 - 135) |
| 13C-OCDD | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 64 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 85 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 83 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 60 | (40 - 135) |

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GEOENGINEERS INC

Client Sample ID: TL-MW-5-9'

Trace Level Organic Compounds

Lot-Sample #...: GCD260236-004 Work Order #...: DCF6M102 Matrix.....: SOLID

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than the reporting limit.

E Estimated result. Result concentration exceeds the calibration range.

D Result was obtained from the analysis of a dilution.

CON Confirmation analysis.

GEOENGINEERS INC

Client Sample ID: HS-SSP-S01

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-005 Work Order #...: DCF6N102 Matrix.....: SOLID
Date Sampled...: 04/18/00 Date Received..: 04/22/00
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | 1.4 | | pg/g | SW846 8290 |
| Total TCDD | 72 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 19 | | pg/g | SW846 8290 |
| Total PeCDD | 160 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 53 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 1900 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 210 | | pg/g | SW846 8290 |
| Total HxCDD | 5200 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 52000 D | | pg/g | SW846 8290 |
| Total HpCDD | 87000 D | | pg/g | SW846 8290 |
| OCDD | 390000 D,E | | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 51 CON | | pg/g | SW846 8290 |
| Total TCDF | 150 | | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 140 | | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 160 | | pg/g | SW846 8290 |
| Total PeCDF | 2500 | | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 790 | | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 150 | | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 140 | | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 19 | | pg/g | SW846 8290 |
| Total HxCDF | 15000 | | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 8700 D | | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 490 D | | pg/g | SW846 8290 |
| Total HpCDF | 42000 D | | pg/g | SW846 8290 |
| OCDF | 42000 D | | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 72 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 77 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 75 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 80 | (40 - 135) |
| 13C-OCDD | 112 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 70 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 73 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 77 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | (40 - 135) |

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

D Result was obtained from the analysis of a dilution.

E Estimated result. Result concentration exceeds the calibration range.

CON Confirmation analysis.

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GEOENGINEERS INC

Client Sample ID: TL-MW-3-PO1

Trace Level Organic Compounds

Lot-Sample #...: G0D260236-006 Work Order #...: DCF6P101 Matrix.....: WASTE
Date Sampled...: 04/18/00 Date Received..: 04/22/00
Prep Date.....: 05/01/00 Analysis Date..: 05/04/00
Prep Batch #...: 0122425
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | 140 | ** | pg/g | SW846 8290 |
| Total TCDD | 7000 | ** | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | 700 | ** | pg/g | SW846 8290 |
| Total PeCDD | 9600 | ** | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 2900 | ** | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 310000 E | ** | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 18000 | ** | pg/g | SW846 8290 |
| Total HxCDD | 710000 | ** | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 8100000 D | ** | pg/g | SW846 8290 |
| Total HpCDD | 13000000 D | ** | pg/g | SW846 8290 |
| OCDD | 40000000 D,E | ** | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | 7500 CON | ** | pg/g | SW846 8290 |
| Total TCDF | 19000 | ** | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | 26000 | ** | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | 28000 | ** | pg/g | SW846 8290 |
| Total PeCDF | 370000 | ** | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 140000 | ** | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 25000 | ** | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 22000 | ** | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 4500 | ** | pg/g | SW846 8290 |
| Total HxCDF | 2800000 | ** | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 1400000 D | ** | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 82000 D | ** | pg/g | SW846 8290 |
| Total HpCDF | 6900000 D | ** | pg/g | SW846 8290 |
| OCDF | 7500000 D | ** | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 90 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 99 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 88 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 130 | (40 - 135) |
| 13C-OCDD | 118 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 94 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 91 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 92 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 131 | (40 - 135) |

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

E Estimated result. Result concentration exceeds the calibration range.

D Result was obtained from the analysis of a dilution.

CON Confirmation analysis.

Quanterra

# QC DATA ASSOCIATION SUMMARY

G0D260236

Sample Preparation and Analysis Control Numbers

| SAMPLE# | MATRIX | ANALYTICAL METHOD | LEACH BATCH # | PREP BATCH # | MS RUN# |
|---|---|---|---|---|---|
| 001 | SOLID | SW846 8290 | | 0119326 | |
| | SOLID | ASTM D 2216-90 | | 0128107 | |
| 002 | SOLID | SW846 8290 | | 0119326 | |
| | SOLID | ASTM D 2216-90 | | 0128107 | |
| 003 | SOLID | SW846 8290 | | 0119326 | |
| | SOLID | ASTM D 2216-90 | | 0128107 | |
| 004 | SOLID | SW846 8290 | | 0119326 | |
| | SOLID | ASTM D 2216-90 | | 0126274 | |
| 005 | SOLID | SW846 8290 | | 0119326 | |
| | SOLID | ASTM D 2216-90 | | 0126274 | |
| 006 | WASTE | SW846 8290 | | 0122425 | |

Quanterra

# METHOD BLANK REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCU7M101 Matrix.....: SOLID
MB Lot-Sample #: G0D280000-326

Prep Date.....: 04/28/00
Analysis Date..: 05/04/00 Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 0.44 | pg/g | SW846 8290 |
| **Total TCDD** | **1.7** | | **pg/g** | **SW846 8290** |
| 1,2,3,7,8-PeCDD | ND | 0.74 | pg/g | SW846 8290 |
| Total PeCDD | ND | 0.74 | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | ND | 0.58 | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | ND | 0.72 | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | ND | 0.48 | pg/g | SW846 8290 |
| Total HxCDD | ND | 0.72 | pg/g | SW846 8290 |
| **1,2,3,4,6,7,8-HpCDD** | **14** | | **pg/g** | **SW846 8290** |
| **Total HpCDD** | **22** | | **pg/g** | **SW846 8290** |
| **OCDD** | **140** | | **pg/g** | **SW846 8290** |
| 2,3,7,8-TCDF | ND | 0.32 | pg/g | SW846 8290 |
| Total TCDF | ND | 0.43 | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | ND | 0.51 | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | ND | 0.50 | pg/g | SW846 8290 |
| Total PeCDF | ND | 0.51 | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | ND | 0.42 | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | ND | 0.42 | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | ND | 0.42 | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | ND | 0.48 | pg/g | SW846 8290 |
| **Total HxCDF** | **3.1** | | **pg/g** | **SW846 8290** |
| **1,2,3,4,6,7,8-HpCDF** | **4.8 J** | | **pg/g** | **SW846 8290** |
| 1,2,3,4,7,8,9-HpCDF | ND | 0.52 | pg/g | SW846 8290 |
| **Total HpCDF** | **24** | | **pg/g** | **SW846 8290** |
| **OCDF** | **26** | | **pg/g** | **SW846 8290** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 81 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 69 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | (40 - 135) |
| 13C-OCDD | 68 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 72 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 77 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 73 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 63 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

J Estimated result. Result is less than the reporting limit.

Quanterra

# METHOD BLANK REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCLJE101 Matrix.....: WASTE
MB Lot-Sample #: G0B010000-425

Prep Date.....: 05/01/00
Analysis Date..: 05/04/00 Prep Batch #...: 0122425
Dilution Factor: 1

| PARAMETER | RESULT | DETECTION LIMIT | UNITS | METHOD |
|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 130 | pg/g | SW846 8290 |
| Total TCDD | ND | 130 | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDD | ND | 180 | pg/g | SW846 8290 |
| Total PeCDD | ND | 180 | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | ND | 180 | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | ND | 170 | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | ND | 160 | pg/g | SW846 8290 |
| Total HxCDD | ND | 180 | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | ND | 150 | pg/g | SW846 8290 |
| Total HpCDD | ND | 150 | pg/g | SW846 8290 |
| OCDD | ND | 150 | pg/g | SW846 8290 |
| 2,3,7,8-TCDF | ND | 98 | pg/g | SW846 8290 |
| Total TCDF | ND | 98 | pg/g | SW846 8290 |
| 1,2,3,7,8-PeCDF | ND | 110 | pg/g | SW846 8290 |
| 2,3,4,7,8-PeCDF | ND | 110 | pg/g | SW846 8290 |
| Total PeCDF | ND | 130 | pg/g | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | ND | 200 | pg/g | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | ND | 180 | pg/g | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | ND | 200 | pg/g | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | ND | 210 | pg/g | SW846 8290 |
| Total HxCDF | ND | 210 | pg/g | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | ND | 81 | pg/g | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | ND | 95 | pg/g | SW846 8290 |
| Total HpCDF | ND | 95 | pg/g | SW846 8290 |
| OCDF | ND | 230 | pg/g | SW846 8290 |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 86 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 89 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 94 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 94 | (40 - 135) |
| 13C-OCDD | 83 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 74 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 87 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 93 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 107 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quanterra

# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCJ7M102 Matrix.....: SOLID
LCS Lot-Sample#: G0D280000-326
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | METHOD |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 20.0 | 20.6 | pg/g | 103 | SW846 8290 |
| 1,2,3,7,8-PeCDD | 100 | 92.4 | pg/g | 92 | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 100 | 110 | pg/g | 110 | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 100 | 97.1 | pg/g | 97 | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 100 | 104 | pg/g | 104 | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 100 | 90.0 | pg/g | 90 | SW846 8290 |
| OCDD | 200 | 174 | pg/g | 87 | SW846 8290 |
| 2,3,7,8-TCDF | 20.0 | 17.8 | pg/g | 89 | SW846 8290 |
| 1,2,3,7,8-PeCDF | 100 | 93.8 | pg/g | 94 | SW846 8290 |
| 2,3,4,7,8-PeCDF | 100 | 92.9 | pg/g | 93 | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 100 | 92.9 | pg/g | 93 | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 100 | 84.7 | pg/g | 85 | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 100 | 96.0 | pg/g | 96 | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 100 | 84.6 | pg/g | 85 | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 100 | 89.1 | pg/g | 89 | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 100 | 84.5 | pg/g | 85 | SW846 8290 |
| OCDF | 200 | 166 | pg/g | 83 | SW846 8290 |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 72 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 62 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 65 | (40 - 135) |
| 13C-OCDD | 62 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 68 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 70 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 64 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 64 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Quanterra

# LABORATORY CONTROL SAMPLE EVALUATION REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCJ7M102 Matrix.....: SOLID
LCS Lot-Sample#: G0D280000-326
Prep Date.....: 04/28/00 Analysis Date..: 05/04/00
Prep Batch #...: 0119326
Dilution Factor: 1

| PARAMETER | PERCENT RECOVERY | RECOVERY LIMITS | METHOD |
|---|---|---|---|
| 2,3,7,8-TCDD | 103 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8-PeCDD | 92 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 110 | (50 - 150) | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 97 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 104 | (50 - 150) | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 90 | (50 - 150) | SW846 8290 |
| OCDD | 87 | (50 - 150) | SW846 8290 |
| 2,3,7,8-TCDF | 89 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8-PeCDF | 94 | (50 - 150) | SW846 8290 |
| 2,3,4,7,8-PeCDF | 93 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 93 | (50 - 150) | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 85 | (50 - 150) | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 96 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 85 | (50 - 150) | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 89 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 85 | (50 - 150) | SW846 8290 |
| OCDF | 83 | (50 - 150) | SW846 8290 |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 72 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 62 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 65 | (40 - 135) |
| 13C-OCDD | 62 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 68 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 70 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 64 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 64 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Quanterra

# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCLJE102 Matrix.....: WASTE
LCS Lot-Sample#: G0E010000-425
Prep Date.....: 05/01/00 Analysis Date..: 05/04/00
Prep Batch #...: 0122425
Dilution Factor: 1

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | METHOD |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **2000** | **1920** | pg/g | **96** | **SW846 829(** |
| **1,2,3,7,8-PeCDD** | **10000** | **8890** | pg/g | **89** | **SW846 829(** |
| **1,2,3,4,7,8-HxCDD** | **10000** | **8650** | pg/g | **86** | **SW846 829(** |
| **1,2,3,6,7,8-HxCDD** | **10000** | **9260** | pg/g | **93** | **SW846 829(** |
| **1,2,3,7,8,9-HxCDD** | **10000** | **8740** | pg/g | **87** | **SW846 829(** |
| **1,2,3,4,6,7,8-HpCDD** | **10000** | **10100** | pg/g | **101** | **SW846 8290** |
| **OCDD** | **20000** | **19200** | pg/g | **96** | **SW846 829(** |
| **2,3,7,8-TCDF** | **2000** | **1740** | pg/g | **87** | **SW846 829(** |
| **1,2,3,7,8-PeCDF** | **10000** | **10200** | pg/g | **102** | **SW846 8290** |
| **2,3,4,7,8-PeCDF** | **10000** | **8660** | pg/g | **87** | **SW846 829(** |
| **1,2,3,4,7,8-HxCDF** | **10000** | **10700** | pg/g | **107** | **SW846 829(** |
| **1,2,3,6,7,8-HxCDF** | **10000** | **10900** | pg/g | **109** | **SW846 829(** |
| **2,3,4,6,7,8-HxCDF** | **10000** | **9420** | pg/g | **94** | **SW846 8290** |
| **1,2,3,7,8,9-HxCDF** | **10000** | **9430** | pg/g | **94** | **SW846 829(** |
| **1,2,3,4,6,7,8-HpCDF** | **10000** | **10100** | pg/g | **101** | **SW846 829(** |
| **1,2,3,4,7,8,9-HpCDF** | **10000** | **9740** | pg/g | **97** | **SW846 8290** |
| **OCDF** | **20000** | **20900** | pg/g | **105** | **SW846 829(** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 91 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 90 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 94 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 105 | (40 - 135) |
| 13C-OCDD | 95 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 88 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 89 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 99 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 116 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

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# LABORATORY CONTROL SAMPLE EVALUATION REPORT

## Trace Level Organic Compounds

Client Lot #...: G0D260236 Work Order #...: DCLJE102 Matrix.....: WASTE
LCS Lot-Sample#: G0E010000-425
Prep Date.....: 05/01/00 Analysis Date..: 05/04/00
Prep Batch #...: 0122425
Dilution Factor: 1

| PARAMETER | PERCENT RECOVERY | RECOVERY LIMITS | METHOD |
|---|---|---|---|
| 2,3,7,8-TCDD | 96 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8-PeCDD | 89 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8-HxCDD | 86 | (50 - 150) | SW846 8290 |
| 1,2,3,6,7,8-HxCDD | 93 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8,9-HxCDD | 87 | (50 - 150) | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDD | 101 | (50 - 150) | SW846 8290 |
| OCDD | 96 | (50 - 150) | SW846 8290 |
| 2,3,7,8-TCDF | 87 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8-PeCDF | 102 | (50 - 150) | SW846 8290 |
| 2,3,4,7,8-PeCDF | 87 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8-HxCDF | 107 | (50 - 150) | SW846 8290 |
| 1,2,3,6,7,8-HxCDF | 109 | (50 - 150) | SW846 8290 |
| 2,3,4,6,7,8-HxCDF | 94 | (50 - 150) | SW846 8290 |
| 1,2,3,7,8,9-HxCDF | 94 | (50 - 150) | SW846 8290 |
| 1,2,3,4,6,7,8-HpCDF | 101 | (50 - 150) | SW846 8290 |
| 1,2,3,4,7,8,9-HpCDF | 97 | (50 - 150) | SW846 8290 |
| OCDF | 105 | (50 - 150) | SW846 8290 |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 91 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 90 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 94 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 105 | (40 - 135) |
| 13C-OCDD | 95 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 88 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 89 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 99 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 116 | (40 - 135) |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

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Geo Engineers - Seattle
600 Stewart St, Suite 1420
Seattle, WA/USA 98101

Project: R.G. Haley International Corporation Site
Project Number: 0275-002-01
Project Manager: Jay Lucas

**Amended Report**
Issued: 08/26/04 13:05

## EPA 8290

## Frontier Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **UST-061504 (B4F0621-55) Other wet** | **Sampled: 06/15/04 12:53** | | **Received: 06/16/04 17:10** | | | | | | |
| **1,2,3,4,6,7,8-HpCDD** | **2890000** | 25.0 | pg/g | 1 | X298 | 07/14/04 | 07/15/04 | EPA 8290 | |
| **1,2,3,4,6,7,8-HpCDF** | **167000** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,4,7,8,9-HpCDF** | **6630** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,4,7,8-HxCDD** | **4530** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,4,7,8-HxCDF** | **12900** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,6,7,8-HxCDD** | **183000** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,6,7,8-HxCDF** | **6850** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,7,8,9-HxCDD** | **20500** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,7,8,9-HxCDF** | **14700** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,7,8-PeCDD** | **764** | 25.0 | " | " | " | " | " | " | |
| **1,2,3,7,8-PeCDF** | **7150** | 25.0 | " | " | " | " | " | " | |
| **2,3,4,6,7,8-HxCDF** | **17200** | 25.0 | " | " | " | " | " | " | |
| **2,3,4,7,8-PeCDF** | **5170** | 25.0 | " | " | " | " | " | " | |
| 2,3,7,8-TCDD | ND | 5.00 | " | " | " | " | " | " | |
| **2,3,7,8-TCDF** | **1810** | 5.00 | " | " | " | " | " | " | F |
| **OCDD** | **10800000** | 50 | " | " | " | " | " | " | B |
| **OCDF** | **93000** | 50 | " | " | " | " | " | " | |
| **Total Hepta-Dioxins** | **4980000** | | " | " | " | " | " | " | |
| **Total Hepta-Furans** | **593000** | | " | " | " | " | " | " | |
| **Total Hexa-Dioxins** | **489000** | | " | " | " | " | " | " | |
| **Total Hexa-Furans** | **458000** | | " | " | " | " | " | " | |
| **Total Penta-Dioxins** | **3390** | | " | " | " | " | " | " | |
| **Total Penta-Furans** | **52500** | | " | " | " | " | " | " | |
| **Total Tetra-Dioxins** | **95.1** | | " | " | " | " | " | " | |
| **Total Tetra-Furans** | **6020** | | " | " | " | " | " | " | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDD* | *86.5 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDF* | *59.3 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,4,7,8,9-HpCDF* | *74.0 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDD* | *81.3 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDF* | *61.0 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDD* | *80.0 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDF* | *60.6 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,7,8,9-HxCDF* | *67.7 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,7,8-PeCDD* | *76.6 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-1,2,3,7,8-PeCDF* | *83.9 %* | *40-135* | | | " | " | " | " | |

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

J. Wo

Scott A. Woerman, Account Manager

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| | | |
|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1420 | Project Number: 0275-002-01 | **Amended Report** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | Issued: 08/26/04 13:05 |

## EPA 8290

## Frontier Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **UST-061504 (B4F0621-55) Other wet Sampled: 06/15/04 12:53 Received: 06/16/04 17:10** | | | | | | | | | |
| *Surrogate: 13C-2,3,4,6,7,8-HxCDF* | *60.1 %* | *40-135* | | | *X298* | *07/14/04* | *07/15/04* | " | |
| *Surrogate: 13C-2,3,4,7,8-PeCDF* | *82.4 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-2,3,7,8-TCDD* | *61.8 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 13C-2,3,7,8-TCDF* | *56.3 %* | *40-135* | | | " | " | " | " | |
| *Surrogate: 37Cl-2,3,7,8-TCDD* | *63.4 %* | *50-150* | | | " | " | " | " | |
| *Surrogate: 13C-OCDD* | *156 %* | *40-135* | | | " | " | " | " | *A* |
| *Surrogate: 13C-OCDF* | *81.3 %* | *40-135* | | | " | " | " | " | |





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Geo Engineers - Seattle
600 Stewart St, Suite 1420
Seattle, WA/USA 98101

Project: R.G. Haley International Corporation Site
Project Number: 0275-002-01
Project Manager: Jay Lucas

**Amended Report**
Issued: 08/26/04 13:05

# EPA 8290 - Quality Control
## Frontier Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch X298: Prepared 07/14/04 Using General Prep** | | | | | | | | | | |
| **Blank (0298-001-MB)** | | | | | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | ND | 25.0 | pg/g | | ND | | | NA | 50 | |
| 1,2,3,4,6,7,8-HpCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,4,7,8,9-HpCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,4,7,8-HxCDD | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,4,7,8-HxCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,6,7,8-HxCDD | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,6,7,8-HxCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,7,8,9-HxCDD | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,7,8,9-HxCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,7,8-PeCDD | ND | 25.0 | " | | ND | | | NA | 50 | |
| 1,2,3,7,8-PeCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 2,3,4,6,7,8-HxCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 2,3,4,7,8-PeCDF | ND | 25.0 | " | | ND | | | NA | 50 | |
| 2,3,7,8-TCDD | ND | 5.00 | " | | ND | | | NA | 50 | |
| 2,3,7,8-TCDF | ND | 5.00 | " | | ND | | | NA | 50 | |
| OCDD | 48.4 | 50.0 | " | | ND | | | | 50 | J |
| OCDF | ND | 50.0 | " | | ND | | | NA | 50 | |
| Total Hepta-Dioxins | ND | | " | | ND | | | NA | 50 | |
| Total Hepta-Furans | ND | | " | | ND | | | NA | 50 | |
| Total Hexa-Dioxins | ND | | " | | ND | | | NA | 50 | |
| Total Hexa-Furans | ND | | " | | ND | | | NA | 50 | |
| Total Penta-Dioxins | ND | | " | | ND | | | NA | 50 | |
| Total Penta-Furans | ND | | " | | ND | | | NA | 50 | |
| Total Tetra-Dioxins | ND | | " | | ND | | | NA | 50 | |
| Total Tetra-Furans | ND | | " | | ND | | | NA | 50 | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDD* | *1620* | | " | *2000* | *ND* | *81.0* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDF* | *1350* | | " | *2000* | *ND* | *67.3* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8,9-HpCDF* | *1570* | | " | *2000* | *ND* | *78.4* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDD* | *1790* | | " | *2000* | *ND* | *89.4* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDF* | *1570* | | " | *2000* | *ND* | *78.3* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDD* | *1840* | | " | *2000* | *ND* | *91.9* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDF* | *1590* | | " | *2000* | *ND* | *79.5* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,7,8,9-HxCDF* | *1530* | | " | *2000* | *ND* | *76.6* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,7,8-PeCDD* | *1690* | | " | *2000* | *ND* | *84.3* | *40-135* | | | |

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

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| | | |
|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1420 | Project Number: 0275-002-01 | **Amended Report** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | Issued: 08/26/04 13:05 |

# EPA 8290 - Quality Control
## Frontier Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch X298: Prepared 07/14/04 Using General Prep** | | | | | | | | | | |
| **Blank (0298-001-MB)** | | | | | | | | | | |
| *Surrogate: 13C-1,2,3,7,8-PeCDF* | *1890* | | *pg/g* | *2000* | *ND* | *94.5* | *40-135* | | | |
| *Surrogate: 13C-2,3,4,6,7,8-HxCDF* | *1460* | | *"* | *2000* | *ND* | *73.1* | *40-135* | | | |
| *Surrogate: 13C-2,3,4,7,8-PeCDF* | *1940* | | *"* | *2000* | *ND* | *97.1* | *40-135* | | | |
| *Surrogate: 13C-2,3,7,8-TCDD* | *1880* | | *"* | *2000* | *ND* | *94.2* | *40-135* | | | |
| *Surrogate: 13C-2,3,7,8-TCDF* | *2050* | | *"* | *2000* | *ND* | *102* | *40-135* | | | |
| *Surrogate: 37Cl-2,3,7,8-TCDD* | *675* | | *"* | *800.0* | *ND* | *84.4* | *50-150* | | | |
| *Surrogate: 13C-OCDD* | *2420* | | *"* | *4000* | *ND* | *60.6* | *40-135* | | | |
| *Surrogate: 13C-OCDF* | *2400* | | *"* | *4000* | *ND* | *60.1* | *40-135* | | | |
| **LCS (0298-001-OPR)** | | | | | | | | | | |
| 1,2,3,4,6,7,8-HpCDD | 47.8 | 25.0 | pg/g | 50.0 | ND | 95.6 | 70-140 | | 50 | |
| 1,2,3,4,6,7,8-HpCDF | 51.1 | 25.0 | " | 50.0 | ND | 102 | 70-140 | | 50 | |
| 1,2,3,4,7,8,9-HpCDF | 51.2 | 25.0 | " | 50.0 | ND | 102 | 70-140 | | 50 | |
| 1,2,3,4,7,8-HxCDD | 48.9 | 25.0 | " | 50.0 | ND | 97.8 | 70-140 | | 50 | |
| 1,2,3,4,7,8-HxCDF | 50.1 | 25.0 | " | 50.0 | ND | 100.0 | 70-140 | | 50 | |
| 1,2,3,6,7,8-HxCDD | 48.7 | 25.0 | " | 50.0 | ND | 97.4 | 70-140 | | 50 | |
| 1,2,3,6,7,8-HxCDF | 48.7 | 25.0 | " | 50.0 | ND | 97.4 | 70-140 | | 50 | |
| 1,2,3,7,8,9-HxCDD | 44.0 | 25.0 | " | 50.0 | ND | 88.0 | 70-140 | | 50 | |
| 1,2,3,7,8,9-HxCDF | 49.1 | 25.0 | " | 50.0 | ND | 98.2 | 70-140 | | 50 | |
| 1,2,3,7,8-PeCDD | 46.6 | 25.0 | " | 50.0 | ND | 93.2 | 70-140 | | 50 | |
| 1,2,3,7,8-PeCDF | 47.4 | 25.0 | " | 50.0 | ND | 94.8 | 70-140 | | 50 | |
| 2,3,4,6,7,8-HxCDF | 49.1 | 25.0 | " | 50.0 | ND | 98.2 | 70-140 | | 50 | |
| 2,3,4,7,8-PeCDF | 47.0 | 25.0 | " | 50.0 | ND | 94.0 | 70-140 | | 50 | |
| 2,3,7,8-TCDD | 7.83 | 5.00 | " | 10.0 | ND | 78.3 | 70-140 | | 50 | |
| 2,3,7,8-TCDF | 9.12 | 5.00 | " | 10.0 | ND | 91.2 | 70-140 | | 50 | |
| OCDD | 98.5 | 50.0 | " | 100.0 | ND | 98.5 | 70-140 | | 50 | |
| OCDF | 96.9 | 50.0 | " | 100.0 | ND | 96.9 | 70-140 | | 50 | |
| Total Hepta-Dioxins | 53.3 | | " | | ND | | | | 50 | |
| Total Hepta-Furans | 106 | | " | | ND | | | | 50 | |
| Total Hexa-Dioxins | 144 | | " | | ND | | | | 50 | |
| Total Hexa-Furans | 199 | | " | | ND | | | | 50 | |
| Total Penta-Dioxins | 47.4 | | " | | ND | | | | 50 | |
| Total Penta-Furans | 99.3 | | " | | ND | | | | 50 | |
| Total Tetra-Dioxins | 9.31 | | " | | ND | | | | 50 | |
| Total Tetra-Furans | 10.9 | | " | | ND | | | | 50 | |

North Creek Analytical - Bothell

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

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|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1420 | Project Number: 0275-002-01 | **Amended Report** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | Issued: 08/26/04 13:05 |

# EPA 8290 - Quality Control
## Frontier Analytical Laboratory

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch X298: Prepared 07/14/04 Using General Prep** | | | | | | | | | | |
| **LCS (0298-001-OPR)** | | | | | | | | | | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDD* | *73.7* | | *pg/g* | *100.0* | *ND* | *73.7* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,6,7,8-HpCDF* | *62.4* | | *"* | *100.0* | *ND* | *62.4* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8,9-HpCDF* | *72.8* | | *"* | *100.0* | *ND* | *72.8* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDD* | *88.3* | | *"* | *100.0* | *ND* | *88.3* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,4,7,8-HxCDF* | *78.0* | | *"* | *100.0* | *ND* | *78.0* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDD* | *93.8* | | *"* | *100.0* | *ND* | *93.8* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,6,7,8-HxCDF* | *78.0* | | *"* | *100.0* | *ND* | *78.0* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,7,8,9-HxCDF* | *69.9* | | *"* | *100.0* | *ND* | *69.9* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,7,8-PeCDD* | *78.6* | | *"* | *100.0* | *ND* | *78.6* | *40-135* | | | |
| *Surrogate: 13C-1,2,3,7,8-PeCDF* | *90.9* | | *"* | *100.0* | *ND* | *90.9* | *40-135* | | | |
| *Surrogate: 13C-2,3,4,6,7,8-HxCDF* | *64.8* | | *"* | *100.0* | *ND* | *64.8* | *40-135* | | | |
| *Surrogate: 13C-2,3,4,7,8-PeCDF* | *86.3* | | *"* | *100.0* | *ND* | *86.3* | *40-135* | | | |
| *Surrogate: 13C-2,3,7,8-TCDD* | *86.9* | | *"* | *100.0* | *ND* | *86.9* | *40-135* | | | |
| *Surrogate: 13C-2,3,7,8-TCDF* | *97.6* | | *"* | *100.0* | *ND* | *97.6* | *40-135* | | | |
| *Surrogate: 37Cl-2,3,7,8-TCDD* | *32.6* | | *"* | *40.0* | *ND* | *81.5* | *50-150* | | | |
| *Surrogate: 13C-OCDD* | *103* | | *"* | *200.0* | *ND* | *51.3* | *40-135* | | | |
| *Surrogate: 13C-OCDF* | *104* | | *"* | *200.0* | *ND* | *51.9* | *40-135* | | | |

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|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1420 | Project Number: 0275-002-01 | **Amended Report** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | Issued: 08/26/04 13:05 |

## Notes and Definitions

| | |
|---|---|
| A | Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1 |
| A-01 | The percent recovery for this analyte falls outside the project's control limits but are within the recovery limits established by the laboratory. |
| A-02 | An AK103 standard was used instead of a Lube Oil Range standard for the closing CCV. |
| B | Analyte is present in Method Blank |
| D-09 | Results in the diesel organics range are primarily due to overlap from a heavy oil range product. |
| E | Estimated value. The reported value exceeds the calibration range of the analysis. |
| F | Analyte confirmation on secondary column |
| I-02 | This sample was analyzed outside of the recommended holding time. |
| J | Analyte concentration is below calibration range |
| Q-02 | The spike recovery for this QC sample is outside of NCA established control limits due to sample matrix interference. |
| Q-16 | The RPD and/or percent recovery for this QC spike sample cannot be accurately calculated due to interference from coeluting organic compounds present in the sample. |
| S-01 | The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences. |
| S-03 | The surrogate recovery for this sample is outside of established control limits. Review of associated QC indicates the recovery for this surrogate does not represent an out-of-control condition. |
| S-04 | The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect. |
| X | See case narrative. |
| 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 |
| RPD | Relative Percent Difference |

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10 June 2005

Jay Lucas
Geo Engineers - Seattle
600 Stewart St, Suite 1700
Seattle, WA/USA 98101

RE: R.G. Haley International Corporation Site

Enclosed are the results of analyses for samples received by the laboratory on 05/27/05 09:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott A. Woerman For Jeff Gerdes
Project Manager

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907.563.9200 fax 907.563.9210

| | | |
|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1700 | Project Number: 0275-002-01 | **Reported:** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | 06/10/05 14:25 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| TL-MW-2 | B5E0844-01 | Other wet | 05/26/05 16:30 | 05/27/05 09:30 |





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|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1700 | Project Number: 0275-002-01 | **Reported:** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | 06/10/05 14:25 |

## Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **TL-MW-2 (B5E0844-01) Other wet** | **Sampled: 05/26/05 16:30** | | **Received: 05/27/05 09:30** | | | | | | |
| **Diesel Range Hydrocarbons** | **654000** | 20000 | mg/kg | 40 | 5F02056 | 06/02/05 | 06/06/05 | NWTPH-Dx | A-01 |
| Lube Oil Range Hydrocarbons | ND | 60000 | " | " | " | " | " | " | |
| *Surrogate: 2-FBP* | *ND* | *50-150* | | | " | " | " | " | *S-01* |
| *Surrogate: Octacosane* | *ND* | *50-150* | | | " | " | " | " | *S-01* |





Scott A. Woerman For Jeff Gerdes, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1700 | Project Number: 0275-002-01 | **Reported:** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | 06/10/05 14:25 |

## Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 5F02056: Prepared 06/02/05 Using EPA 3580A** | | | | | | | | | | |
| **Blank (5F02056-BLK1)** | | | | | | | | | | |
| Diesel Range Hydrocarbons | ND | 500 | mg/kg | | | | | | | |
| Lube Oil Range Hydrocarbons | ND | 1500 | " | | | | | | | |
| *Surrogate: 2-FBP* | *641* | | *"* | *625* | | *103* | *50-150* | | | |
| *Surrogate: Octacosane* | *653* | | *"* | *625* | | *104* | *50-150* | | | |
| **LCS (5F02056-BS1)** | | | | | | | | | | |
| Diesel Range Hydrocarbons | 4840 | 500 | mg/kg | 5000 | | 96.8 | 61-120 | | | |
| *Surrogate: 2-FBP* | *701* | | *"* | *625* | | *112* | *50-150* | | | |
| **LCS (5F02056-BS2)** | | | | | | | | | | |
| Lube Oil Range Hydrocarbons | 5070 | 1500 | mg/kg | 5000 | | 101 | 50-150 | | | |
| *Surrogate: Octacosane* | *739* | | *"* | *625* | | *118* | *50-150* | | | |
| **LCS Dup (5F02056-BSD1)** | | | | | | | | | | |
| Diesel Range Hydrocarbons | 4850 | 500 | mg/kg | 5000 | | 97.0 | 61-120 | 0.206 | 40 | |
| *Surrogate: 2-FBP* | *703* | | *"* | *625* | | *112* | *50-150* | | | |
| **LCS Dup (5F02056-BSD2)** | | | | | | | | | | |
| Lube Oil Range Hydrocarbons | 5290 | 1500 | mg/kg | 5000 | | 106 | 50-150 | 4.25 | 50 | |
| *Surrogate: Octacosane* | *728* | | *"* | *625* | | *116* | *50-150* | | | |
| **Duplicate (5F02056-DUP1)** | | | | | **Source: B5E0844-01** | | | | | |
| Diesel Range Hydrocarbons | 581000 | 20000 | mg/kg | | 654000 | | | 11.8 | 50 | |
| Lube Oil Range Hydrocarbons | 14100 | 60000 | " | | 15900 | | | 12.0 | 50 | |
| *Surrogate: 2-FBP* | *ND* | | *"* | *625* | | *ND* | *50-150* | | | *S-01* |
| *Surrogate: Octacosane* | *ND* | | *"* | *625* | | *ND* | *50-150* | | | *S-01* |





Scott A. Woerman For Jeff Gerdes, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Seattle | Project: R.G. Haley International Corporation Site | |
| 600 Stewart St, Suite 1700 | Project Number: 0275-002-01 | **Reported:** |
| Seattle, WA/USA 98101 | Project Manager: Jay Lucas | 06/10/05 14:25 |

## Notes and Definitions

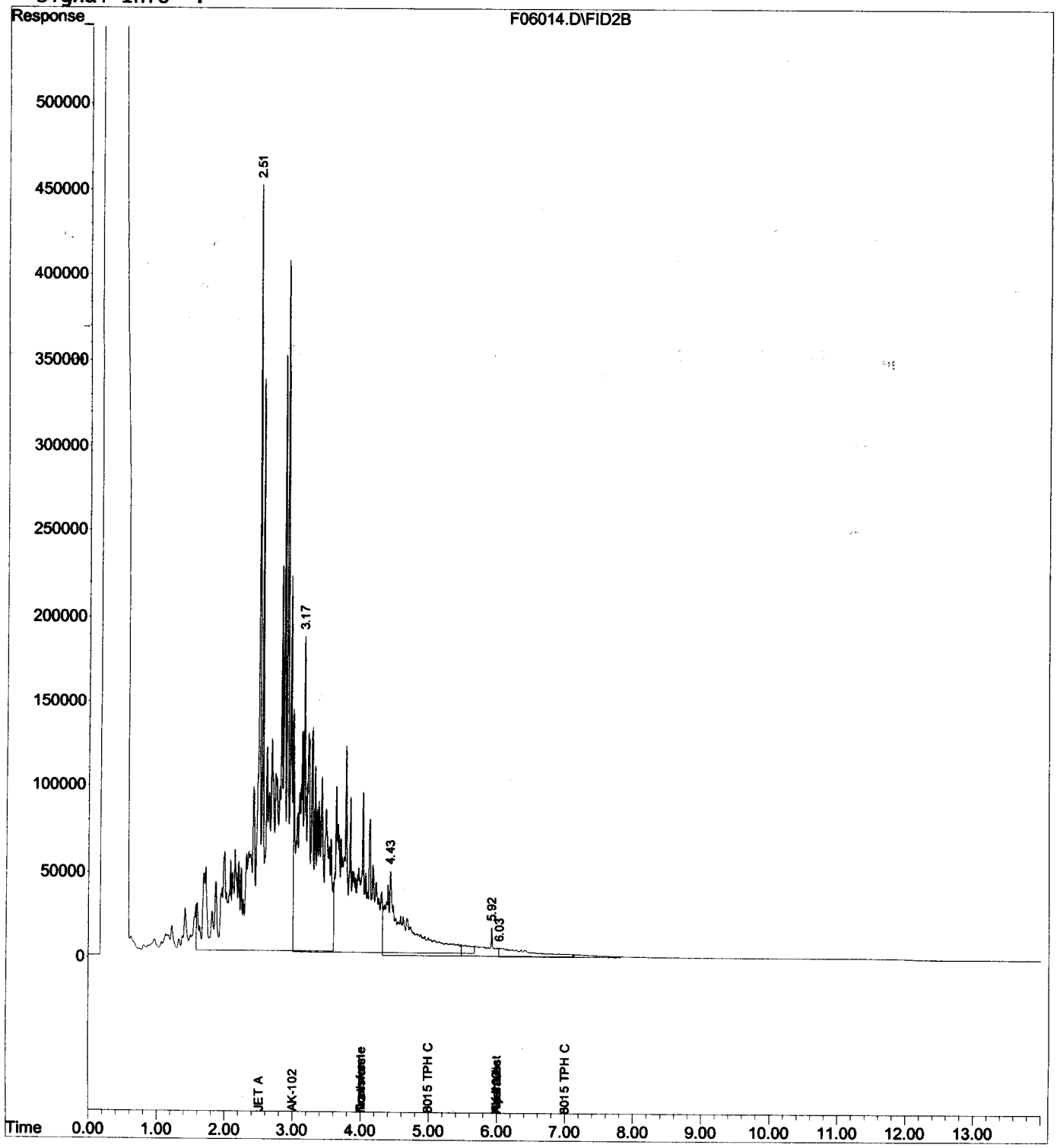
| | |
|---|---|
| A-01 | Chromatogram closely resembles the P9 site standard. |
| S-01 | The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences. |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |

Quantitation Report (QT Reviewed)

Data File : F:\HPCHEM\1\DATA\060605.SEC\F06014.D Vial: 57
Acq On : 6 Jun 2005 15:48 Operator: tmk
Sample : B5E0844-01 Inst : GC-7
Misc : 40X NWDX SG S RS1 SITE STDS Multiplr: 1.00
IntFile : TPH.E
Quant Time: Jun 7 15:18 2005 Quant Results File: TRC2205C.RES

Quant Method : D:\HPCHEM\1\METHODS\TRC2205C.M (Chemstation Integrator)
Title : GC#7 TPH-Dx Rear Column
Last Update : Tue May 10 15:58:33 2005
Response via : Multiple Level Calibration
DataAcq Meth : TFE1805.M

Volume Inj. :
Signal Phase :
Signal Info :



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11922 E 1st Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290 [ ]
9405 SW Nimbus Ave, Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210 [ ]
20332 Empire Ave, Ste F1, Bend, OR 97701-5712 541-383-9310 FAX 382-7588 [ ]
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210 [ ]

# CHAIN OF CUSTODY REPORT

Work Order #: 0505044

NCA CLIENT: GeoEngineers
REPORT TO: Jay Lucas
ADDRESS: GEI SEATTLE
PHONE: 206 728 2674 FAX: 206 728 2732

INVOICE TO: SAME
P.O. NUMBER: 0275-002-01 T11

PROJECT NAME: Haley
PROJECT NUMBER: 0275-002-01
SAMPLED BY: Ron Bek

TURNAROUND REQUEST
in Business Days *
Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1
Petroleum Hydrocarbon Analyses: [X] STD. | 4 | 3 | 2 | 1 | <1
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | PRESERVATIVE: ice | REQUESTED ANALYSES: NWTPH-Dx | MATRIX (W, S, O) | # OF CONT. | LOCATION / COMMENTS | NCA WO ID |
|---|---|---|---|---|---|---|---|---|
| 1 | TL-MW-2 | 5/26/05 1630 | | X | W | 2 | | 01 |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

RELEASED BY: Ron Bek — DATE: 5/26/05
PRINT NAME: Ron Bek — FIRM: GEI — TIME: 1400

RECEIVED BY: Tom Blankinship — DATE: 5/27/05
PRINT NAME: Blankinship — FIRM: NCA — TIME: 0930

RELEASED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

RECEIVED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS: PRODUCT SAMPLES

TEMP: 7.9 w/ICE

COC REV 09/04

PAGE 1 OF 1

Samples were not @2-6c upon receipt!

# APPENDIX K
## Groundwater Chemistry

# Table K-1

## Groundwater General Chemistry

R.G. Haley Site

Bellingham, Washington

| Monitoring Well | Screen Interval (feet bgs) | Date Measured | pH | Conductivity (µS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/l) | Temperature (degrees C) | ReDox Potential (millivolts)[2] | Salinity (%) | Salinity (g/kg) | Ferrous Iron (mg/l)[2] | Soluble Manganese (mg/l) | Nitrate-Nitrogen (mg/l as N) | Sulfate (mg/l) | Total Dissolved Solids (g/L) | Dissolved Inorganic Carbon (mg/l) | Total Organic Carbon (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CL-MW-1 | 3-11 | 06/24/04 | 6.3 | 51,000 | -- | 1.4 | 12.4 | -85 | 0 | -- | 1.68 | 0 | <0.01 | ND | -- | 53.3 | 48.4 |
| CL-MW-1 | 3-11 | 05/09/12 | 6.34 | 404 | 25.00 | 1.12 | 10.8 | -52 | -- | -- | -- | -- | -- | -- | 0.26 | -- | -- |
| CL-MW-1D | 12-15 | 06/22/04 | 7.1 | 24,000 | -- | 2.2 | 12.8 | -139 | 0 | -- | 1.41 | 0.7 | <0.01 | 0.758 | -- | 27 | 16.1 |
| CL-MW-1H | 8.7-11.7 | 06/24/04 | 6.4 | 35,000 | -- | 2 | 14.6 | -74 | 0 | -- | 1.31 | 0.2 | 0.0138 | 5.84 | -- | 28.8 | 9.24 |
| CL-MW-1H | 8.7-11.7 | 05/09/12 | 6.55 | 422 | 2.00 | 0.98 | 11.6 | -69 | -- | -- | -- | -- | -- | -- | 0.27 | -- | -- |
| CL-MW-1S | 7-10 | 06/22/04 | 7.2 | 50,000 | -- | 2.1 | 13.9 | -167 | 0 | -- | Too Turbid for Measurements | | <0.01 | ND | -- | 56.6 | 32.2 |
| CL-MW-6 | 4.6-14.6 | 06/24/04 | 6.2 | 37,000 | -- | 1.70 | 13.6 | -72 | 0 | -- | 1.27 | 0 | <0.01 | 0.867 | | 31.3 | 12.1 |
| CL-MW-6 | 4.6-14.6 | 05/09/12 | 6.49 | 460 | 9.00 | 1.01 | 10.8 | -70 | -- | -- | -- | -- | -- | -- | 0.29 | -- | -- |
| CL-MW-7 | 5-15 | 06/24/04 | 5.8 | 72,000 | -- | 1.80 | 13.5 | -85 | 0 | -- | 1.95 | 0 | <0.01 | ND | | 107 | 31.8 |
| CL-MW-9 | 1.5-10 | 05/09/12 | 5.95 | 276 | 8.30 | 1.09 | 10.6 | -70 | -- | -- | -- | -- | -- | -- | 0.18 | -- | -- |
| CL-MW-101 | 4.4-9.4 | 07/18/12 | 6.14 | 587 | 7.20 | 7.13 | 16.3 | -116 | 0 | -- | -- | -- | -- | -- | 0.38 | -- | -- |
| CL-MW-102 | 4-8 | 07/18/12 | 5.81 | 468 | 8.20 | 7.61 | 14.4 | -64 | 0 | -- | -- | -- | -- | -- | 0.3 | -- | -- |
| CL-MW-103 | 3-14.9 | 07/18/12 | 6.16 | 771 | 23.20 | 7.87 | 13.3 | -119 | 0 | -- | -- | -- | -- | -- | 0.5 | -- | -- |
| HS-MW-2 | 8.5-13.5 | 06/24/04 | 6.0 | 24,000 | -- | 1.9 | 13.8 | -94 | 0 | -- | 2.3 | 0 | <0.01 | ND | -- | 31.8 | 16.5 |
| HS-MW-4 | 3-13 | 06/23/04 | 6.6 | 130 | -- | 2.3 | 14 | -73 | 0.1 | -- | Too Turbid for Measurements | | <0.01 | 0.658 | -- | 140 | 72.6 |
| HS-MW-4 | 3-13 | 05/09/12 | 6.41 | 1,010 | 430* | 0.8 | 12.6 | -69 | 0 | -- | -- | -- | -- | -- | 0.6 | -- | -- |
| HS-MW-5 | 3-13 | 06/23/04 | 7.5 | 62,000 | | 2.1 | 13.5 | -110 | 0 | -- | 0.1 | 0 | <0.01 | 18.7 | | 63.6 | 9.76 |
| HS-MW-5 | 3-13 | 05/09/12 | 6.52 | 631 | 13.60 | 0.9 | 11.6 | -150 | 0 | -- | | | | | 0.4 | -- | -- |
| HS-MW-6 | 4-19 | 06/24/04 | 5.7 | 50,000 | | 2.1 | 12.1 | -32 | 0 | -- | 2.16 | 0.2 | <0.01 | 1.3 | | 52.2 | 25.2 |
| HS-MW-6 | 4-19 | 05/08/12 | 6.31 | 796 | 8.00 | 1.12 | 11 | -36 | -- | -- | -- | -- | -- | -- | 0.5 | -- | -- |
| HS-MW-6 | 4-19 | 07/18/12 | -- | 697 | -- | -- | 11.62 | -- | -- | -- | -- | -- | -- | -- | | -- | -- |
| HS-MW-7 | 4-19 | 05/09/12 | 6.45 | 828 | 10.00 | 1.01 | 11.4 | -84 | -- | -- | -- | -- | -- | -- | 0.53 | -- | -- |
| HS-MW-7 | 4-19 | 07/18/12 | -- | 657 | -- | -- | 12.81 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HS-MW-9 | 3-13 | 06/23/04 | 6.3 | 100 | | 1.8 | 13.6 | -31 | 0 | -- | 2.05 | 0.2 | <0.01 | 0.44 | -- | 144 | 75.9 |
| HS-MW-9 | 3-13 | 05/09/12 | 5.83 | 814 | 12.20 | 0.7 | 11.3 | -104 | 0 | -- | -- | -- | -- | -- | 0.52 | -- | -- |
| HS-MW-9 | 3-13 | 07/18/12 | -- | 14 | -- | -- | 13.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| HS-MW-10 | 10-13 | 06/23/04 | 6.6 | 18,000 | -- | 4.2 | 12.9 | -99 | 0 | 0.100 | 0.59 | 0.2 | <0.01 | ND | -- | 22.9 | 10.8 |
| HS-MW-11 | 8-11 | 06/23/04 | 6 | 70,000 | -- | 1.6 | 15.4 | -88 | 0 | 0.300 | 1.08 | 0.3 | <0.01 | 1.31 | -- | 105 | 80.6 |
| HS-MW-13 | 8-11.5 | 06/23/04 | 6.1 | 140 | -- | 1.9 | 12 | -89 | 0.1 | 0.500 | 1.11 | 0 | <0.01 | 1.24 | -- | 150 | 94.2 |
| HS-MW-13D | 8-11.5 | 05/09/12 | 6.12 | 351 | 57.70 | 0.7 | 10.1 | -70 | 0 | -- | -- | -- | -- | -- | 0.22 | -- | -- |
| HS-MW-15 | 8-11 | 06/22/04 | 6.5 | 2,800 | -- | 2.1 | 14.3 | -243 | 1.7 | -- | 1.74 | Note 1 | <0.01 | 1350 | -- | 53 | 20.5 |
| HS-MW-15 | 8-11 | 05/09/12 | 6.39 | 5,270 | 87.30 | 0.8 | 11.1 | -304 | 0.3 | -- | -- | -- | -- | -- | 3.3 | -- | -- |
| HS-MW-16 | 8-11 | 06/22/04 | 6.6 | 3,600 | -- | 1.9 | 13.6 | -170 | 2.3 | -- | 3.4 | 0.5 | 0.0194 | 1980 | | 41.3 | 14 |
| HS-MW-16 | 8-11 | 05/09/12 | 6.11 | 290 | 18.50 | 0.9 | 11.4 | -247 | 0.1 | -- | -- | -- | -- | -- | 1.9 | -- | -- |
| HS-MW-17 | 3.2-13 | 07/18/12 | 6.3 | 4,000 | 8.31 | 7.54 | 15 | -161 | 0.2 | -- | -- | -- | -- | -- | 2.6 | -- | -- |
| HS-MW-19 | 2.7-12.7 | 07/17/12 | 6.12 | 673 | 8.20 | 8.12 | 14.9 | -110 | 0 | -- | -- | -- | -- | -- | 0.43 | -- | -- |
| IZ-MW-1 | 2-5 | 06/22/04 | 6 | 2,100 | -- | 1.5 | 16.6 | -317 | 1.3 | -- | 0.12 | 0 | <0.01 | 625 | -- | 173 | 57.2 |
| IZ-MW-2 | 2-5 | 06/22/04 | 6.7 | 2,300 | -- | 1.8 | 14.9 | -351 | 1.4 | -- | 0.2 | 0 | <0.01 | 668 | -- | 166 | 57 |
| IZ-MW-3 | 2-5 | 06/22/04 | 7.1 | 2,700 | -- | 1.7 | 16.7 | -333 | 1.7 | -- | 0.2 | 0 | <0.01 | 934 | -- | 120 | 46.6 |
| IZ-MW-4 | 2-5 | 06/22/04 | 6 | 470 | -- | 3.2 | 13.3 | -275 | 0.2 | -- | 0.07 | 0 | <0.01 | 71.5 | -- | 127 | 65.4 |
| TL-MW-1 | 4-19 | 05/08/12 | 6.1 | 2,400 | 101.00 | 0.8 | 11 | -161 | 0.1 | -- | -- | -- | -- | -- | 1.5 | -- | -- |
| TL-MW-1 | 4-19 | 07/18/12 | -- | 3,292 | -- | -- | 11.25 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TL-MW-7 | 3-19 | 05/09/12 | 6.51 | 1,080 | 27.00 | 0.98 | 10.7 | -76 | -- | -- | -- | -- | -- | -- | 0.7 | -- | -- |
| TL-MW-9 | 3-14 | 06/23/04 | 6.1 | 1,500 | -- | 1.7 | 13.3 | -107 | 0.9 | -- | 1.69 | 0 | <0.01 | 455 | -- | 87.1 | 41.9 |
| TL-MW-9 | 3-14 | 05/08/12 | 6.4 | 16,700 | 21.50 | 0.5 | 9.9 | -82 | 0.9 | -- | -- | -- | -- | -- | 10 | -- | -- |

| Monitoring Well | Screen Interval (feet bgs) | Date Measured | pH | Conductivity (µS/cm) | Turbidity (NTU) | Dissolved Oxygen (mg/l) | Temperature (degrees C) | ReDox Potential (millivolts)[2] | Salinity (%) | Salinity (g/kg) | Ferrous Iron (mg/l)[2] | Soluble Manganese (mg/l) | Nitrate-Nitrogen (mg/l as N) | Sulfate (mg/l) | Total Dissolved Solids (g/L) | Dissolved Inorganic Carbon (mg/l) | Total Organic Carbon (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TL-MW-10 | 10-13 | 06/23/04 | 5.9 | 2,300 | -- | 2 | 11.3 | -243 | 1.3 | -- | 1.56 | 0.3 | <0.01 | 326 | -- | 238 | 98.5 |
| TL-MW-11 | 17-20 | 06/22/04 | 6.6 | 110 | -- | 5.3 | 15.8 | -121 | 0 | -- | 2.87 | 0 | <0.01 | 2.65 | -- | 130 | 37 |
| TL-MW-11 | 17-20 | 05/08/12 | 6.28 | 1,050 | 12.70 | 1.06 | 11.3 | -62 | -- | -- | -- | -- | -- | -- | 0.7 | -- | -- |
| TL-MW-12 | 2.7-12.7 | 07/11/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| TL-MW-12 | 2.7-12.7 | 07/18/12 | 5.98 | 2,900 | 8.20 | 7.93 | 12.1 | -138 | 0.1 | -- | -- | -- | -- | -- | 1.8 | -- | -- |
| TL-MW-13 | 43.1-46.1 | 07/12/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| TL-MW-13 | 43.1-46.1 | 07/17/12 | 6.37 | 2,800 | 14.30 | 7.33 | 14.7 | -149 | 0.1 | -- | -- | -- | -- | -- | 1.7 | -- | -- |
| TL-MW-14 | 27.3-30.1 | 07/12/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| TL-MW-14 | 27.3-30.1 | 07/17/12 | 6.08 | 12,100 | 128.20 | 8.13 | 14.4 | -58 | 0.7 | -- | -- | -- | -- | -- | 8 | -- | -- |
| TL-MW-15 | 27.3-30.1 | 07/12/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| TL-MW-15 | 27.3-30.1 | 07/18/12 | 5.87 | 550 | 9.80 | 7.51 | 13.3 | -65 | 0.3 | -- | -- | -- | -- | -- | 3.6 | -- | -- |
| TL-MW-16 | 29.7-32.5 | 07/12/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| TL-MW-16 | 29.7-32.5 | 07/17/12 | 6.12 | 320 | 4.30 | 7.62 | 13.5 | -179 | 0.2 | -- | -- | -- | -- | -- | 2 | -- | -- |

**Notes:**

[1] Obvious color change during test but instrument read a negative value.

-- Not measured. Typically not measured if LNAPL present.

* Light non-aqueous phase liquid in sample.

pH, conductivity, dissolved oxygen, temperature, Redox, salinity, ferrous iron and soluble maganese field measurements with HoribaU-22

Salinity by Method SM 2520, analyzed by North Creek Analytical, Inc or field tested with HoribaU-22.

Nitrate-Nitrogen by EPA Method 353.2, analyzed by North Creek Analytical, Inc.

Sulfate by EPA Method 300.0, analyzed by North Creek Analytical, Inc.

Dissolved inorganic carbon and total organic carbon by EPA Method 415.1, analyzed by North Creek Analytical, Inc.

# Table K-2

## 2012 Groundwater Analytical Data for Dioxins/Furans

R.G. Haley Site

Bellingham, Washington

| | Monitoring Well and Sample Date (Units in pg/L) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CL-MW-101_07182012 | | HS-MW-13-05092012 | | HS-MW-15-05092012 | | TL-MW-11-05082012 | | TL-MW-16_07172012 | |
| **Parameter** | **Result** | **Qualifier** | **Result** | **Qualifier** | **Result** | **Qualifier** | **Result** | **Qualifier** | **Result** | **Qualifier** |
| 1,2,3,4,6,7,8-HpCDD | 120 | | 1600 | | 303 | | 10600 | | 196 | |
| 1,2,3,4,6,7,8-HpCDF | 8.26 | J | 311 | | 63.6 | | 1380 | | 24.2 | J |
| 1,2,3,4,7,8,9-HpCDF | 0.930 | J | 21.6 | J | 3.34 | U | 84.7 | | 2.31 | U |
| 1,2,3,4,7,8-HxCDD | 0.808 | J | 0.580 | U | 4.29 | U | 5.88 | J | 1.62 | J |
| 1,2,3,4,7,8-HxCDF | 0.756 | U | 23.0 | J | 3.78 | J | 109 | | 0.782 | J |
| 1,2,3,6,7,8-HxCDD | 2.16 | U | 55.0 | | 10.4 | J | 527 | | 4.12 | J |
| 1,2,3,6,7,8-HxCDF | 0.382 | U | 5.12 | J | 8.00 | U | 30.5 | J | 0.272 | U |
| 1,2,3,7,8,9-HxCDD | 1.94 | J | 3.58 | U | 1.48 | U | 23.8 | U | 1.76 | U |
| 1,2,3,7,8,9-HxCDF | 0.336 | U | 9.10 | J | 10.9 | U | 58.9 | | 2.75 | U |
| 1,2,3,7,8-PeCDD | 0.370 | U | 2.00 | U | 0.560 | U | 2.56 | U | 2.65 | U |
| 1,2,3,7,8-PeCDF | 0.338 | U | 5.20 | J | 2.61 | U | 28.5 | J | 0.514 | J |
| 2,3,4,6,7,8-HxCDF | 0.446 | U | 11.1 | J | 2.18 | U | 70.1 | | 0.222 | U |
| 2,3,4,7,8-PeCDF | 0.396 | U | 4.96 | J | 1.98 | U | 25.0 | J | 0.635 | U |
| 2,3,7,8-TCDD | 2.43 | U | 3.25 | U | 2.92 | U | 3.56 | U | 2.42 | U |
| 2,3,7,8-TCDF | 0.198 | U | 1.30 | U | 0.861 | U | 10.1 | | 1.32 | U |
| OCDD | 2450 | | 16500 | | 2550 | | 90700 | | 2910 | |
| OCDF | 61.9 | J | 1700 | | 347 | | 5350 | | 222 | |
| Total HpCDD | 289 | | 2790 | | 515 | | 17800 | | 440 | |
| Total HpCDF | 31.7 | | 1610 | | 303 | | 6370 | | 134 | |
| Total HxCDD | 4.94 | | 159 | | 27.6 | | 1360 | | 43.9 | |
| Total HxCDF | 8.06 | | 556 | | 96.5 | | 3080 | | 20.8 | |
| Total PeCDD | 50 | U | 2 | U | 50 | U | 5.84 | | 2.24 | |
| Total PeCDF | 2.14 | | 88.7 | | 2.61 | U | 572 | | 0.52 | |
| Total TCDD | 0.302 | | 0.5 | | 2.92 | U | 4.52 | | 2.42 | U |
| Total TCDF | 10 | U | 10 | U | 0.861 | U | 37.8 | | 1.32 | U |
| **Approximate Concentration of Total Dioxins and Furans[1] (pg/L)** | **2,848** | | **23,404** | | **3,839** | | **125,280** | | **3,773** | |

### Notes

1. Sum of 8 total homolog groups, OCDD and OCDF. Non detects are treated as zero (0) in this sum.

pg/L = picograms per liter

U = Not Detected

J = Estimated

# APPENDIX L
## Chemical Data Validation Reports

# Table of Contents

# APPENDIX L
# CHEMICAL DATA VALIDATION REPORTS

This report presents the results of a United States Environmental Protection Agency (USEPA) defined Stage 2A validation (USEPA Document 540-R-08-005; USEPA 2009) of analytical data from the analyses of soil and groundwater samples obtained from the Supplemental Upland Investigation at the RG Haley Site. The sample delivery groups (SDGs) were validated in accordance with the stated Data Quality Objectives (DQOs) in the Final Quality Assurance Project Plan (QAPP) (GeoEngineers 2012a). Samples obtained were submitted to OnSite Environmental, Inc. (OnSite) of Redmond, Washington for chemical analysis of BTEX compounds, diesel- and heavy oil-range petroleum hydrocarbons (NWTPH-Dx), semi-volatile compounds, polycyclic aromatic hydrocarbons (PAHs), chlorophenols, dissolved metals (copper) and/or dioxins/furans. Samples obtained specifically for the analysis of dioxin/furans were submitted to Analytical Resources, Incorporated (ARI) of Tukwila, Washington under chain of custody protocol.

The objective of the data quality assessment was to review laboratory analytical procedures and laboratory and field quality control (QC) results to evaluate whether the samples were analyzed using well-defined and acceptable methods that provide quantitation limits below applicable regulatory criteria, the precision and accuracy of the data are well defined and sufficient to provide defensible data, and the quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards.

OnSite SDGs (noted above) were reviewed relative to the following QC elements:

- Chain of Custody
- Holding Times
- Surrogates/Labeled Compounds
- Method and Equipment Rinsate Blanks
- Laboratory Control Samples/Ongoing Precision and Recovery Samples
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory and Field Duplicates

## 1.0 DATA QUALITY ASSESSMENT SUMMARY – 2012 SUPPLEMENTAL INVESTIGATION

The results for each of the QC elements are summarized below. The data assessment was performed using guidance in two USEPA documents: USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA 2010), USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA 2008), and USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review (USEPA 2011).

### 1.1. Chain-of-Custody Documentation

Chain-of-custody forms were provided with the laboratory analytical reports. No transcription errors were found, and the appropriate signatures were applied. There were no anomalies mentioned in the sample receipt forms, as the samples were transported to the laboratory at the appropriate temperatures of between 2 and 6 degrees Celsius.

### 1.2. Holding Times

The holding time is defined as the time that elapses between sample collection and sample extraction. Maximum holding time criteria exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Established holding times were met for all analyses.

### 1.3. Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added at a known concentration and percent recoveries are calculated following analysis.

In the Dioxin/Furan analyses, the surrogates (labeled compounds) serve as an isotopic dilution quantitation mechanism for the calculation of all target analytes in the method. Like all other surrogates, the labeled compounds have method control limits based on percent recovery that the laboratory is obligated to accommodate. However, the exact amount of a recovered labeled compound can directly affect the measurement of the target analyte that it represents.

All surrogate recoveries for field samples were within the laboratory control limits, with the exceptions below:

- SDG 1206-168 (NWTPH-Dx): There was no recovery of surrogates in Samples CL-SB-102-9-10 and CL-SB-103-8-9 because the laboratory diluted the samples at least 10 times. In each case, the surrogates were diluted outside of the linear calibration range of the instrument. No action is necessary.

  (Semivolatiles): The percent recovery (%R) value for the surrogate 2-fluorobiphenyl in Sample CL-SB-103-8-9 exceeded the control limit. No qualification for this outlier is necessary because the base-neutral fraction target analytes were represented by at least 2 other surrogates that demonstrated %R values within their respective control limits. No action is necessary.

  (Chlorophenols): There was no recovery of surrogates in Samples CL-SB-101-4-5, CL-SB-101-6-7, CL-SB-102-4-5, CL-SB-102-9-10, CL-SB-103-4-5, and CL-SB-103-8-9, because the laboratory diluted the samples at least 10 times. In each case, the surrogates were diluted outside of the linear calibration range of the instrument. No action is necessary.

  (Dioxins/Furans): The %R values for the labeled compounds 13C-1,2,3,6,7,8-HxCDD, 13C-1,2,3,6,7,8-HxCDF, and 13C-1,2,3,4,6,7,8-HpCDD in Sample HS-SB-102-0-1 were greater than their respective control limits. The positive results for the associated target analytes were qualified as estimated (J) in this sample.

- SDG 1207-021 (NWTPH-Dx, Chlorophenols, and Semivolatiles): There was no recovery of surrogates in Sample TL-MW-13-11-12 because the laboratory diluted the sample at least 10 times. In this case, the surrogate was diluted outside of the linear calibration range of the instrument. No action is necessary.
- SDG 1207-026 (NWTPH-Dx, and Semivolatiles): There was no recovery of surrogates in Sample TL-MW-14-11-12 because the laboratory diluted the sample at least 10 times. In this case, the surrogate was diluted outside of the linear calibration range of the instrument. No action is necessary.
- SDG 1207-097 (NWTPH-Dx): There was no was no recovery of surrogates in Sample CL-MW-103-10-11.5 because the laboratory diluted the sample at least 10 times. In this case, the surrogate was diluted outside of the linear calibration range of the instrument. No action is necessary.

  (Chlorophenols): There was no was no recovery of surrogates in Sample CL-MW-103-5-6.5 because the laboratory diluted the sample at least 10 times. In this case, the surrogate was diluted outside of the linear calibration range of the instrument. No action is necessary.

  (Semivolatiles): The %R values for the surrogate 2,4,6-tribromophenol in Samples CL-MW-103-10-11.5, HS-MW-19-10-11.5, and HS-MW-18-7.5-9 exceeded the control limits. No qualification for this outlier is necessary because the base-neutral fraction target analytes were represented by at least 2 other surrogates that demonstrated %R values within their respective control limits.

  (Dioxins/Furans): The %R values for the labeled compounds 13C-1,2,3,4,6,7,8-HpCDD and OCDD in Sample HS-MW-19-1.5-2.5 were greater than their respective control limits. The positive results for the associated target analytes were qualified as estimated (J) in this sample.

### 1.4. Method Blanks and Equipment Rinsate Blanks

Method blanks are analyzed to ensure that laboratory procedures and re-agents do not introduce measurable concentrations of the analytes of interest. Method blanks were analyzed with each batch of samples, at a frequency of one per twenty samples. For all sample batches, method blanks for all applicable methods were analyzed at the required frequency. None of the analytes of interest were detected above the contract required quantitation limits (CRQL), or 3 times these limits for OCDD or OCDF, in any of the method blanks, with the exceptions below:

- SDG 1207-097 (Dioxins/Furans): There were positive results for 1,2,3,4,6,7,8-HpCDD and OCDD (3 times the CRQL) in the method blank extracted on July 25, 2012. The positive result for OCDD was exceedingly high, and judged to be considered gross contamination. The associated field sample HS-MW-19-1.5-2.5 reported positive results for these compounds at levels greater than the CRQL. The positive result for 1,2,3,4,6,7,8-HpCDD was qualified as estimated (J) in this sample. The positive result for OCDD was rejected (R) because of the gross contamination in the method blank.
- SDG 1207-143 (Dioxins/Furans): There were positive results for 1,2,3,4,6,7,8-HpCDD and OCDD (3 times the CRQL) in the method blank extracted on July 24, 2012. The associated field samples CL-MW-101 and TL-MW-16 reported positive results for these compounds at levels

greater than the CRQL The positive results for these congeners were qualified as estimated (J) in this sample.

Equipment rinsate blanks are analyzed to provide an indication as to whether field decontamination and sampling procedures effectively prevent cross-contamination in field activities. Two equipment rinsate blanks were collected for the upland sampling efforts, RINSE-05082012 and RINSE-05092012.

- SDG 1205-090 (Semivolatiles): There were positive results for acenaphthene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene in the equipment blank RINSE-05082012 at concentrations greater than the contract required quantitation limit. The associated field samples HS-MW-6-05082012, TL-MW-1-05082012, TL-MW-11-05082012, and TL-MW-9-05082012 reported positive results for these compounds at levels greater than the CRQL. However, all the field sample concentrations were greater than 10 times the concentrations in the field blank. No further action was required.

  There were positive results for naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene in the equipment blank RINSE-05092012 at concentrations greater than the contract required quantitation limit. The associated field samples CL-MW-1-05092012, CL-MW-9-05092012, HS-MW-9-05092012, HS-MW-15-05092012, and HS-MW-16-05092012, TL-MW-7-05092012, and DUP-05092012 reported positive results for these compounds at levels greater than the CRQL. In these cases, the positive results were transformed into reporting limits at elevated levels and reported as Not Detected.

### 1.5. Matrix Spikes/Matrix Spike Duplicates

Because the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis. One aliquot of sample is analyzed in the normal manner, and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a %R is calculated. Matrix spike duplicates (MSD) analyses are generally performed for organic analyses as a precision check. For some organic analytical methods, such as NWTPH-Dx, a laboratory control sample/laboratory control sample duplicate (LCS/LCSD) sample set is performed in lieu of a MS/MSD analysis.

For inorganics methods, the matrix spike (referred to as a “spiked sample”) is typically followed by a post spike sample if any element recoveries were outside the control limits in the “spike sample.”

Matrix spike analyses should be performed once per analytical batch or every twenty field samples, whichever is more frequent. The recovery criteria for matrix spikes and laboratory control samples are specified in the laboratory documents as are the relative percent difference (RPD) values. The frequency requirements were met for all analyses and the %R/RPD values were within the proper control limits, with the exceptions below:

- SDG 1207-097 (Metals): The laboratory performed an MS/MSD set on Sample HS-MW-19-10-11.5. The MSD %R value for copper exceeded the control limit. However, the corresponding MS %R value for copper was within the respective control limit. For this reason, no qualifiers due to accuracy were required.

The RPD value for copper exceeded the control limit in the same QC sample set. For this reason, the positive result for copper was qualified as estimated (J) in the parent sample due to a lack of precision.

### 1.6. Laboratory Control Samples/Ongoing Precision and Recovery Samples (OPR)

A laboratory control sample is essentially a blank sample that is spiked with a known amount of analyte concentration and analyzed. It is to be treated much like a matrix spike, without the possibility for matrix interference. As there is no actual sample matrix in the analysis, the analytical expectations for accuracy and precision are usually more rigorous and qualification would apply to all samples in the batch, instead of the parent sample only.

Laboratory control sample analyses should be performed once per analytical batch or every twenty field samples, whichever is more frequent. The recovery criteria for laboratory control samples are specified in the laboratory documents as are the RPD values. The frequency requirements were met for all analyses, and the %R/RPD values were within the proper control limits, with the exceptions below:

- SDG 1207-097 (Dioxins/Furans): The %R value for OCDD exceeded the control limit in the OPR sample extracted on July 25, 2012. The positive result for OCDD was qualified as estimated (J) in the associated field Sample HS-MW-19-1.5-2.5.
- SDG 1207-143 (Dioxins/Furans): The %R value for OCDD exceeded the control limit in the OPR sample extracted on July 24, 2012. The positive result for OCDD was qualified as estimated (J) in the associated field Samples CL-MW-101 and TL-MW-16.

### 1.7. Laboratory Duplicates (Metals and Fuels only)

Internal laboratory duplicate analyses are performed to monitor the precision of the analyses. Two separate aliquots of a sample are analyzed as distinct samples in the laboratory, and the RPD between the two results is calculated. Duplicate analyses should be performed once per analytical batch. If one or more of the samples used has a concentration greater than five times the reporting limit for that sample, the absolute difference is used instead of the RPD.

Laboratory duplicates were analyzed at the proper frequency and the specified acceptance criteria were met in all cases.

### 1.8. Field Replicates/Duplicates

Field duplicate samples were collected and analyzed along with the reviewed sample batches. The duplicate samples were analyzed for the same parameters as the associated parent samples. As mentioned above for the laboratory duplicates, the RPD is used as the criteria for assessing precision, unless one or more of the samples used has a concentration greater than five times the reporting limit for that sample in which case the absolute difference is used instead of the RPD.

The following field duplicate sample sets were analyzed for diesel-range and lube oil-range hydrocarbons and semivolatiles:

- CL-MW-9-05092012/DUP-05092012 and CL-MW-102-07182012/DUP-07182012

The RPD/absolute difference value for the field duplicate sample sets were within their respective control limits, with the following exceptions:

- SDG 1205-090: Because the RPD/absolute difference value for pentachlorophenol exceeded the control limits in sample set CL-MW-9-05092012/DUP-05092012, the results should be qualified as estimated ("J" flag) in both samples.

### 1.9. Reporting Limits

The laboratory indicated that several samples had evidence of matrix interference; in these cases the laboratory had to raise the reporting limits for various compounds in order to avoid reporting false positive results. Specifically, there were several instances where diesel-range or lube oil-range patterns could not be distinguished because of chromatographic interference and in these cases the laboratory raised the reporting limits, and indicated this with a "UI" qualifier. These data points were appropriately taken through the validation process, and these reporting limits were qualified (UI) in the GeoEngineers database.

In all sample analyses, the positive results for all target analytes were quantitated using instrument responses that were appropriately within the calibration curve used for that instrument. All data met the established criteria for this QC element with one exception below:

- SDG (Dioxins/Furans): The congeners 1,2,3,4,6,7,8-HpCDD and OCDD were reported to exceed the linear calibration range of the instrument in Sample HS-MW-19-1.5-2.5. The positive results for these congeners were qualified as estimated (J) in this sample.

### 1.10. Additional Data Quality Issues

- OnSite SDG 1205-090, 1207-026, 1207-097, 1207-143: Several congeners were flagged by the testing laboratory with an EMPC* because the ion abundance ratios were outside of the established criteria. In each of these cases the positive results were qualified (U) as not detected and the reporting limits were raised to the indicated level by the U qualifier.

A summary of congeners affected by these qualifiers are listed in the following table.

| Sample ID | Congeners |
|---|---|
| HS-MW-13-05092012 | 2,3,7,8-TCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,7,8,9-HxCDD |
| HS-MW-15-05092012 | 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDD, 2,3,4,6,7,8-HxCDF, 1,2,3,4,7,8,9-HpCDF |
| TL-MW-11-05082012 | 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDD |
| RINSE-05082012 | 2,3,7,8-TCDD |
| HS-SB-104-0-1 | 2,3,7,8-TCDD |
| TL-MW-14-15-16 | 2,3,7,8-TCDD |
| TL-MW-14-28-29 | 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDF |
| TL-MW-16-31-32 | 2,3,7,8-TCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,4,7,8,9-HpCDF |
| CL-MW-101_07182012 | 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF, 2,3,4,7,8-PeCDF, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,6,7,8-HxCDD |
| TL-MW-16_07172012 | 1,2,3,6,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,4,7,8,9-HpCDF |

- SDG 1206-189: The chromatographic patterns in Samples CL-SB-102-9-10, CL-SB-103-8-9, HS-SB-102-9-10, and HS-SB-103-8-9 did not match that of the calibration standards for lube oil. The positive results for lube oil in these samples would be biased high, and were qualified as estimated (J) for this reason.
- SDG 1206-190: The chromatographic patterns in Samples TL-SB-101-9-10 and TL-SB-101-19-20 did not match that of the calibration standards for diesel range hydrocarbons. The positive results for diesel range hydrocarbons in these samples would be biased high, and were qualified as estimated (J) for this reason.
- SDG 1206-230: The chromatographic pattern in Sample TL-MW-15-10-11 did not match that of the calibration standards for lube oil. The positive result for lube oil in this sample would be biased high, and was qualified as estimated (J) for this reason.
- SDG 1206-231: The chromatographic pattern in Sample TL-MW-16-20-21 did not match that of the calibration standards for diesel range hydrocarbons. The positive result for diesel range hydrocarbons in this sample would be biased high, and was qualified as estimated (J) for this reason.
- SDG 1206-231: The chromatographic pattern in Sample TL-MW-16-8-9 did not match that of the calibration standards for lube oil. The positive result for lube oil in this sample would be biased high, and was qualified as estimated (J) for this reason.
- SDG 1206-232: The chromatographic pattern in Sample CL-MW-101-6-7 did not match that of the calibration standards for diesel range hydrocarbons. The positive result for diesel range hydrocarbons in this sample would be biased high, and was qualified as estimated (J) for this reason.

- SDG 1207-097: The chromatographic patterns in Samples CL-MW-103-10-11.5, CL-MW-103-12.5-14, and HS-MW-19-12.5-14 did not match that of the calibration standards for diesel range hydrocarbons. The positive result for diesel range hydrocarbons in these samples would be biased high, and were qualified as estimated (J) for this reason.
- SDG 1207-097: The chromatographic pattern in Sample CL-MW-103-5-6.5 did not match that of the calibration standards for lube oil. The positive result for lube oil in this sample would be biased high, and was qualified as estimated (J) for this reason.
- SDG 1207-097: The column-confirmation RPD value for 2,4,6-trichlorophenol in Sample HS-MW-18-10-11.5 was reported by the laboratory to be greater than 40 percent, indicating a lack of acceptable precision within the analysis for this sample. For this reason, the positive result for 2,4,6-trichlorophenol was qualified as estimated (J) in this sample.
- SDG 1207-143: The chromatographic patterns in all the samples in this SDG did not match that of the calibration standards for diesel range hydrocarbons. The positive results for diesel range hydrocarbons in these samples would be biased high, and were qualified as estimated (J) for this reason.

## 2.0 OVERALL ASSESSMENT

As was determined by this data validation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the surrogates, labeled compounds, LCS/LCSD, and MS/MSD %R values, with the exceptions noted above. Precision was acceptable, as demonstrated by the laboratory duplicate, LCS/LCSD and MS/MSD RPD and absolute difference values, with the exceptions noted above.

Data should be qualified as estimated because of field duplicate precision, surrogate/labeled compound accuracy, method blank contamination, matrix spike precision outliers, ongoing precision and recovery outliers, chromatography mismatches, and column confirmation outliers. Data should also be qualified as not detected because of equipment blank contamination and HR/MS ion ratios outside of the appropriate control limits.

One data point was rejected because of exceedingly high contamination in the method blank.

The data collected in this supplemental investigation was validated using the Data Quality Objectives outlined in the QAPP. Based on the data quality review, it is our opinion that the analytical data, including data qualified as noted above, are of acceptable quality for their intended use.

# EXHIBIT L-1
## Draft Pre-2012 Data Quality Assessment

# DRAFT DATA QUALITY ASSESSMENT AND CHEMICAL ANALYTICAL DATA VOLUME II OF II R. G. HALEY INTERNATIONAL CORPORATION SITE BELLINGHAM, WASHINGTON AGREED ORDER NO. DE 2186

MARCH 13, 2006

FOR
DOUGLAS MANAGEMENT COMPANY

GeoEngineers

File No. 0275-002-01

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**APPENDICES**



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## ABBREVIATIONS

| | |
|---|---|
| AET | Apparent Effect Threshold |
| ASB | Aerated Stabilization Basin |
| APH | Air-Phase Petroleum Hydrocarbons |
| AST | Aboveground Storage Tank |
| BBCC | Bellingham Bay Coal Company |
| BEP | Bis (2-ethylhexyl) phthalate |
| BETX | Benzene, Ethylbenzene, Toluene, and Xylenes |
| BGS | Below Ground Surface |
| CCA | Chromated Copper Arsenate |
| CLARC | Cleanup Levels and Risk Calculations Volume 3.1 |
| COCs | Constituents of Concern |
| CORNWALL | Cornwall Avenue Landfill |
| cPAH | Carcinogenic Polycyclic Aromatic Hydrocarbons |
| CSL | Cleanup Screening Levels |
| CSM | Conceptual Site Model |
| CUL | Cleanup Level |
| DNR | Department of Natural Resources |
| DOUGLAS | Douglas Management Company |
| DQOs | Data Quality Objectives |
| Ecology | Washington State Department of Ecology |
| EDD | Electronic Data Deliverables |
| EPH | Extractable petroleum Hydrocarbon |
| FS | Feasibility Study |
| GP | Georgia Pacific |
| GPM | Gallons per Minute |
| HALEY | R.G. Haley International Corporation |
| HASP | Health and Safety Plan |
| HPLC | High Purity Liquid Chromatography |
| HVOC | Halogenated Volatile Organic Compound |
| IDL | Instrument Detection Limit |
| LCS/LCSD | Laboratory Control Spikes/Spike Duplicates |
| LNAPL | Light Non-Aqueous Petroleum Liquid |
| MADEP | Massachusetts Department of Environmental Protection |
| MDL | Method Detection Limit |
| MHHW | Mean Higher High Water |
| MLLW | Mean Lower Low Water |
| MS/MSD | Matrix Spike/Matrix Spike Duplicates |
| MTCA | Model Toxics Control Act |

| | |
|---|---|
| NPL | Superfund National Priorities List |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PARCC | Precision, Accuracy, Representativeness, Completeness and Comparability |
| PCB | Polychlorinated Biphenyl |
| PCP | Pentachlorophenol |
| PLP | Potentially Liable Person |
| PORT | Port of Bellingham |
| PQL | Practical Quantiation Limit |
| PSDDA | Puget Sound Dredge Disposal Analysis |
| PSEP | Puget Sound Estuary Program |
| PSS | Preliminary Sediment Screening |
| QAPP | Quality Assurance Project Plan |
| QA/QC | Quality Assurance/Quality Control |
| RI | Remedial Investigation |
| RPD | Relative Percent Difference |
| SAP | Sampling and Analysis Plan |
| SAPA | Sampling and Analysis Plan Addendum |
| SHA | Site Hazard Assessment |
| SITE | R. G. Haley International Company Site |
| SMS | Sediment Management Standards |
| SOPs | Standard Operating Procedures |
| STATE | State of Washington |
| SQS | Sediment Quality Standards |
| SVOCs | Semi-Volatile Organic Compounds |
| TEQ | Toxicity Equivalent |
| TOC | Total Organic Carbon |
| USCG | United States Coast Guard |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compound |
| WAC | Washington Administrative Code |
| WARM | Washington Ranking Method |

# DRAFT DATA QUALITY ASSESSMENT (VOLUME II)
# R.G. HALEY INTERNATIONAL CORPORATION SITE
# BELLINGHAM, WASHINGTON

## FOR
## DOUGLAS MANAGEMENT COMPANY

## 1.0 INTRODUCTION

This document presents the findings of a comprehensive analytical data quality review for the Haley project. This review addresses soil, sediment, product, and groundwater samples collected by GeoEngineers, Inc. for field activities occurring in June and July of 2004. Soil and groundwater samples were submitted to North Creek Analytical, Inc (NCA). in Redmond, Washington for analysis. Dioxin analyses for soils and groundwater were sub-contracted by NCA to Frontier Analytical Laboratory of El Dorado Hills, California. Sediment samples were analyzed by Columbia Analytical Services, Inc. in Kelso, Washington. Samples were analyzed for the following matrices and analytical methods:

**Soil**

- Volatile organics compounds (VOCs) by SW-846 8260B
- Organic carbon by SW-846 9060
- Carcinogenic polynuclear aromatic hydrocarbons (CPAHs) by GC/MS-SIM and SW-846 8270C
- Semi-volatile organic compounds (SVOCs) by SW-846 8270C
- Metals by SW-846 6020 and SW-846 7196A
- Dioxins by SW-846 8290
- Petroleum hydrocarbons by NWTPH-Dx, NWTPH-HCID, and Extractable Petroleum Hydrocarbons (EPH)

**Sediment**

- Grain size, sulfide, and organic carbon by Puget Sound Estuary Program protocols
- Ammonia by EPA 350.3-modified
- Semi-volatile organic compounds (SVOCs) by SW-846 8270C
- Mercury by SW-846 7471A
- Dioxins by SW-846 8290

**Groundwater**

- Volatile organics compounds (VOCs) by SW-846 8260B
- Sulfate by EPA 300.0
- Nitrate by EPA 353.2
- Organic carbon by EPA 415.1 and SW-846 9060
- Petroleum hydrocarbons by NWTPH-Dx and Extractable Petroleum Hydrocarbons (EPH)
- Metals by SW-846 6020 and SW-846 7196A
- Selenium by N2520
- Carcinogenic polynuclear aromatic hydrocarbons (CPAHs) SW-846 8270C
- Semi-volatile organic compounds (SVOCs) by SW-846 8270C
- Dioxins by SW-846 8290

**Product**

- Dioxins by SW-846 8290

The number of samples collected by matrix (including field duplicates) is presented below:

- Soil – 50 samples
- Sediment – 8 samples
- Groundwater – 25 samples
- Product – 1 sample

Details on the precise number and types of analyses, as well as detailed sample information is available within the main body of the of the Remedial Investigation (RI) report. This document focuses primarily on data quality issues. Table 1 provides an index of sample identification, matrix, methods, sample delivery groups, and batch identifiers. The laboratory supplied case narrative is supplied as Attachment A to this document and additional details and clarification to quality control issues identified in this report.

## 1.1 PURPOSE AND OBJECTIVES

The objective of this data quality assessment is to review laboratory analytical procedures and quality control results to verify or refute the usability of data toward meeting project data quality objectives (DQOs) established in the project Work Plan (GeoEngineers, 2004). Data quality objectives were established to specify the quality of data regard to support decisions during remedial response activities. DQOs define the methods to be used in the RI and were developed to ensure the following:

- Applicable or relevant and appropriate requirements (ARARs), risk-based criteria, and data needs for the risk assessment and engineering requirements are met.
- Samples are analyzed using well-defined and acceptable methods that will provide confident detection limits sufficiently below the ARARs that are accurate enough for risk assessment.
- The precision and accuracy of data are well defined and adequate to provide defensible data.
- Samples are collected using approved techniques and are representative of existing environmental conditions.
- QA/QC procedures for both field and laboratory procedures meet acceptable industry practices and standards.

The main quality assurance objective of an investigation is to collect environmental monitoring data of known, acceptable, and documentable quality. An evaluation of quality assurance procedures against established criteria is followed by a quality control evaluation. If quality assurance/quality control (QA/QC) procedures are followed correctly, then an investigation would produce data that are of an acceptable level of confidence, scientifically valid, of known and documented quality, and legally defensible for the stated purpose.

## 1.2 DATA EVALUATION CRITERIA

Data review was performed using guidance from *Upland Remedial Investigation Work Plan Former R.G Haley Wood Treatment and DNR Properties, Bellingham, Washington* by GeoEngineers, Inc. (March of 2004), NCA laboratory control limit criteria, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (USEPA, 2002), and *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 1999). Additional references include *Methods for Chemical Analysis of Water and Wastes* (EPA 1983) and *Test Methods for Evaluating Solid*

*Waste*, SW-846, 3rd Edition (EPA 1986). The review included but was not limited to evaluation of holding times, method blanks, blank spike and matrix spike recoveries, surrogate recoveries (system monitoring compounds), laboratory and field duplicate/replicate data, calibrations, and internal standards. Additionally, a review and comparison between the electronic database and hard copy was performed to verify correctness of reported results.

Data qualification was based on recommended actions in the guidance documents and professional judgement. A conservative approach was taken, favoring false positive or elevated results over false negative or low biased results.

Laboratory hardcopy results and associated worksheets are stored with project files and can be provided upon request. Associated quality assurance worksheets are stored with project files and can be provided upon request. A summary of laboratory data is included in the main body of the RI report.

## 2.0 TECHNICAL ASSESSMENT

Data were evaluated against referenced criteria identified in Section 1.2. Samples received by the laboratory were grouped into sample delivery groups (SDG) and assigned an identification number. Re-qualification of results based on each specific criteria was not performed until the end of this section unless specific qualification was required. Table 2 details samples requiring qualification and reasons for the action. A summary of issues and conclusions appears at the end of this document.

In some instances, QC results were reported outside of Work Plan criteria but within the laboratory's criteria. This discrepancy existed because a laboratory other than NCA was originally intended to perform the work and provided QC criteria during plan development. The plans were finalized and approved, after which NCA was contracted to conduct the work. During this review all exceptions to either the Work Plan or laboratory criteria were noted in tables referenced below. However, it was our professional judgement to ultimately use NCA's criteria, not another laboratory's criteria, to qualify results.

### 2.1 HOLDING TIMES

All samples were submitted with the appropriate preservatives. If a sample exceeds a holding time (extraction and/or analysis) for a specified method, then the results may be biased low. If holding times are grossly exceeded, then results may be qualified as unusable. Samples slightly missing holding can still produce useable data, but may be biased low. Table 3 identifies samples that exceeded holding times. Results for samples that slightly exceeded holding times were qualified as "J" or estimated.

Nine samples, all re-analyses, grossly exceeded holding times for groundwater EPH analysis. The re-analyses were conducted due to poor batch QC during the original analyses. All non-detect results for the re-analyses were rejected ("R" flagged) and detected results were qualified as estimated. Because of the QC issues with the original analyses, some of the detected (and qualified) results from the re-analyses were reported as final results.

### 2.2 METHOD BLANKS

Method blanks are laboratory quality control (QC) samples that consist of either a soil like material having undergone a contaminant destruction process or HPLC water. Method blanks are extracted and analyzed with each batch of environmental samples undergoing analysis. Method blanks are particularly useful during volatile analysis since volatile compounds can be transported in the laboratory through the vapor phase. If a substance is found in the method blank then one (or all) of the following occurred:

- Measurement apparatus or containers were not properly cleaned and contained contaminants.
- Reagents used in the process were contaminated with a substance(s) of interest.
- Analytical equipment were not properly cleaned and contained contaminants.
- Volatile substances in the air with high solubility or affinities toward the sample matrix contaminated the samples during preparation or analysis.

If blank contamination occurs it is difficult to determine which of the scenarios above took place and is assumed that whatever affected the blanks probably affected the samples. Given method blank results, validation rules assist in determining which substances in samples are considered "real" and those detections attributed to the analytical process. Furthermore, guidelines state, " . . . there may be instances where little or no contamination was present in the associated blank, but qualification of the sample is deemed necessary. . .. Contamination introduced through dilution water is one example." In the opinion of the reviewer, no further review was required.

Validation procedures concerning blanks were followed according to guidelines provided in documents referenced in Section 1. The guidelines state, "Positive results [detections in samples] should be reported unless the concentration of the compound in the sample is less than or equal to 10 times (10x) the amount in any [associated] blank for the common laboratory contaminants . . . or 5 times (5x) the amount for other target compounds." Method blanks were reviewed first against all samples, including trip blanks. Then trip blanks were reviewed against samples.

Method blank detections are presented in Table 4. These detections did not adversely affect sample results nor did they indicate any kind of pervasive laboratory quality control issues. No results were qualified as a result of blank contamination.

## 2.3 PRECISION AND ACCURACY

Data quality is also assessed by precision and accuracy that measure the reproducibility of analytical results and the consistency in the performance of the analytical methods. Precision is the measure of mutual agreement among replicate or duplicate measurements of the same analyte. The closer the numerical values of the measurements are to each other, the more precise the measurement. This allows immediate comparison of the precision of different results under the same method. Matrix spike/matrix spike duplicate (MS/MSD) and duplicate analyses assist in measuring precision of a compound being analyzed. Precision for a single analyte is expressed as a relative percent difference (RPD) between results of matrix spikes and matrix spike duplicates where:

$$RPD = \frac{(D1 - D2)}{(D1xD2)/2} X\ 100$$

$$D1 = Sample\ \ Result$$

$$D2 = Duplicate\ \ Sample\ \ Result$$

Accuracy is a measure of bias in the analyses process. The closer the value of the measurement agrees with the true value, the more accurate the measurement. Accuracy is expressed as the percent recovery of an analyte from a surrogate or matrix spike sample or from a standard reference material where:

$$Surrogate\ Percent\ Recovery = \frac{(Sample\ Result)}{(Spike\ Amount)}\ X\ 100$$

$$Spike\ Percent\ Recovery = \frac{(Spike\ Result - Sample\ Result)}{(Spike\ Amount)}\ X\ 100$$

When accuracy and precision goals are not achieved, the sample(s) in question should be re-analyzed, if feasible. If the problem is due to matrix interferences with a particular sample or group of samples, this information should be noted in the report of results. The analysis of MS/MSDs determine if matrix interference problems are present. The recovery of surrogate compounds from environmental samples and the results of standard additions in environmental samples also verify the presence of matrix interferences.

### *2.3.1 Surrogate Recoveries*

Surrogate analytes are also known as system monitoring compounds. The purpose of using a surrogate is to verify the accuracy of the instrument being used. Surrogates of known concentration are added to the sample and passed through the instrument, noting the amount recovered. Each surrogate used has an acceptable range of percent recovery. If a surrogate recovery is low, sample results may be biased low and depending on the recovery value, a possibility of false negatives may exist. Conversely, when recoveries are above the specified range of acceptance a possibility of false positives exist, although non-detected results are considered accurate. Surrogates are only evaluated on organic analyses. Table 5 identifies those surrogates outside of accepted criteria and actions taken. The bulk of surrogate issues were limited to the SVOCs analysis of soils.

**Volatile organics by SW-846 8260B** – Three surrogates per sample were used to monitor this method. No surrogate recoveries were outside QC limits

**CPAHs by GC/MS-SIM** – Three surrogates per sample were used to monitor this method. No recoveries were outside QC limits.

**Semivolatile organics by SW-846 8270C** – Six surrogates per sample were used to monitor this method. In several instances one or more of the acid fraction surrogates were low, indicating potential system wide problems. After discussing the matter with NCA, the laboratory confirmed that they had noticed system wide problems with the acid fraction QC and results. This factor was taken into consideration when qualifying results. The acid fraction analytes include all of the phenolics, specifically pentachlorophenol, 2,3,4,5-tetrachlorophenol, 2,3,5,6-tetrachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol. See Table 2 for details regarding specific qualifications.

**Petroleum hydrocarbons by NWTPH-Dx and EPH –** Two surrogates each are used when quantifying diesel and EPH. Exceptions were noted on three samples for EPH analysis and qualification was performed. See Table 2 for details regarding specific qualifications.

**Dioxins/Furans by SW-846 8290** – There were 17 surrogates per sample used to monitor this method. Only one surrogate was above QC criteria, requiring no further action.

### *2.3.2 Matrix Spikes/Matrix Spike Duplicates*

Matrix spikes and matrix spike duplicates (MS/MSDs) are used to evaluate accuracy by determining if matrix conditions, rather than instrument error, influences results. MS/MSDs are also used in evaluating precision. Table 6 details matrix spikes and spike duplicate recoveries that were reported outside QC criteria. Qualification was limited to sample HS-MW-15A-8-10 for SW-846 8270 and CL-MW-7-062404 for EPA 353.2. The remainder of results were not qualified due to one of the following explanations:

- No action taken on MS/MSD recoveries when sample amounts are significantly greater than spike amount. EPA guidelines suggest that when the sample result is four times or greater than the spike amount, the recovery cannot be accurately quantified.
- No action taken because the percent recovery was outside project QC criteria but within laboratory control limits.
- No action taken when the source sample is not from the project site. In several instances a non-Haley related sample was used for batch control and was not considered representative of the site. In these instances no MS/MSD evaluation could be made. This does not indicate a lower level of quality, rather, it introduces a small amount of uncertainty.

Furthermore, no action is required when spike recoveries are elevated. One item in particular to note was the extremely low recoveries for hexavalent chromium. After several re-analyses the laboratory measured the redox potential and determined that the matrix was in a reduced environment, thus any hexavalent chromium exposed to this media would automatically be converted to a lower charged ion of chromium (chromium 3 or 4).

### *2.3.3 Laboratory Control Spikes/Blank Spikes*

Laboratory/blank spikes are performed to check system performance and overall quality of analytical procedures. These are samples originating from a contaminant free source (e.g. HPLC water) and spiked with target compounds to evaluate recoveries. Exceptions were noted and detailed in Table 7. Generally speaking, blank spike exceptions are uncommon. The primary reason for the exceptions in Table 7 was due to the difference in the Work Plan QC criteria and the laboratory criteria.

The EPH analysis for batch 4F25014 experienced particularly low recoveries, indicating a batch QC problem for C10-C12 Aliphatics, C8-C10 Aliphatics, and C12-C16 Aliphatics. Sample results for these analytes were qualified as unusable ("R" flagged). As per the method, subsequent re-analyses were performed. Unfortunately, the extractions for the re-analyses took place long after the acceptable holding time (see Section 2.1). Detected results from the re-analyses were considered useable but biased low.

### *2.3.4 Laboratory Replicates*

Matrix spike duplicates, laboratory control spike duplicates, and laboratory replicate samples are used to assess overall precision. Precision is the measure of mutual agreement among replicate or duplicate measurements of a given analyte. The closer the values of the measurements are to each other, the more precise the measurement. Precision is expressed by the relative percent difference (RPD). Typically, sample results are not qualified based on precision goals alone but rather are evaluated in conjunction with other QC criteria. RPD values above QC criteria are detailed in Table 8. Data are not qualified on RPD exceedances alone, rather, this information is taken into consideration with other QC results. In general, duplicate results indicated good consistency in laboratory processes.

## 2.4 CALIBRATIONS

Satisfactory calibrations ensure that the instrument is capable of producing acceptable qualitative and quantitative data. Initial calibrations demonstrate that the instrument is performing correctly at the beginning of a run. Continuing calibrations verify system performance throughout the remainder of the run. Tables 9 through 11 identify areas where QC limits were noted. Actions taken based on calibrations appear in Table 2.

### 2.5 INTERNAL STANDARDS

Internal standards ensure that instruments are maintaining the correct sensitivity and the response is stable for each analytical run. Table 12 identifies those standards outside QC limits.

## 3.0 FIELD QA/QC SAMPLES

### 3.1 FIELD DUPLICATE SAMPLES

Field duplicate samples are used to assess overall precision. One groundwater field duplicate sample was collected. Sample HS-D-062304 was a field duplicate of HS-MW-13-062304. RPD is one method used for determining variability. Based on an RPD analysis, the petroleum results were very consistent with RPDs less than 20 percent. The RPD values for SVOCs ranged from 16 to 200 percent. This would indicate variability within the analytical process, which contradicts the earlier statement of good reproducibility. Laboratory analysts suggested the variability may be due to some heterogeneity within the samples themselves. In some samples they noted small oily globules clinging to the sides of the glass. This could cause variability, especially with results near detection limits.

### 3.2 EQUIPMENT RINSATES

Equipment rinsate samples indicate possible cross-contamination from sampling equipment or sample containers. One rinsate was collected during soil sampling. The sample RINSATE 062104 was collected after exploration TL-DP-1 and before exploration TL-DP-2. Trace amounts of SVOCs were detected in the rinsate. Although no sample was submitted for TL-DP-1, field notes indicated visual confirmation of heavy contamination including heavy sheen, heavy odor, and the soil appeared to be saturated with oil. The presence of substances in the rinsate indicates that decontamination procedures were able to remove the bulk of contaminants from equipment but in cases of heavy contamination, the possibility for cross-contamination from one sample to the next existed. Samples with trace results taken after samples with relatively high detections may be biased high.

## 4.0 LIMITATIONS

Limitations are conditions that interfere or limit analytical performance qualitatively or quantitatively. Every analytical method has quantitative limitations at a given statistical level of confidence that are often expressed as method detection limits. Individual instruments often can detect but not accurately quantify compounds at lower concentrations. This is expressed as the instrument detection limit. Under ideal conditions these limits can be achieved, but certain factors affect an instrument's ability to reach these limits. This section describes important limitations and the affects on this project.

### 4.1 SAMPLE INTEGRITY

Sample integrity refers to the sample temperature, sample preservation, and physical condition of the sample container upon arrival at the laboratory. Sample log-in sheets and cooler receipt forms from the laboratory record sample integrity.

The laboratory required samples to be preserved within specific pH ranges for selected analyses. All samples preserved with acids were labeled, indicating the type of preservative used and pH of the sample. The sample log-in sheets were reviewed to insure preservation requirements were met. All samples were preserved properly.

Regulating sample temperature is an important part of the sample collection and analysis process, especially for organic compounds. Heat causes volatilization of many organic compounds and may

increase degradation of a compound's structure. Heat can also increase the solubility of metals and chemical activity. For these reasons standard sample protocol (EPA 1983; 1986) call for samples to be cooled to 4 degrees Celsius after sampling and during transport to the laboratory. The laboratory case narratives indicate all coolers were received with acceptable temperatures except for soil samples associated with SDG B4F0746. These samples arrived at 6.1 degrees celcius, 0.1 degree above the recommended range. This batch of samples were delivered quickly from the time of collection and may not have had time to cool down and equilibrate.

If a sample container is cracked or broken, the possibility of cross contamination from other samples exists. A review of laboratory cooler receipt forms indicated no sample containers were cracked or broken. Several discrepancies were noted between the chain-of-custodies and what was received (e.g. too many containers, not enough containers, no sample time noted), however, all issues were resolved quickly with the laboratory. All chain of custody forms were signed and dated. With two exceptions, all samples requiring field preservation were preserved properly. The exceptions were for samples, TL-MW-10-062304 and HS-MW-9-062304. These samples arrived with a pH above 2. Samples were extracted and analyzed within unpreserved holding times and thus would have no impact.

The laboratory did add HCL but noted little change in pH. The laboratory continued to add HCL until the proper pH was attained. The laboratory noted more HCL than usual was required to attain proper pH, indicating the groundwater probably had high buffer capacity.

## 4.2 MATRIX INTERFERENCES

Matrix interferences are conditions unique to a sample or sample matrix that hinder the analysis process and may increase the error in quantifying an analyte. Interferences may include a high clay fractions, extreme pH, or the overwhelming presence of a contaminant.

### *4.2.1 Extreme pH*

The pH of a sample can affect analytical processes and cause biased results. The effect of pH varies between analytical methods and sample matrix. There were no known instances of extreme pH. Table 13 contains a summary of groundwater sampling parameters including temperature, conductivity, pH, and turbidity.

### *4.2.2 Turbidity*

Turbidity is an indirect means of measuring solids suspended in solution. Turbidity is measured by the amount of light transmitted through a liquid sample and is expressed in nephelometric turbidity units (NTU). Turbidity is inversely related to light transmission, the less light transmitted, the higher the turbidity. Since some compounds tend to adsorb to sediments and suspended media, results for turbid water samples can be biased high. In addition, total metals samples are not filtered and since metals samples are preserved at a pH < 2, many inorganic salts and materials tend to dissolve into solution. Therefore, any inorganic solids in a groundwater sample requiring acidified preservation can bias metals results higher than actual concentrations. However, non-detect results are not affected. For this review, the analytical methods affected by increased turbidity were for metals; SW-846 6020 and SW-846 7196A. There is no generally accepted value at which pH affects sample results, however, the samples with a turbidity over the drinking water standard maximum of 5.0 NTU can be considered potentially biased high.

### *4.2.3 Compound Interference*

Determination of compound concentrations using a GC/MS can be influenced by interference from other compounds or the chemistry of the matrix. Interference may be caused by high concentrations that "mask" similar compounds, creating difficulties in distinguishing and quantifying, between compounds.

Hexavalent chromium analyses in sediment were impacted by the reducing environment of the samples, although the impact was considered minimal since hexavalent chromium does not persist in such conditions in the environment. Several other analyses indicated possible matrix interference with no specific cause. In particular the well MW-01 (also referred to as HS-MW-1) had several different analyses experience matrix problems. Results from MW-01 are considered useable but should not be solely relied upon for decision-making.

Several diesel detections were suspect either because their chromatographic pattern did not match a typical Diesel No. 2 pattern or there was overlap from heavy oil range products. Both instances would heavily bias high the diesel results. Data users are cautioned against making critical decisions against the following diesel results:

- HS-HA-5-0-1
- HS-HA-4-0-1
- HS-HA-3-0-1
- TL-HA-2-0-1
- HS-DP-9-8-9
- TL-MW-11-17-18

Similarly, the results for samples HS-HA-4-0-1 and TL-HA-2-0-1 indicate the presence of diesel based on carbon ranges, however the chromatogram does not match a typical diesel No. 2 pattern.

### *4.2.4 Dilutions*

Samples with analyte concentrations greater than a method's upper quantitation limits require instrument adjustment or dilutions to obtain proper results. Dilutions affect samples in many ways. Use of diluting solvents or additional measuring equipment reduces accuracy by increasing measurement error. Unless laboratory contamination is identified when diluting, contaminant compounds may be reported at artificially high concentrations. Dilution also effectively raises the detection limit for all compounds of interest, including those not requiring dilutions. For example, a dilution factor of 100 would raise the detection limit for an analyte from 10 parts per billion (ppb) to 1000 ppb. Spike compounds used for QC control can also be diluted below detection limits. Samples can be diluted by any of the following procedures:

- Use of smaller sample aliquots for analysis.
- Use of greater amounts of solvent for analyte extraction.
- Dilution of the extracted sample.
- Use of a medium level analysis versus low level analysis (the procedure for medium level analysis implies dilution).

Dilutions were required for several analyses and impacts appear to be limited to spike recoveries and elevated detection limits. It was not uncommon for surrogate spikes to be diluted beyond their detection range and thus could not be properly evaluated. Several references to dilutions are found throughout the

case narrative. Dilutions due not indicate lower the quality of data, rather, the confidence of the quality is slightly less than would be otherwise.

## 5.0 SUMMARY AND CONCLUSIONS

Overall, the analytical data generated by GeoEngineers, Inc. during the investigation of the Former R.G Haley Wood Treatment site is useable for defining the nature and extent of contamination, conducting human health and ecological risk assessments, and conducting a feasibility study, and other data needs for decision making processes. When applicable, analytical results were compared against criteria for holding times, method blanks, and precision and accuracy, calibrations, and internal standards.

In several cases QC results exceeding criteria were reviewed after comparison to other QC criteria. The biggest issues revolved around EPH, SVOC, and CPAH analyses. Several EPH analytes experienced QC issues and thus many of the EPH samples were reanalyzed. However, these analyses occurred past holding times, creating a low bias. Non-detect results for EPH re-analyses were rejected while detected results are estimated. Ultimately, the valid results from the original EPH analyses were used in conjunction with the valid results of the re-analyses to create a complete set of results.

Several issues were also noted with the SVOC and CPAH analyses, however, due to the overlap in the target compounds list (e.g. chrysene, phenanthrene, etc.) a complete set of final results were readily obtained. In the case were no QC issues existed, the larger value between the two sets of results were used. For example, if a sample had two chrysene results (one from the SVOC analysis and one from the GC/MS-SIM analysis) the larger of two detected results were reported. Similarly, if one result was reported as a non-detect and the other detect, the detected result was considered as the reported result.

The approach used in this assessment tended to be conservative, including eliminating data when uncertainty of results was unacceptably high. Also, detected compounds are more likely to experience a Type I error over a Type II error. A Type I error occurs when the false positive results are selected over false negatives; a Type II error is the reverse. A Type I error would also tend to bias detected result upward.

This data evaluation was performed by GeoEngineers, Inc. using best professional judgement. Data users may review and re-interpret data quality for specific uses.

### 5.1 SIGNIFICANT QUALIFICATION

Significant qualification refers to result changes that can significantly impact data uses or interpretations. These impacts include detected results qualified as undetected or rejected results. Significant qualification did occur resulting in rejected results.

### 5.2 MINOR QUALIFICATION

Minor qualifications usually resulted in data qualified as estimated (J). These qualifications reflect exceedance of specific QC criteria or a combination of QC criteria. Although results are useable, some bias may be present.

# TABLE 1
# SAMPLE ANALYSIS SUMMARY INFORMATION
## FORMER HALEY WOOD TREATING SITE/DNR PROPERTY

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Product | UST-061504 | 6/15/04 | B4F0621-55 | B4F0621 | SW8290 | 7/15/04 | 0:00 | X298 | 1 |
| Sediment | RI-1-0-0.33 | 7/29/04 | K2405633-001 | K2405633 | PLUMB | 8/4/04 | 13:50 | KA0403920 | 1 |
| Sediment | RI-1-0-0.33 | 7/29/04 | K2405633-001 | K2405633 | PSEP | 8/2/04 | 16:00 | KA0403446 | 1 |
| Sediment | RI-1-0-0.33 | 7/29/04 | K2405633-001TRP | K2405633 | PSEP | 8/4/04 | 12:00 | KA0403446 | 100 |
| Sediment | RI-1-0-0.33 | 7/29/04 | K2405633-001 | K2405633 | SW7471 | 8/10/04 | 10:30 | KP0400654 | 2 |
| Sediment | RI-1-0-0.33 | 7/29/04 | E2400712-001 | K2405633 | SW8290 | 8/13/04 | 18:06 | EB18073 | 1 |
| Sediment | RI-1-0-0.33 | 7/29/04 | E2400712-001DL | K2405633 | SW8290 | 8/16/04 | 16:51 | EB18073 | 20 |
| Sediment | RI-2-0-0.33 | 7/29/04 | K2405633-002 | K2405633 | PLUMB | 8/4/04 | 13:50 | KA0403920 | 1 |
| Sediment | RI-2-0-0.33 | 7/29/04 | K2405633-002 | K2405633 | PSEP | 8/4/04 | 12:00 | KA0403446 | 2 |
| Sediment | RI-2-0-0.33 | 7/29/04 | K2405633-002 | K2405633 | PSEP | 8/2/04 | 16:00 | K2405633 | 1 |
| Sediment | RI-3-0-0.33 | 7/29/04 | K2405633-003 | K2405633 | PLUMB | 8/4/04 | 13:50 | KA0403920 | 1 |
| Sediment | RI-3-0-0.33 | 7/29/04 | K2405633-003 | K2405633 | PSEP | 8/4/04 | 12:00 | KA0403446 | 100 |
| Sediment | RI-3-0-0.33 | 7/29/04 | K2405633-003 | K2405633 | PSEP | 8/2/04 | 0:00 | K2405633 | 1 |
| Sediment | RI-4-0-0.33 | 7/29/04 | K2405633-006 | K2405633 | PLUMB | 8/4/04 | 13:50 | KA0403920 | 1 |
| Sediment | RI-4-0-0.33 | 7/29/04 | K2405633-006 | K2405633 | PSEP | 8/4/04 | 12:00 | KA0403446 | 500 |
| Sediment | RI-4-0-0.33 | 7/29/04 | K2405633-006 | K2405633 | PSEP | 8/2/04 | 0:00 | K2405633 | 1 |
| Sediment | RI-4-0-0.33 | 7/29/04 | K2405633-006 | K2405633 | SW7471 | 8/10/04 | 10:09 | KP0400654 | 1 |
| Sediment | RI-4-0-0.33 | 7/29/04 | E2400712-002DL | K2405633 | SW8290 | 8/16/04 | 17:42 | EB18073 | 20 |
| Sediment | RI-4-0-0.33 | 7/29/04 | E2400712-002 | K2405633 | SW8290 | 8/13/04 | 18:57 | EB18073 | 1 |
| Sediment | RI-5-0-0.33 | 7/30/04 | K2405633-007 | K2405633 | PLUMB | 8/4/04 | 13:50 | KA0403920 | 1 |
| Sediment | RI-5-0-0.33 | 7/30/04 | K2405633-007 | K2405633 | PSEP | 8/4/04 | 12:00 | KA0403446 | 500 |
| Sediment | RI-5-0-0.33 | 7/30/04 | K2405633-007 | K2405633 | PSEP | 8/2/04 | 16:00 | K2405633 | 1 |
| Sediment | RI-5-0-0.33 | 7/30/04 | K2405633-007 | K2405633 | SW7471 | 8/10/04 | 10:10 | KP0400654 | 1 |
| Sediment | RI-5-0-0.33 | 7/30/04 | E2400712-003 | K2405633 | SW8290 | 8/13/04 | 19:47 | EB18073 | 1 |
| Sediment | RI-5-0-0.33 | 7/30/04 | E2400712-003DL | K2405633 | SW8290 | 8/16/04 | 18:32 | EB18073 | 20 |
| Sediment | RI-6-3.5-4.5 | 7/30/04 | K2405633-008 | K2405633 | PSEP | 8/13/04 | 14:00 | KA0403659 | 1 |
| Sediment | RI-6-3.5-4.5 | 7/30/04 | K2405633-008 | K2405633 | SW8270 | 8/13/04 | 22:58 | KWG0411384 | 5 |
| Sediment | RI-6-3.5-4.5 | 7/30/04 | K2405633-008 | K2405633 | SW8270 | 8/16/04 | 20:01 | KWG0411384 | 10 |
| Sediment | RI-7-3-4 | 7/29/04 | K2405633-004 | K2405633 | PSEP | 8/13/04 | 14:00 | KA0403659 | 1 |
| Sediment | RI-7-3-4 | 7/29/04 | K2405633-004 | K2405633 | SW8270 | 8/13/04 | 20:20 | KWG0411384 | 5 |
| Sediment | RI-8-4.5-5.5 | 7/29/04 | K2405633-005 | K2405633 | PSEP | 8/13/04 | 14:00 | KA0403659 | 1 |
| Sediment | RI-8-4.5-5.5 | 7/29/04 | K2405633-005 | K2405633 | SW8270 | 8/13/04 | 22:18 | KWG0411384 | 5 |
| Sediment | RI-8-4.5-5.5 | 7/29/04 | K2405633-005 | K2405633 | SW8270 | 8/16/04 | 19:21 | KWG0411384 | 10 |
| Soil | CL-MW-1D-12-13 | 6/17/04 | B4F0627-34 | B4F0627 | NWTPH-DxSG | 6/29/04 | 22:21 | 4F28032 | 10 |
| Soil | CL-MW-1D-12-13 | 6/17/04 | B4F0627-34 | B4F0627 | NWTPH-DxSG | 6/30/04 | 14:09 | 4F28032 | 10 |
| Soil | CL-MW-1D-12-13 | 6/17/04 | B4F0627-34 | B4F0627 | Solids, Dry Weight | 6/30/04 | 9:30 | 4F29011 | 1 |
| Soil | CL-MW-1D-8-10 | 6/17/04 | B4F0627-32 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | CL-MW-1D-8-10 | 6/17/04 | B4F0627-32 | B4F0627 | SW8270 | 6/30/04 | 1:09 | 4F28028 | 100 |
| Soil | CL-MW-1D-8-10 | 6/17/04 | B4F0627-32 | B4F0627 | SW8270 | 6/30/04 | 2:37 | 4F28028 | 10 |
| Soil | CL-MW-1D-8-10 | 6/17/04 | B4F0627-32 | B4F0627 | SW8270 | 6/29/04 | 20:44 | 4F28028 | 1 |
| Soil | HS-DP-10-7-8 | 6/21/04 | B4F0746-44 | B4F0746 | NWTPH-DxSG | 6/28/04 | 9:58 | 4F25034 | 2 |
| Soil | HS-DP-10-7-8 | 6/21/04 | B4F0746-44 | B4F0746 | Solids, Dry Weight | 6/26/04 | 12:20 | 4F25024 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | NWTPH-DxSG | 6/24/04 | 14:03 | 4F22042 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | SW6020 | 6/22/04 | 17:03 | 4F22015 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | SW8270 | 6/25/04 | 17:22 | 4F22048 | 1 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | SW8270 | 6/29/04 | 22:11 | 4F22048 | 100 |
| Soil | HS-DP-1-12-14 | 6/15/04 | B4F0621-07 | B4F0621 | SW8270 | 6/30/04 | 15:31 | 4F22048 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | GC/MS SIM PAH | 7/12/04 | 18:21 | 4F30040 | 1 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | NWTPH-DxSG | 6/24/04 | 1:13 | 4F22037 | 1 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | SW8270 | 7/6/04 | 22:27 | 4F30040 | 1 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | SW8270 | 7/7/04 | 0:25 | 4F30040 | 1 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | SW8270 | 7/7/04 | 10:11 | 4F30040 | 10 |
| Soil | HS-DP-12-8-9 | 6/16/04 | B4F0626-45 | B4F0626 | SW8290 | 7/17/04 | 0:00 | X299 | 1 |
| Soil | HS-DP-13-8-9 | 6/16/04 | B4F0626-35 | B4F0626 | NWTPH-HCID | 6/23/04 | 9:16 | 4F22056 | 1 |
| Soil | HS-DP-13-8-9 | 6/16/04 | B4F0626-35 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | HS-DP-1-4-6 | 6/15/04 | B4F0621-03 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-1-4-6 | 6/15/04 | B4F0621-03 | B4F0621 | SW6020 | 6/22/04 | 16:12 | 4F22015 | 1 |
| Soil | HS-DP-1-4-6 | 6/15/04 | B4F0621-03 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-14A-4-8 | 6/18/04 | B4F0701-09 | B4F0701 | Solids, Dry Weight | 6/26/04 | 12:20 | 4F25024 | 1 |
| Soil | HS-DP-14A-4-8 | 6/18/04 | B4F0701-09 | B4F0701 | SW8260B | 6/26/04 | 4:56 | 4F25046 | 1 |
| Soil | HS-DP-15-4.5-8.5 | 6/21/04 | B4F0746-38 | B4F0746 | NWTPH-HCID | 6/25/04 | 19:24 | 4F25036 | 1 |
| Soil | HS-DP-15-4.5-8.5 | 6/21/04 | B4F0746-38 | B4F0746 | Solids, Dry Weight | 6/26/04 | 12:20 | 4F25024 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | NWTPH-DxSG | 6/24/04 | 13:40 | 4F22042 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | NWTPH-DxSG | 6/24/04 | 19:08 | 4F22042 | 20 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW6020 | 6/23/04 | 10:21 | 4F22015 | 5 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW6020 | 6/22/04 | 16:52 | 4F22015 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW8270 | 6/25/04 | 16:53 | 4F22048 | 1 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW8270 | 6/29/04 | 21:41 | 4F22048 | 100 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW8270 | 6/30/04 | 1:00 | 4F22048 | 10 |
| Soil | HS-DP-1-8-10 | 6/15/04 | B4F0621-05 | B4F0621 | SW8270 | 7/1/04 | 12:25 | 4F22048 | 1 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | NWTPH-DxSG | 6/24/04 | 14:26 | 4F22042 | 1 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | NWTPH-DxSG | 6/24/04 | 19:31 | 4F22042 | 10 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | SW8270 | 6/25/04 | 18:20 | 4F22048 | 1 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | SW8270 | 6/29/04 | 23:10 | 4F22048 | 100 |
| Soil | HS-DP-4-12-14 | 6/15/04 | B4F0621-17 | B4F0621 | SW8270 | 6/30/04 | 16:26 | 4F22048 | 1 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | EPH | 7/10/04 | 0:38 | [CALC] | 10 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | EPH | 7/10/04 | 0:38 | 4F28030 | 5 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | NWTPH-DxSG | 6/24/04 | 14:03 | 4F22042 | 1 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | NWTPH-DxSG | 6/24/04 | 19:31 | 4F22042 | 20 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | SW8270 | 7/1/04 | 12:52 | 4F22048 | 1 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | SW8270 | 6/25/04 | 17:51 | 4F22048 | 1 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | SW8270 | 6/29/04 | 22:41 | 4F22048 | 100 |
| Soil | HS-DP-4-8-11 | 6/15/04 | B4F0621-15 | B4F0621 | SW8270 | 6/30/04 | 1:28 | 4F22048 | 10 |
| Soil | HS-DP-5B-0-2 | 6/15/04 | B4F0621-26 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-5B-0-2 | 6/15/04 | B4F0621-26 | B4F0621 | SW6020 | 6/22/04 | 17:15 | 4F22015 | 1 |
| Soil | HS-DP-5B-0-2 | 6/15/04 | B4F0621-26 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-5B-12-16 | 6/15/04 | B4F0621-32 | B4F0621 | NWTPH-DxSG | 6/24/04 | 16:20 | 4F22042 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | HS-DP-5B-12-16 | 6/15/04 | B4F0621-32 | B4F0621 | NWTPH-DxSG | 6/24/04 | 21:26 | 4F22042 | 5 |
| Soil | HS-DP-5B-12-16 | 6/15/04 | B4F0621-32 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-5B-12-16 | 6/15/04 | B4F0621-32 | B4F0621 | SW6020 | 6/22/04 | 17:49 | 4F22015 | 1 |
| Soil | HS-DP-5B-12-16 | 6/15/04 | B4F0621-32 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | GC/MS SIM PAH | 7/3/04 | 21:36 | 4F22048 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | NWTPH-DxSG | 6/24/04 | 16:20 | 4F22042 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | SW8270 | 6/30/04 | 16:53 | 4F22048 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | SW8270 | 6/25/04 | 19:18 | 4F22048 | 1 |
| Soil | HS-DP-5B-16-19 | 6/15/04 | B4F0621-33 | B4F0621 | SW8270 | 6/30/04 | 0:10 | 4F22048 | 100 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | NWTPH-DxSG | 6/24/04 | 15:57 | 4F22042 | 1 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | NWTPH-DxSG | 6/24/04 | 19:54 | 4F22042 | 40 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW6020 | 6/22/04 | 17:37 | 4F22015 | 1 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW7196 | 6/23/04 | 15:00 | 4F23014 | 1 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW8270 | 6/29/04 | 23:40 | 4F22048 | 100 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW8270 | 6/30/04 | 1:54 | 4F22048 | 10 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW8270 | 7/1/04 | 13:19 | 4F22048 | 1 |
| Soil | HS-DP-5B-8-10 | 6/15/04 | B4F0621-30 | B4F0621 | SW8270 | 6/25/04 | 18:49 | 4F22048 | 1 |
| Soil | HS-DP-6-8-10 | 6/15/04 | B4F0621-38 | B4F0621 | NWTPH-DxSG | 6/24/04 | 21:49 | 4F22042 | 5 |
| Soil | HS-DP-6-8-10 | 6/15/04 | B4F0621-38 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-6-8-10 | 6/15/04 | B4F0621-38 | B4F0621 | SW8260B | 6/30/04 | 23:07 | 4F30034 | 1 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | EPH | 7/9/04 | 16:28 | 4F28030 | 4 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | EPH | 7/12/04 | 16:50 | [CALC] | 8 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | EPH | 7/12/04 | 16:50 | 4F28030 | 8 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | NWTPH-DxSG | 6/24/04 | 16:43 | 4F22042 | 1 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | NWTPH-DxSG | 6/24/04 | 21:49 | 4F22042 | 20 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | SW8270 | 6/30/04 | 4:09 | 4F22048 | 10 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | SW8270 | 6/30/04 | 4:36 | 4F22048 | 1 |
| Soil | HS-DP-8-8-11 | 6/15/04 | B4F0621-47 | B4F0621 | SW8270 | 6/30/04 | 0:40 | 4F22048 | 100 |
| Soil | HS-DP-9-8-9 | 6/15/04 | B4F0621-53 | B4F0621 | GC/MS SIM PAH | 7/3/04 | 22:07 | 4F22048 | 1 |
| Soil | HS-DP-9-8-9 | 6/15/04 | B4F0621-53 | B4F0621 | NWTPH-DxSG | 6/24/04 | 17:06 | 4F22042 | 1 |
| Soil | HS-DP-9-8-9 | 6/15/04 | B4F0621-53 | B4F0621 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-DP-9-8-9 | 6/15/04 | B4F0621-53 | B4F0621 | SW8270 | 6/30/04 | 17:20 | 4F22048 | 1 |
| Soil | HS-DP-9-8-9 | 6/15/04 | B4F0621-53 | B4F0621 | SW8270 | 7/3/04 | 22:07 | 4F22048 | 1 |
| Soil | HS-HA-1-0-1 | 6/14/04 | B4F0617-05 | B4F0617 | NWTPH-DxSG | 6/24/04 | 12:31 | 4F22042 | 1 |
| Soil | HS-HA-1-0-1 | 6/14/04 | B4F0617-05 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-HA-2-0-1 | 6/14/04 | B4F0617-04 | B4F0617 | NWTPH-DxSG | 6/24/04 | 12:07 | 4F22042 | 1 |
| Soil | HS-HA-2-0-1 | 6/14/04 | B4F0617-04 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-HA-3-0-1 | 6/14/04 | B4F0617-03 | B4F0617 | NWTPH-DxSG | 6/24/04 | 11:44 | 4F22042 | 1 |
| Soil | HS-HA-3-0-1 | 6/14/04 | B4F0617-03 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | GC/MS SIM PAH | 7/3/04 | 20:33 | 4F22048 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | NWTPH-DxSG | 6/24/04 | 11:21 | 4F22042 | 1 |
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | Solids, Dry Weight | 6/23/04 | 10:10 | 4F22045 | 1 |
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | SW8270 | 6/25/04 | 13:32 | 4F22048 | 1 |
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | SW8270 | 6/30/04 | 12:48 | 4F22048 | 1 |
| Soil | HS-HA-4-0-1 | 6/14/04 | B4F0617-02 | B4F0617 | SW8270 | 7/3/04 | 20:33 | 4F22048 | 1 |
| Soil | HS-HA-5-0-1 | 6/14/04 | B4F0617-01 | B4F0617 | NWTPH-DxSG | 6/24/04 | 10:57 | 4F22042 | 1 |
| Soil | HS-HA-5-0-1 | 6/14/04 | B4F0617-01 | B4F0617 | Solids, Dry Weight | 6/23/04 | 10:10 | 4F22045 | 1 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | EPH | 7/9/04 | 19:52 | [CALC] | 20 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | EPH | 7/9/04 | 19:52 | 4F28030 | 20 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | GC/MS SIM PAH | 6/23/04 | 21:26 | 4F22047 | 5 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | NWTPH-DxSG | 6/29/04 | 20:38 | 4F28032 | 5 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | NWTPH-DxSG | 6/30/04 | 12:37 | 4F28032 | 20 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | NWTPH-HCID | 6/25/04 | 18:54 | 4F25036 | 1 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | SW8260B | 6/30/04 | 20:47 | 4F30034 | 1 |
| Soil | HS-MW-10-12-13 | 6/16/04 | B4F0626-07 | B4F0626 | SW8270 | 6/30/04 | 2:21 | 4F22047 | 5 |
| Soil | HS-MW-11DA-12-16 | 6/16/04 | B4F0626-15 | B4F0626 | GC/MS SIM PAH | 7/3/04 | 22:38 | 4F22047 | 1 |
| Soil | HS-MW-11DA-12-16 | 6/16/04 | B4F0626-15 | B4F0626 | NWTPH-DxSG | 6/24/04 | 0:10 | 4F22037 | 1 |
| Soil | HS-MW-11DA-12-16 | 6/16/04 | B4F0626-15 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | HS-MW-11DA-12-16 | 6/16/04 | B4F0626-15 | B4F0626 | SW8270 | 6/30/04 | 0:06 | 4F22047 | 1 |
| Soil | HS-MW-11DA-12-16 | 6/16/04 | B4F0626-15 | B4F0626 | SW8270 | 7/3/04 | 22:38 | 4F22047 | 1 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | NWTPH-DxSG | 6/23/04 | 23:06 | 4F22037 | 5 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | SW8270 | 6/30/04 | 16:48 | 4F22047 | 10 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | SW8270 | 6/30/04 | 17:48 | 4F22047 | 1 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | SW8270 | 6/30/04 | 18:18 | 4F22047 | 50 |
| Soil | HS-MW-11DA-4-8 | 6/16/04 | B4F0626-13 | B4F0626 | SW8270 | 6/26/04 | 6:07 | 4F22047 | 1 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | NWTPH-DxSG | 6/23/04 | 23:39 | 4F22037 | 1 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | NWTPH-DxSG | 6/24/04 | 12:13 | 4F22037 | 2 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | SW8270 | 6/30/04 | 18:42 | 4F22047 | 1 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | SW8270 | 6/26/04 | 6:33 | 4F22047 | 1 |
| Soil | HS-MW-11DA-8-12 | 6/16/04 | B4F0626-14 | B4F0626 | SW8270 | 6/30/04 | 17:18 | 4F22047 | 10 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | EPH | 7/12/04 | 18:53 | 4F28030 | 2 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | EPH | 7/9/04 | 20:33 | 4F28030 | 1 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | EPH | 7/12/04 | 18:53 | [CALC] | 2 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | GC/MS SIM PAH | 6/23/04 | 20:24 | 4F22047 | 1 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | NWTPH-DxSG | 6/24/04 | 0:42 | 4F22037 | 5 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | SW8270 | 6/26/04 | 7:27 | 4F22047 | 1 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | SW8270 | 6/30/04 | 19:09 | 4F22047 | 1 |
| Soil | HS-MW-13D-8-10 | 6/16/04 | B4F0626-24 | B4F0626 | SW8270 | 6/30/04 | 2:48 | 4F22047 | 10 |
| Soil | HS-MW-15A-8-10 | 6/18/04 | B4F0701-04 | B4F0701 | Solids, Dry Weight | 6/26/04 | 12:20 | 4F25024 | 1 |
| Soil | HS-MW-15A-8-10 | 6/18/04 | B4F0701-04 | B4F0701 | SW8270 | 7/12/04 | 16:54 | 4F25028 | 10 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | HS-MW-15A-8-10 | 6/18/04 | B4F0701-04 | B4F0701 | SW8270 | 7/7/04 | 14:29 | 4F25028 | 1 |
| Soil | HS-MW-16-9-10 | 6/17/04 | B4F0627-04 | B4F0627 | NWTPH-DxSG | 6/29/04 | 21:13 | 4F28032 | 1 |
| Soil | HS-MW-16-9-10 | 6/17/04 | B4F0627-04 | B4F0627 | NWTPH-HCID | 6/23/04 | 9:51 | 4F22056 | 1 |
| Soil | HS-MW-16-9-10 | 6/17/04 | B4F0627-04 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | NWTPH-DxSG | 6/24/04 | 12:46 | 4F22037 | 5 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | NWTPH-DxSG | 6/24/04 | 5:28 | 4F22037 | 1 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | SW8270 | 6/30/04 | 21:23 | 4F22047 | 1 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | SW8270 | 6/26/04 | 10:09 | 4F22047 | 1 |
| Soil | IZ-DP-1-3-4 | 6/17/04 | B4F0627-23 | B4F0627 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | GC/MS SIM PAH | 7/6/04 | 16:58 | 4F22047 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | NWTPH-DxSG | 6/24/04 | 4:57 | 4F22037 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | SW8270 | 6/26/04 | 9:42 | 4F22047 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | SW8270 | 6/30/04 | 20:57 | 4F22047 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | SW8270 | 7/6/04 | 16:58 | 4F22047 | 1 |
| Soil | IZ-MW-1-4-5 | 6/17/04 | B4F0627-19 | B4F0627 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | GC/MS SIM PAH | 7/6/04 | 16:28 | 4F22047 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | NWTPH-DxSG | 6/24/04 | 12:46 | 4F22037 | 5 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | SW8270 | 6/26/04 | 9:15 | 4F22047 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | SW8270 | 6/30/04 | 20:30 | 4F22047 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | SW8270 | 7/6/04 | 16:28 | 4F22047 | 1 |
| Soil | IZ-MW-2-2-4 | 6/17/04 | B4F0627-15 | B4F0627 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | NWTPH-DxSG | 6/24/04 | 11:41 | 4F22037 | 10 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | SW8270 | 6/30/04 | 19:36 | 4F22047 | 1 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | SW8270 | 6/26/04 | 8:21 | 4F22047 | 1 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | SW8290 | 7/16/04 | 0:00 | X299 | 1 |
| Soil | IZ-MW-3-2-4 | 6/17/04 | B4F0627-08 | B4F0627 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | GC/MS SIM PAH | 7/6/04 | 15:59 | 4F22047 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | NWTPH-DxSG | 6/24/04 | 12:13 | 4F22037 | 5 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | SW8270 | 7/6/04 | 15:59 | 4F22047 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | SW8270 | 6/30/04 | 20:03 | 4F22047 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | SW8270 | 6/26/04 | 8:48 | 4F22047 | 1 |
| Soil | IZ-MW-4-1-4 | 6/17/04 | B4F0627-12 | B4F0627 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | TL-DP-2-12-15 | 6/21/04 | B4F0746-16 | B4F0746 | GC/MS SIM PAH | 7/6/04 | 18:54 | 4F28028 | 1 |
| Soil | TL-DP-2-12-15 | 6/21/04 | B4F0746-16 | B4F0746 | NWTPH-DxSG | 6/28/04 | 9:58 | 4F25034 | 1 |
| Soil | TL-DP-2-12-15 | 6/21/04 | B4F0746-16 | B4F0746 | Solids, Dry Weight | 6/26/04 | 12:20 | 4F25024 | 1 |
| Soil | TL-DP-2-12-15 | 6/21/04 | B4F0746-16 | B4F0746 | SW8270 | 7/6/04 | 18:54 | 4F28028 | 1 |
| Soil | TL-DP-2-12-15 | 6/21/04 | B4F0746-16 | B4F0746 | SW8270 | 6/29/04 | 22:52 | 4F28028 | 1 |
| Soil | TL-DP-2-2-4 | 6/21/04 | B4F0746-11 | B4F0746 | Solids, Dry Weight | 6/28/04 | 10:20 | 4F27008 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | TL-DP-2-2-4 | 6/21/04 | B4F0746-11 | B4F0746 | SW8270 | 6/29/04 | 21:31 | 4F28028 | 1 |
| Soil | TL-DP-2-2-4 | 6/21/04 | B4F0746-11 | B4F0746 | SW8270 | 6/30/04 | 18:15 | 4F28028 | 10 |
| Soil | TL-DP-2-6-8 | 6/21/04 | B4F0746-13 | B4F0746 | NWTPH-DxSG | 6/30/04 | 0:04 | 4F28032 | 1 |
| Soil | TL-DP-2-6-8 | 6/21/04 | B4F0746-13 | B4F0746 | NWTPH-DxSG | 6/30/04 | 13:11 | 4F28032 | 10 |
| Soil | TL-DP-2-6-8 | 6/21/04 | B4F0746-13 | B4F0746 | Solids, Dry Weight | 6/28/04 | 10:20 | 4F27008 | 1 |
| Soil | TL-DP-2-6-8 | 6/21/04 | B4F0746-13 | B4F0746 | SW8270 | 6/29/04 | 21:58 | 4F28028 | 1 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/12/04 | 18:12 | 4F28030 | 40 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/12/04 | 18:12 | [CALC] | 40 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/9/04 | 22:36 | 4F28030 | 20 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | NWTPH-DxSG | 6/30/04 | 12:02 | 4F28032 | 100 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | NWTPH-DxSG | 6/30/04 | 0:39 | 4F28032 | 20 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | Solids, Dry Weight | 6/28/04 | 10:20 | 4F27008 | 1 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8260B | 7/7/04 | 3:08 | 4G07044 | 20 |
| Soil | TL-DP-2-6-8 | 6/21/04 | B4F0746-13 | B4F0746 | SW8270 | 6/29/04 | 21:58 | 4F28028 | 1 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/12/04 | 18:12 | 4F28030 | 40 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/12/04 | 18:12 | [CALC] | 40 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | EPH | 7/9/04 | 22:36 | 4F28030 | 20 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | NWTPH-DxSG | 6/30/04 | 12:02 | 4F28032 | 100 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | NWTPH-DxSG | 6/30/04 | 0:39 | 4F28032 | 20 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | Solids, Dry Weight | 6/28/04 | 10:20 | 4F27008 | 1 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8260B | 7/7/04 | 3:08 | 4G07044 | 20 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8260B | 7/7/04 | 20:45 | 4G07044 | 5 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8270 | 6/30/04 | 2:08 | 4F28028 | 10 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8270 | 6/30/04 | 13:15 | 4F28028 | 200 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8270 | 6/30/04 | 12:19 | 4F28028 | 10 |
| Soil | TL-DP-2-8-10 | 6/21/04 | B4F0746-14 | B4F0746 | SW8270 | 6/29/04 | 22:25 | 4F28028 | 1 |
| Soil | TL-DP-4-10-12 | 6/21/04 | B4F0746-35 | B4F0746 | GC/MS SIM PAH | 7/6/04 | 19:23 | 4F28028 | 1 |
| Soil | TL-DP-4-10-12 | 6/21/04 | B4F0746-35 | B4F0746 | NWTPH-DxSG | 6/30/04 | 0:39 | 4F28032 | 1 |
| Soil | TL-DP-4-10-12 | 6/21/04 | B4F0746-35 | B4F0746 | Solids, Dry Weight | 6/28/04 | 10:20 | 4F27008 | 1 |
| Soil | TL-DP-4-10-12 | 6/21/04 | B4F0746-35 | B4F0746 | SW8270 | 7/6/04 | 19:23 | 4F28028 | 1 |
| Soil | TL-DP-4-10-12 | 6/21/04 | B4F0746-35 | B4F0746 | SW8270 | 6/29/04 | 23:19 | 4F28028 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | GC/MS SIM PAH | 7/12/04 | 17:52 | 4F22048 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | NWTPH-DxSG | 6/24/04 | 13:40 | 4F22042 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | SW8270 | 7/12/04 | 17:52 | 4F22048 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | SW8270 | 6/25/04 | 15:37 | 4F22048 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | SW8270 | 6/30/04 | 14:36 | 4F22048 | 1 |
| Soil | TL-HA-1-0-1 | 6/14/04 | B4F0617-08 | B4F0617 | SW8290 | 7/16/04 | 0:00 | X299 | 1 |
| Soil | TL-HA-2-0-1 | 6/14/04 | B4F0617-07 | B4F0617 | GC/MS SIM PAH | 7/12/04 | 17:23 | 4F22048 | 1 |
| Soil | TL-HA-2-0-1 | 6/14/04 | B4F0617-07 | B4F0617 | NWTPH-DxSG | 6/24/04 | 13:17 | 4F22042 | 1 |
| Soil | TL-HA-2-0-1 | 6/14/04 | B4F0617-07 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | TL-HA-2-0-1 | 6/14/04 | B4F0617-07 | B4F0617 | SW8270 | 7/12/04 | 17:23 | 4F22048 | 1 |
| Soil | TL-HA-2-0-1 | 6/14/04 | B4F0617-07 | B4F0617 | SW8270 | 6/30/04 | 14:09 | 4F22048 | 1 |
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | GC/MS SIM PAH | 7/3/04 | 21:05 | 4F22048 | 1 |
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | NWTPH-DxSG | 6/24/04 | 12:54 | 4F22042 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | Solids, Dry Weight | 6/23/04 | 0:00 | 4F22044 | 1 |
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | SW8270 | 6/25/04 | 14:02 | 4F22048 | 1 |
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | SW8270 | 6/30/04 | 13:42 | 4F22048 | 1 |
| Soil | TL-HA-3-0-1 | 6/14/04 | B4F0617-06 | B4F0617 | SW8270 | 7/3/04 | 21:05 | 4F22048 | 1 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | EPH | 7/9/04 | 21:14 | [CALC] | 10 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | EPH | 7/9/04 | 21:14 | 4F28030 | 10 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | GC/MS SIM PAH | 6/23/04 | 20:55 | 4F22047 | 1 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | NWTPH-DxSG | 6/24/04 | 3:53 | 4F22037 | 40 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | SW8260B | 6/30/04 | 22:35 | 4F30034 | 1 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | SW8270 | 6/30/04 | 3:15 | 4F22047 | 10 |
| Soil | TL-MW-10-12-13 | 6/16/04 | B4F0626-54 | B4F0626 | SW8270 | 6/26/04 | 7:54 | 4F22047 | 1 |
| Soil | TL-MW-10-16-18 | 6/16/04 | B4F0626-56 | B4F0626 | NWTPH-DxSG | 6/24/04 | 3:53 | 4F22037 | 1 |
| Soil | TL-MW-10-16-18 | 6/16/04 | B4F0626-56 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | TL-MW-10-20-22 | 6/16/04 | B4F0626-58 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | TL-MW-10-20-22 | 6/16/04 | B4F0626-58 | B4F0626 | SW9060 | 6/23/04 | 0:00 | 4F24005 | 1 |
| Soil | TL-MW-10-5.5-8 | 6/16/04 | B4F0626-52 | B4F0626 | NWTPH-DxSG | 6/24/04 | 2:49 | 4F22037 | 5 |
| Soil | TL-MW-10-5.5-8 | 6/16/04 | B4F0626-52 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | TL-MW-10-8-12 | 6/16/04 | B4F0626-53 | B4F0626 | NWTPH-DxSG | 6/24/04 | 3:21 | 4F22037 | 10 |
| Soil | TL-MW-10-8-12 | 6/16/04 | B4F0626-53 | B4F0626 | Solids, Dry Weight | 6/23/04 | 9:30 | 4F22041 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | GC/MS SIM PAH | 7/12/04 | 18:50 | 4F30040 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | NWTPH-DxSG | 6/29/04 | 22:55 | 4F28032 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | Solids, Dry Weight | 6/30/04 | 9:30 | 4F29011 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | SW8270 | 7/12/04 | 18:50 | 4F30040 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | SW8270 | 7/6/04 | 22:57 | 4F30040 | 1 |
| Soil | TL-MW-11-17-18 | 6/18/04 | B4F0701-21 | B4F0701 | SW8270 | 7/7/04 | 0:53 | 4F30040 | 1 |
| Groundwater | CL-MW-1-062404 | 6/24/04 | B4F0789-02 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | CL-MW-1-062404 | 6/24/04 | B4F0789-02 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | CL-MW-1-062404 | 6/24/04 | B4F0789-02 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 5 |
| Groundwater | CL-MW-1-062404 | 6/24/04 | B4F0789-02 | B4F0789 | NWTPH-DxSG | 7/1/04 | 1:08 | 4F29019 | 1 |
| Groundwater | CL-MW-1-062404 | 6/24/04 | B4F0789-02 | B4F0789 | SW9060 | 6/30/04 | 10:29 | 4F30026 | 3 |
| Groundwater | CL-MW-1D-062204 | 6/22/04 | B4F0745-04 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 1 |
| Groundwater | CL-MW-1D-062204 | 6/22/04 | B4F0745-04 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | CL-MW-1D-062204 | 6/22/04 | B4F0745-04 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 2 |
| Groundwater | CL-MW-1D-062204 | 6/22/04 | B4F0745-04 | B4F0745 | NWTPH-DxSG | 6/28/04 | 21:29 | 4F26002 | 1 |
| Groundwater | CL-MW-1D-062204 | 6/22/04 | B4F0745-04 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 1 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 2 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | NWTPH-DxSG | 7/1/04 | 1:43 | 4F29019 | 1 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | SW8270 | 7/9/04 | 2:10 | 4G01015 | 10 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | SW8270 | 7/7/04 | 6:53 | 4G01015 | 1 |
| Groundwater | CL-MW-1H-062404 | 6/24/04 | B4F0789-05 | B4F0789 | SW9060 | 6/30/04 | 10:29 | 4F30026 | 1 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 1 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 4 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | NWTPH-DxSG | 6/28/04 | 21:06 | 4F26002 | 1 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | SW8270 | 7/9/04 | 0:22 | 4G01015 | 10 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | SW8270 | 7/14/04 | 18:59 | 4G01015 | 500 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | SW8270 | 7/14/04 | 18:01 | 4G01015 | 100 |
| Groundwater | CL-MW-1S-062204 | 6/22/04 | B4F0745-03 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 2 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 1 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | NWTPH-DxSG | 7/1/04 | 1:08 | 4F29019 | 1 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | SW8270 | 7/7/04 | 6:23 | 4G01015 | 1 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | SW8270 | 7/9/04 | 1:43 | 4G01015 | 10 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | SW8270 | 7/12/04 | 21:40 | 4G01015 | 100 |
| Groundwater | CL-MW-6-062404 | 6/24/04 | B4F0789-03 | B4F0789 | SW9060 | 6/30/04 | 10:29 | 4F30026 | 1 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 10 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | NWTPH-DxSG | 6/30/04 | 21:41 | 4F29019 | 1 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | SW8270 | 7/7/04 | 5:53 | 4G01015 | 1 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | SW8270 | 7/12/04 | 21:12 | 4G01015 | 100 |
| Groundwater | CL-MW-7-062404 | 6/24/04 | B4F0789-01 | B4F0789 | SW9060 | 6/30/04 | 10:29 | 4F30026 | 5 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 2 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04RE1 | B4F0789 | NWTPH-DxSG | 7/6/04 | 19:10 | 4G02017 | 1 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | SW8270 | 7/7/04 | 3:24 | 4F30017 | 1 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | SW8270 | 7/9/04 | 17:11 | 4F30017 | 100 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04RE2 | B4F0789 | SW8270 | 7/14/04 | 18:31 | 4G10016 | 100 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04RE2 | B4F0789 | SW8270 | 7/14/04 | 20:51 | 4G10016 | 10 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04RE2 | B4F0789 | SW8270 | 7/15/04 | 12:57 | 4G10016 | 1 |
| Groundwater | H-MW-2-062404 | 6/24/04 | B4F0789-04 | B4F0789 | SW9060 | 6/30/04 | 10:29 | 4F30026 | 1 |
| Groundwater | HS-D-062304 | 6/23/04 | B4F0745-13 | B4F0745 | NWTPH-DxSG | 6/28/04 | 23:23 | 4F26002 | 1 |
| Groundwater | HS-D-062304 | 6/23/04 | B4F0745-13 | B4F0745 | SW8270 | 7/8/04 | 23:02 | 4F26008 | 1 |
| Groundwater | HS-D-062304 | 6/23/04 | B4F0745-13 | B4F0745 | SW8270 | 7/9/04 | 4:24 | 4F26008 | 10 |
| Groundwater | HS-D-062304 | 6/23/04 | B4F0745-13 | B4F0745 | SW8270 | 7/14/04 | 14:45 | 4F26008 | 1000 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10RE1 | B4F0745 | EPH | 8/7/04 | 7:59 | 4G25014 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10RE1 | B4F0745 | EPH | 8/7/04 | 7:59 | [CALC] | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | EPH | 7/16/04 | 2:27 | [CALC] | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | EPH | 7/16/04 | 2:27 | 4F25014 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | N2520 | 6/28/04 | 0:00 | 4F28042 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | NWTPH-DxSG | 6/28/04 | 23:01 | 4F26002 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW6020 | 7/1/04 | 11:24 | 4061240 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW6020 | 6/28/04 | 10:00 | 4F25018 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW6020 | 7/1/04 | 10:33 | 4061242 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW6020 | 6/28/04 | 11:21 | 4F25042 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW7196 | 6/23/04 | 16:00 | 4F25017 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW8260B | 6/29/04 | 12:58 | 4F25043 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW8270 | 7/8/04 | 21:41 | 4F26008 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW8270 | 7/9/04 | 3:04 | 4F26008 | 10 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW8270 | 7/12/04 | 23:04 | 4F26008 | 100 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW8290 | 7/24/04 | 0:00 | X303 | 1 |
| Groundwater | HS-MW-10-062304 | 6/23/04 | B4F0745-10 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | E300 | 6/25/04 | 10:00 | 4F26006 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11RE1 | B4F0745 | EPH | 8/7/04 | 8:39 | 4G25014 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11RE1 | B4F0745 | EPH | 8/7/04 | 8:39 | [CALC] | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | EPH | 7/16/04 | 3:07 | 4F25014 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | EPH | 7/16/04 | 3:07 | [CALC] | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | N2520 | 6/28/04 | 0:00 | 4F28042 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | NWTPH-DxSG | 6/28/04 | 23:01 | 4F26002 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | NWTPH-DxSG | 6/29/04 | 9:17 | 4F26002 | 5 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW6020 | 7/1/04 | 11:38 | 4061240 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW6020 | 7/1/04 | 10:47 | 4061242 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW6020 | 6/28/04 | 11:26 | 4F25042 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW6020 | 6/28/04 | 10:06 | 4F25018 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW7196 | 6/23/04 | 16:00 | 4F25017 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW8260B | 6/29/04 | 13:30 | 4F25043 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW8260B | 6/29/04 | 14:33 | 4F25043 | 5 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW8270 | 7/9/04 | 3:30 | 4F26008 | 10 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW8270 | 7/12/04 | 23:32 | 4F26008 | 1000 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW8270 | 7/8/04 | 22:08 | 4F26008 | 1 |
| Groundwater | HS-MW-11-062304 | 6/23/04 | B4F0745-11 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | E300 | 6/25/04 | 10:00 | 4F26006 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | EPH | 7/16/04 | 3:47 | [CALC] | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | EPH | 7/16/04 | 3:47 | 4F25014 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12RE1 | B4F0745 | EPH | 8/7/04 | 9:19 | [CALC] | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12RE1 | B4F0745 | EPH | 8/7/04 | 9:19 | 4G25014 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | N2520 | 6/28/04 | 0:00 | 4F28042 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | NWTPH-DxSG | 6/28/04 | 23:23 | 4F26002 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW6020 | 6/28/04 | 11:32 | 4F25042 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW6020 | 6/28/04 | 10:12 | 4F25018 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW6020 | 7/1/04 | 11:43 | 4061240 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW6020 | 7/1/04 | 11:01 | 4061242 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW7196 | 6/23/04 | 16:00 | 4F25017 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW8260B | 6/29/04 | 14:01 | 4F25043 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW8270 | 7/12/04 | 23:59 | 4F26008 | 1000 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW8270 | 7/8/04 | 22:34 | 4F26008 | 1 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW8270 | 7/9/04 | 3:58 | 4F26008 | 10 |
| Groundwater | HS-MW-13-062304 | 6/23/04 | B4F0745-12 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 200 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 4 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | NWTPH-DxSG | 6/28/04 | 20:43 | 4F26002 | 1 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | SW8270 | 7/14/04 | 22:48 | 4F26008 | 10 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | SW8270 | 7/7/04 | 19:07 | 4F26008 | 1 |
| Groundwater | HS-MW-15-062204 | 6/22/04 | B4F0745-02 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 2 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 500 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 4 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | NWTPH-DxSG | 6/28/04 | 20:20 | 4F26002 | 1 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | SW8270 | 7/14/04 | 22:20 | 4F26008 | 10 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | SW8270 | 7/7/04 | 17:39 | 4F26008 | 1 |
| Groundwater | HS-MW-16-062204 | 6/22/04 | B4F0745-01 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 2 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | E353.2 | 6/24/04 | 0:00 | 4F24058 | 1 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | E415.1 | 7/3/04 | 0:00 | 4G04001 | 10 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | NWTPH-DxSG | 6/29/04 | 17:21 | 4F28015 | 1 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | SW8270 | 7/7/04 | 17:09 | 4F26008 | 1 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | SW8270 | 7/9/04 | 16:26 | 4F26008 | 100 |
| Groundwater | HS-MW-4-062304 | 6/23/04 | B4F0725-05 | B4F0725 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | E300 | 7/1/04 | 0:00 | 4G01048 | 5 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | E353.2 | 6/24/04 | 0:00 | 4F24058 | 1 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | E415.1 | 7/3/04 | 0:00 | 4G04001 | 2 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | NWTPH-DxSG | 6/29/04 | 16:58 | 4F28015 | 1 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | SW8270 | 7/14/04 | 20:23 | 4F26008 | 10 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | SW8270 | 7/7/04 | 16:40 | 4F26008 | 1 |
| Groundwater | HS-MW-5-062304 | 6/23/04 | B4F0725-04 | B4F0725 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 2 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | E353.2 | 6/25/04 | 0:00 | 4F28023 | 1 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 2 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | NWTPH-DxSG | 7/1/04 | 2:17 | 4F29019 | 1 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | SW8270 | 7/9/04 | 1:16 | 4F30017 | 10 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | SW8270 | 7/10/04 | 21:51 | 4F30017 | 500 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06RE2 | B4F0789 | SW8270 | 7/15/04 | 1:34 | 4G10016 | 10 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06RE2 | B4F0789 | SW8270 | 7/15/04 | 13:25 | 4G10016 | 1 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | SW8270 | 7/7/04 | 3:54 | 4F30017 | 1 |
| Groundwater | HS-MW-6-062404 | 6/24/04 | B4F0789-06 | B4F0789 | SW9060 | 6/30/04 | 10:18 | 4F30026 | 2 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | E300 | 7/1/04 | 0:00 | 4G01048 | 1 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | E353.2 | 6/24/04 | 0:00 | 4F24058 | 1 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | E415.1 | 7/3/04 | 0:00 | 4G04001 | 10 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | NWTPH-DxSG | 6/29/04 | 16:35 | 4F28015 | 1 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | SW8270 | 7/7/04 | 16:11 | 4F26008 | 1 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | SW8270 | 7/14/04 | 19:55 | 4F26008 | 10 |
| Groundwater | HS-MW-9-062304 | 6/23/04 | B4F0725-03 | B4F0725 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 200 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08RE1 | B4F0745 | EPH | 8/7/04 | 4:38 | 4G25014 | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08RE1 | B4F0745 | EPH | 8/7/04 | 4:38 | [CALC] | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | EPH | 7/15/04 | 22:26 | 4F25014 | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | EPH | 7/15/04 | 22:26 | [CALC] | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | NWTPH-DxSG | 6/28/04 | 22:38 | 4F26002 | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | SW8260B | 6/29/04 | 11:54 | 4F25043 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | SW8270 | 7/8/04 | 20:48 | 4F26008 | 1 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | SW8270 | 7/15/04 | 0:11 | 4F26008 | 10 |
| Groundwater | IZ-MW-1-062204 | 6/22/04 | B4F0745-08 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 100 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06RE1 | B4F0745 | EPH | 8/7/04 | 3:18 | 4G25014 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06RE1 | B4F0745 | EPH | 8/7/04 | 3:18 | [CALC] | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | EPH | 7/15/04 | 21:06 | 4F25014 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | EPH | 7/15/04 | 21:06 | [CALC] | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | NWTPH-DxSG | 6/28/04 | 22:15 | 4F26002 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | SW8260B | 6/29/04 | 10:50 | 4F25043 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | SW8270 | 7/8/04 | 19:18 | 4F26008 | 1 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | SW8270 | 7/14/04 | 23:15 | 4F26008 | 10 |
| Groundwater | IZ-MW-2-062204 | 6/22/04 | B4F0745-06 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 200 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | EPH | 7/15/04 | 20:26 | [CALC] | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | EPH | 7/15/04 | 20:26 | 4F25014 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05RE1 | B4F0745 | EPH | 8/7/04 | 2:37 | [CALC] | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05RE1 | B4F0745 | EPH | 8/7/04 | 2:37 | 4G25014 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | NWTPH-DxSG | 6/28/04 | 21:51 | 4F26002 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | SW8260B | 6/29/04 | 10:19 | 4F25043 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | SW8270 | 7/15/04 | 1:06 | 4F26008 | 10 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | SW8270 | 7/8/04 | 17:50 | 4F26008 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | SW8290 | 7/24/04 | 0:00 | X303 | 1 |
| Groundwater | IZ-MW-3-062204 | 6/22/04 | B4F0745-05 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 20 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | E415.1 | 6/26/04 | 0:00 | 4F27003 | 10 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07RE1 | B4F0745 | EPH | 8/7/04 | 3:58 | [CALC] | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07RE1 | B4F0745 | EPH | 8/7/04 | 3:58 | 4G25014 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | EPH | 7/15/04 | 21:46 | 4F25014 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | EPH | 7/15/04 | 21:46 | [CALC] | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | NWTPH-DxSG | 6/28/04 | 22:15 | 4F26002 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | SW8260B | 6/29/04 | 11:22 | 4F25043 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | SW8270 | 7/8/04 | 19:54 | 4F26008 | 1 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | SW8270 | 7/14/04 | 23:43 | 4F26008 | 10 |
| Groundwater | IZ-MW-4-062204 | 6/22/04 | B4F0745-07 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |
| Groundwater | RINSATE 062104 | 6/21/04 | B4F0746-09 | B4F0746 | NWTPH-DxSG | 6/28/04 | 23:47 | 4F26002 | 1 |
| Groundwater | RINSATE 062104 | 6/21/04 | B4F0746-09 | B4F0746 | SW8270 | 7/14/04 | 15:13 | 4F26008 | 10 |
| Groundwater | RINSATE 062104 | 6/21/04 | B4F0746-09 | B4F0746 | SW8270 | 7/7/04 | 13:54 | 4F26008 | 1 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | E300 | 6/30/04 | 0:00 | 4G01004 | 50 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | E353.2 | 6/24/04 | 0:00 | 4F24058 | 1 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | E415.1 | 7/3/04 | 0:00 | 4G04001 | 10 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | EPH | 7/15/04 | 19:45 | 4F25014 | 1 |

# TABLE 1 (Continued)

| Matrix | Sample Identifier | Sample Date | Laboratory Sample ID | Sample Delivery Group | Analysis Method | Analysis Date | Analysis Time | Batch Identifier | Dilution Factor |
|---|---|---|---|---|---|---|---|---|---|
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | EPH | 7/15/04 | 19:45 | [CALC] | 1 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01RE1 | B4F0725 | EPH | 8/7/04 | 1:57 | 4G25014 | 5 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01RE1 | B4F0725 | EPH | 8/7/04 | 1:57 | [CALC] | 5 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | NWTPH-DxSG | 6/29/04 | 15:48 | 4F28015 | 1 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | SW8270 | 7/8/04 | 20:21 | 4F26008 | 100 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | SW8270 | 7/7/04 | 15:12 | 4F26008 | 1 |
| Groundwater | TL-MW-10-062304 | 6/23/04 | B4F0725-01 | B4F0725 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 10 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | E300 | 6/26/04 | 0:00 | 4F27001 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | E353.2 | 6/23/04 | 17:30 | 4F25001 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | E415.1 | 6/27/04 | 0:00 | 4F27013 | 5 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | EPH | 7/15/04 | 23:07 | [CALC] | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | EPH | 7/15/04 | 23:07 | 4F25014 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09RE1 | B4F0745 | EPH | 8/7/04 | 7:19 | [CALC] | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09RE1 | B4F0745 | EPH | 8/7/04 | 7:19 | 4G25014 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | NWTPH-DxSG | 6/28/04 | 22:38 | 4F26002 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | SW8260B | 6/29/04 | 12:26 | 4F25043 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | SW8270 | 7/12/04 | 22:36 | 4F26008 | 100 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | SW8270 | 7/8/04 | 21:14 | 4F26008 | 1 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | SW8270 | 7/9/04 | 2:37 | 4F26008 | 10 |
| Groundwater | TL-MW-11-062204 | 6/22/04 | B4F0745-09 | B4F0745 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 10 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | E300 | 6/30/04 | 0:00 | 4G01004 | 50 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | E353.2 | 6/24/04 | 0:00 | 4F24058 | 1 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | E415.1 | 7/7/04 | 10:36 | 4G08021 | 5 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | NWTPH-DxSG | 6/29/04 | 16:12 | 4F28015 | 1 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | SW8270 | 7/7/04 | 15:42 | 4F26008 | 1 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | SW8270 | 7/8/04 | 23:55 | 4F26008 | 10 |
| Groundwater | TL-MW-9-062304 | 6/23/04 | B4F0725-02 | B4F0725 | SW9060 | 6/25/04 | 0:00 | 4F26007 | 5 |

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# TABLE 2
# SAMPLE QUALIFICATION SUMMARY
## FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
## BELLINGHAM, WASHINGTON

| SDG | Method | Action | Affected Samples |
|---|---|---|---|
| B4F0745 | Ecology EPH | Qualify results as estimated (J or UJ) due to low blank spike recoveries for the following analytes:<br>ALIPHATICS EC8-EC10<br>ALIPHATICS EC10-EC12<br>ALIPHATICS EC12-EC16<br>AROMATICS EC8-EC10<br>AROMATICS EC10-EC12<br>AROMATICS EC12-EC16<br>EXCTACTABLE PETROLIUM HYDROCARBONS | HS-MW-10-062304<br>HS-MW-11-062304<br>HS-MW-13-062304<br>IZ-MW-2-062204<br>IZ-MW-2-062204<br>IZ-MW-3-062204<br>IZ-MW-4-062204<br>TL-MW-11-062204 |
| B4F0725 | Ecology EPH | Batch QC control for the original results were out and the reextracted results were utilized. Qualify all detected results as estimated (J) due to missed holding times<br>ALIPHATICS EC8-EC10<br>ALIPHATICS EC10-EC12<br>ALIPHATICS EC12-EC16<br>AROMATICS EC10-EC12<br>AROMATICS EC12-EC16<br>EXCTACTABLE PETROLIUM HYDROCARBONS | TL-MW-10-062304 |
| B4F0725 | Ecology EPH | Result for AROMATICS EC8-EC10 rejected due to missed batch QC for the original sample and missed holding times for the reextract. | TL-MW-10-062304 |
| B4F0789 | SW-846 8270C | Due to holding time exceedance of reextract, qualify results as estimated (J or UJ) | H-MW-2-02062404-RE |
| B4F0789 | SW-846 8270C | Due to holding time exceedance of reextract, qualify results as estimated (J or UJ) | HS-MW-6-062404-RE |
| B4F0626 | GC/MS SIM PAH | Qualify detected results as estimated (J) and reject nondetect values (R) due to low internal standards for the following compounds<br>BENZ(A)ANTHRACENE<br>BENZO(A)PYRENE<br>BENZO(B)FLUORANTHENE<br>BENZO(GHI)PERYLENE<br>BENZO(K)FLUORANTHENE<br>CHRYSENE<br>DIBENZ(A,H)ANTHRACENE<br>INDENO(1,2,3-CD)PYRENE | TL-MW-10-12-13 |
| B4F0621 | SW8260B | Qualify results as estimated (J or UJ) due to slightly missed holding time | HS-DP-6-8-10 |
| B4F0745 | Ecology EPH | Qualify non-detect results as rejected (R) and detected results estimated (J) due to grossly exceeded holding times | IZ-MW-3-062204-RE<br>IZ-MW-2-062204-RE<br>IZ-MW-4-062204-RE<br>IZ-MW-1-062204-RE |
| | | | TL-MW-11-062204-RE<br>HS-MW-10-062304-RE<br>HS-MW-11-062304-RE<br>HS-MW-13-062304-RE<br>TL-MW-11-062204-RE |

# TABLE 2 (Continued)

| SDG | Method | Action | Affected Samples |
|---|---|---|---|
| B4F0745 | SW-846 8270C | Qualify results as estimated (J or UJ) due to slightly missed holding time | CL-MW-1S-062204<br>HS-MW-6-062404<br>H-MW-2-062404-RE |
| B4F0621 | NWTPH-Dx | Qualify diesel as estimated (J) due to high surrogate recovery | HS-DP-5B-12-16 |
| B4F0621 | NWTPH-Dx | Qualify lube oil as estimated (J) due to high surrogate recovery | HS-DP-8-8-11 |
| B4F0627 | NWTPH-Dx | Qualify results as estimated (J) due to reported elevated surrogate recoveries. Recoveries cannot be completely | CL-MW-1D-12-13 |
| B4F0745 | Ecology EPH | Qualify results as estimtated (J or UJ) due to low surrogate recoveries. | HS-MW-13-062304 |
| B4F0745 | Ecology EPH | Qualify results as estimtated (J or UJ) due to low surrogate recoveries. | TL-MW-11-062204 |
| B4F0745 | SW-846 8270C | Qualify base/neutral and acid fractions as estimated (J or UJ) due to low surrogate recoveries | CL-MW-1S-062204 |
| B4F0725 | SW-846 8270C | Qualify detected results as estimated (J) and reject nondetect values (R) in the acid fraction due to extremely low | HS-MW-4-062304 |
| B4F0789 | SW-846 8270C | Low recoveries in the acid fraction of the LCS/LCSD surrogates, related target compounds, and low sample surrogate | HS-MW-6-062404 |
| B4F0745 | SW-846 8270C | Qualify acid fraction as estimated (J or UJ) due to low matrix spike recoveries | H-MW-2-062404<br>HS-MW-13-062304 |
| B4F0789 | E353.2 | Qualify all results as estimated (J or UJ) due to low matrix spike recoveries. | CL-MW-7-062404<br>CL-MW-1-062404<br>CL-MW-6-062404<br>H-MW-2-062404<br>CL-MW-1H-062404<br>HS-MW-6-062404 |
| B4F0745 | Ecology EPH | Qualify results as estimated (J/UJ) for reanalysis samples for the following compounds:<br>ALIPHATICS EC8-EC10<br>AROMATICS EC8-EC10 | TL-MW-10-062304-RE<br>IZ-MW-3-062204-RE<br>IZ-MW-2-062204-RE<br>IZ-MW-4-062204-RE<br>IZ-MW-1-062204-RE<br>TL-MW-11-062204-RE<br>HS-MW-10-062304-RE<br>HS-MW-11-062304-RE |
| B4F0626 | GC/MS SIM PAH | Qualify detects as estimated for pentachlorophenol due to low RRF in initial calibration | HS-MW-10-12-13<br>TL-MW-10-12-13<br>HS-MW-13D-8-10 |
| Various | SW-846 8270 | Qualify detected pentachlorophenol results as estimated due to a high %D in the CCV | HS-MW-4-062304<br>TL-MW-11-062204<br>HS-MW-10-062304<br>HS-D-062304<br>CL-MW-6-062404<br>CL-MW-1H-062404 |
| B4F0626 | GC/MS SIM PAH | Qualify detected pyrene results as estimated to a high %D in the CCV | HS-MW-10-12-13<br>HS-MW-13D-8-10<br>TL-MW-10-12-13 |

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# TABLE 3
# SAMPLES/ANALYSES EXCEEDING HOLDING TIMES
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Sample Delivery Group | Batch | Sample Identification | Sample Collection to Extraction (Days) | Sample Collection to Analysis (Days) | Holding Time (Days) | Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|---|
| B4F0621 | 4F30034 | HS-DP-6-8-10 | 15 | 15 | 14 | SW-846 8260B | Soil | None |
| B4F0725 | 4G25014 | TL-MW-10-062304-RE | 32 | 44 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | IZ-MW-3-062204-RE | 33 | 45 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | IZ-MW-2-062204-RE | 33 | 45 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | IZ-MW-4-062204-RE | 33 | 45 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | IZ-MW-1-062204-RE | 33 | 45 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | TL-MW-11-062204-RE | 33 | 45 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | HS-MW-10-062304-RE | 32 | 44 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | HS-MW-11-062304-RE | 32 | 44 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G25014 | HS-MW-13-062304-RE | 32 | 44 | 7 | Ecology EPH | Water | Yes |
| B4F0745 | 4G01015 | CL-MW-1S-062204 | 9 | 17, 22 | 7 | SW-846 8270C | Water | Yes |
| B4F0789 | 4G10016 | H-MW-2-062404-RE | 16 | 20, 21 | 7 | SW-846 8270C | Water | Yes |
| B4F0789 | 4G10016 | HS-MW-6-062404 | 16 | 21 | 7 | SW-846 8270C | Water | Yes |

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# TABLE 4
# METHOD BLANK DETECTIONS
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Sample Delivery Group | Batch | Sample Identification (Lab ID) | Analyte | Result | Analytical Method | Matrix |
|---|---|---|---|---|---|---|
| B4F0621 | X298 | Blank (0298-001-MB) | OCDD | 48.4 | SW-846 8290 | Soil |
| K2405633 | KWG0411384-5 | Method Blank | Phenol | 3.6 J | EPA 3541 (8270) | Sediment |
| K2405633 | KWG0411384-5 | Method Blank | Bis (2-ethylhexyl) Phthalate | 2.6 J | EPA 3541 (8270) | Sediment |

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# TABLE 5
# SURROGATE RECOVERIES OUTSIDE QC CRITERIA
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Sample Delivery Group | Batch | Surrogate Compound | Percent Recovery (%) | Recovery Limit (%) | Analytical Method | Matraix |
|---|---|---|---|---|---|---|
| NA | 4F22047 | Nitrobenzene-d5 | 105 | 46-103 | SW-846 8270 C-SIM | Soil |
| NA | 4F22048 | Nitrobenzene-d5 | 111 | 46-103 | SW-846 8270 C-SIM | Soil |
| NA | 4F25028 | 2-fluorophenol | 102 | 38-89 | SW-846 8270 C | Soil |
| NA | 4F28028 | 2,4,6-tribromophenol | 46.2 | 48-111 | SW-846 8270 C-SIM | Soil |
| NA | 4F30040 | 2-fluorophenol | 105 | 38-89 | SW-846 8270 C | Soil |
| NA | 4F22048 | Nitrobenzene-d5 | 111 | 46-103 | SW-846 8270 C-SIM | Soil |
| B4F0627 | 4F28032 | 2-fluorobiphenyl | 546 | 50-150 | NWTPH-Dx | Soil |
| B4F0627 | 4F28032 | Octoacosane | 834 | 50-150 | NWTPH-Dx | Soil |
| B4F0627 | 4F28028 | Nitrobenzene-d5 | 116 | 46-103 | SW-846 8270 C | Soil |
| B4F0745 | 4G01015 | 2-fluorobiphenyl | 32.8 | 56-104 | SW-846 8270 C | Water |
| B4F0745 | 4G01015 | 2-fluorophenol | 19.9 | 37-101 | SW-846 8270 C | Water |
| B4F0745 | 4G01015 | Nitrobenzene-d5 | 47.9 | 49-108 | SW-846 8270 C | Water |
| B4F0745 | 4G01015 | Phenol-d6 | 25 | 40-109 | SW-846 8270 C | Water |
| B4F0789 | 4G01015 | Phenol-d6 | 38.3 | 40-109 | SW-846 8270 C | Water |
| B4F0789 | 4F30017 | Phenol-d6 | 38.1 | 40-109 | SW-846 8270 C | Water |
| B4F0789 | 4F30017 | p-Terphenyl-d14 | 20.4 | 22-140 | SW-846 8270 C | Water |
| B4F0789 | 4G10016 | Phenol-d6 | 37.1 | 40-109 | SW-846 8270 C | Water |
| B4F0626 | 4F30040 | 2,4,6-tribromophenol | 112 | 48-111 | SW-846 8270 C | Soil |
| B4F0626 | 4F30040 | 2-fluorophenol | 105 | 38-89 | SW-846 8270 C | Soil |
| B4F0626 | 4F30040 | Phenol-d6 | 112 | 29-111 | SW-846 8270 C | Soil |
| B4F0626 | 4F30040 | 2-fluorophenol | 98 | 38-89 | SW-846 8270 C-SIM | Soil |
| B4F0621 | 4F22048 | 2-fluorophenol | 91.4 | 38-89 | SW-846 8270 C | Soil |
| B4F0621 | 4F22048 | Nitrobenzene-d5 | 141 | 46-103 | SW-846 8270 C | Soil |
| B4F0621 | 4F22042 | 2-fluorophenol | 166 | 50-150 | NW-TPH-Dx | Soil |
| B4F0621 | 4F22048 | Nitrobenzene-d5 | 32.2 | 46-103 | SW-846 8270 C | Soil |
| B4F0621 | 4F22042 | Octacosane | 172 | 50-150 | NW-TPH-Dx | Soil |
| B4F0621 | 4F22048 | 2,4,6-tribromophenol | 115 | 48-111 | SW-846 8270 C | Soil |
| B4F0621 | 4F22048 | Nitrobenzene-d5 | 159 | 46-103 | SW-846 8270 C | Soil |
| B4F0725 | 4F26008 | 2-fluorophenol | 35.8 | 37-101 | SW-846 8270 C | Water |
| B4F0725 | 4F26008 | 2-fluorophenol | 34.8 | 37-101 | SW-846 8270 C | Water |
| B4F0745 | 4G25014 | o-Terphenyl | 53 | 60-140 | Ecology EPH | Water |
| B4F0626 | 4F22047 | 2-fluorophenol | 91.3 | 38-89 | SW-846 8270 C | Soil |
| B4F0626 | 4F22047 | Nitrobenzene-d5 | 106 | 46-103 | SW-846 8270 C | Soil |
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# TABLE 6
# MATRIX SPIKE RECOVERIES OUTSIDE QC CRITERIA
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Sample Batch | Sample Identification | Spike Compound | Recovery (%) | Recovery Limit (%) | Analytical Method | Actions |
|---|---|---|---|---|---|---|
| 4F22037 | Matrix Spike (4F22037-MS1) | Diesel range hydrocarbons | 252 | 50-150 | NWTPH-Dx | None[1] |
| 4F22037 | Matrix Spike (4F22037-MS2) | Diesel-range hydorcarbons | 754 | 50-150 | NWTPH-Dx | None[1] |
| 4F22037 | Matrix Spike Dup (4F22037-MSD1) | Diesel-range hydorcarbons | 199 | 50-150 | NWTPH-Dx | None[1] |
| 4F22037 | Matrix Spike Dup (4F22037-MSD2) | Diesel-range hydorcarbons | 1790 | 50-150 | NWTPH-Dx | None[1] |
| 4F22047 | Matrix Spike (4F22047-MS1) | 2,4,5-Trichlorophenol | 113 | 56-96 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | 2,4,5-Trichlorophenol | 119 | 56-96 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | 2,4,6-Trichlorophenol | 136 | 56-96 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | 2,4,6-Trichlorophenol | 122 | 56-96 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | 2-Methylnaphthalene | -7020 | 41-93 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | 2-Methylnaphthalene | -7500 | 41-93 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Acenaphthene | 154 | 49-100 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Acenapthylene | 107 | 49-100 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Acenapthylene | 111 | 57-105 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Anthracene | 124 | 49-118 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Benzo (a) anthracene | 117 | 53-106 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Benzo (a) anthracene | 120 | 53-106 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Chrysene | 118 | 44-114 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Chrysene | 126 | 44-114 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Dibenzofuran | 41.9 | 45-103 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Dibenzofuran | 127 | 45-103 | SW-846 8270 C | None[2] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Fluorene | 118 | 43-111 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Fluorene | 195 | 43-111 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Naphthalene | 219 | 33-110 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike (4F22047-MS1) | N-Nitrosodiphenylamine | 47 | 70-130 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | N-Nitrosodiphenylamine | 57.3 | 70-130 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike (4F22047-MS1) | Phenanthrene | 185 | 44-106 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Phenanthrene | 352 | 44-106 | SW-846 8270 C | None[1] |
| 4F22047 | Matrix Spike Dup (4F22047-MSD1) | Pyrene | 141 | 21-136 | SW-846 8270 C | None[2] |
| 4F23014 | Matrix Spike Dup (4F23014-MSD1) | Hexavalent Chromium | 19 | 50-150 | SW-846 7196 | None[4] |
| 4F23014 | Matrix Spike (4F23014-MS1) | Hexavalent Chromium | 27 | 50-150 | SW-846 7196 | None[4] |

TABLE 6 (Continued)

| Sample Batch | Sample Identification | Spike Compound | Recovery (%) | Recovery Limit (%) | Analytical Method | Actions |
|---|---|---|---|---|---|---|
| 4F25017 | Matrix Spike (4F25017-MS1) | Hexavalent Chromium | 3.3 | 50-150 | SW-846 7196 | None[4] |
| 4F25028 | Matrix Spike (4F25028-MS1) | 2,3,4,5-Tetrachlorophenol | 31.2 | 50-150 | SW-846 8270 C | Yes |
| 4F25028 | Matrix Spike (4F25028-MS1) | 2,3,5,6-Tetrachlorophenol | 29.9 | 30-129 | SW-846 8270 C | Yes |
| 4F25028 | Matrix Spike Dup (4F25028-MSD1) | 2,4,5-Trichlorophenol | 98.3 | 56-96 | SW-846 8270 C | Yes |
| 4F25028 | Matrix Spike Dup (4F25028-MSD1) | 2-Methylnaphthalene | 98.1 | 41-93 | SW-846 8270 C | None[2] |
| 4F25028 | Matrix Spike (4F25028-MS1) | Pentachlorophenol | 17.4 | 30-129 | SW-846 8270 C | Yes |
| 4F28023 | Matrix Spike Dup (4F28023-MSD1) | Nitrate-Nitrogen | 15.6 | 36-150 | E353.2 | Yes |
| 4F28023 | Matrix Spike (4F28023-MS1) | Nitrate-Nitrogen | 14.4 | 36-150 | E353.2 | Yes |
| 4F28028 | Matrix Spike (4F28028-MS1) | 2,4,5-Trichlorophenol | 99.3 | 56-96 | SW-846 8270 C | None[2] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | 2,4,5-Trichlorophenol | 130 | 56-96 | SW-846 8270 C | None |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | 2,4,6-Trichlorophenol | 150 | 56-96 | SW-846 8270 C | None |
| 4F28028 | Matrix Spike (4F28028-MS1) | 2-Methylnaphthalene | -17100 | 41-93 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | 2-Methylnaphthalene | -21200 | 41-93 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Acenaphthene | 162 | 49-100 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Acenaphthene | 0 | 49-100 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Acenaphthylene | 108 | 57-105 | SW-846 8270 C | None[2] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Anthracene | 1.41 | 49-118 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Benzo (k) fluoranthene | 123 | 45-117 | SW-846 8270 C | None[2] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Dibenzofuran | 121 | 45-103 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Dibenzofuran | 34.2 | 45-103 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Fluorene | 268 | 43-111 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Fluorene | 0 | 43-111 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Naphthalene | 415 | 33-110 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Naphthalene | 295 | 33-110 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | N-Nitrosodiphenylamine | 35.2 | 70-130 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | N-Nitrosodiphenylamine | -288 | 70-130 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike (4F28028-MS1) | Phenanthrene | 704 | 44-106 | SW-846 8270 C | None[1] |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | Phenanthrene | 164 | 44-106 | SW-846 8270 C | None[1] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C10-C12 Aliphatics | 53.6 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C10-C12 Aromatics | 144 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C12-C16 Aliphatics | -63.7 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C12-C16 Aliphatics | -93.4 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C12-C16 Aromatics | 157 | 70-130 | Ecology EPH | None[3] |

TABLE 6 (Continued)

| Sample Batch | Sample Identification | Spike Compound | Recovery (%) | Recovery Limit (%) | Analytical Method | Actions |
|---|---|---|---|---|---|---|
| 4F28030 | Matrix Spike (4F28030-MS1) | C16-C21 Aliphatics | -584 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C16-C21 Aliphatics | 0 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C21-C34 Aliphatics | -417 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C21-C34 Aliphatics | -116 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C21-C34 Aromatics | -39.7 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C8-C10 Aliphatics | 32.9 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C8-C10 Aliphatics | 47 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike (4F28030-MS1) | C8-C10 Aromatics | 237 | 70-130 | Ecology EPH | None[3] |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C8-C10 Aromatics | 441 | 70-130 | Ecology EPH | None[3] |
| 4F22048 | Matrix Spike (4F22048-MS1) | Multiple aliphatics and aromatics | elevated | 70-130 | Ecology EPH | None[3] |
| 4F22048 | Matrix Spike Dup (4F22048-MSD1) | Multiple aliphatics and aromatics | elevated | 70-130 | Ecology EPH | None[3] |
| 4F22048 | Matrix Spike Dup (4F22048-MSD1) | Benzo (a) anthracene | 108 | 53-106 | SW-846 8270 C | None[2] |
| 4F28032 | Matrix Spike Dup (4F28032-MSD1) | Diesel range hydrocarbons | -99.1 | 50-150 | NWTPH-Dx | None[1] |
| 4F30040 | Matrix Spike (4F30040-MS1) | 2,4,5-Trichlorophenol | 112 | 56-96 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | 2,4,5-Trichlorophenol | 120 | 56-96 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | 2,4,6-Trichlorophenol | 108 | 56-96 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike (4F30040-MS1) | 2-Methylnaphthalene | 109 | 41-93 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | 2-Methylnaphthalene | 110 | 41-93 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Acenapthylene | 111 | 57-105 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Anthracene | 135 | 49-118 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (a) anthracene | 120 | 53-106 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (a) pyrene | 138 | 47-122 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (ghi) perylene | 129 | 39-124 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (k) fluoranthene | 163 | 45-117 | SW-846 8270 C | None |
| 4F30040 | Matrix Spike (4F30040-MS1) | Chrysene | 150 | 44-114 | SW-846 8270 C | None |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Chrysene | 217 | 44-114 | SW-846 8270 C | None |
| 4F30040 | Matrix Spike (4F30040-MS1) | Dibenzofuran | 112 | 45-103 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Dibenzofuran | 118 | 45-103 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Fluoranthene | 205 | 45-110 | SW-846 8270 C | None |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Fluorene | 112 | 43-111 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Indeno (1,2,3-cd) pyrene | 129 | 50-112 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike (4F30040-MS1) | Naphthalene | 123 | 33-110 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike (4F30040-MS1) | Pentachlorophenol | 139 | 30-129 | SW-846 8270 C | None[2] |

TABLE 6 (Continued)

| Sample Batch | Sample Identification | Spike Compound | Recovery (%) | Recovery Limit (%) | Analytical Method | Actions |
|---|---|---|---|---|---|---|
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Pentachlorophenol | 155 | 30-129 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike (4F30040-MS1) | Phenanthrene | 35.8 | 44-106 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Phenanthrene | 151 | 44-106 | SW-846 8270 C | None[2] |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Pyrene | 162 | 21-136 | SW-846 8270 C | None[2] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C10-C12 Aliphatics | 55 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike Dup (4G25014-MSD1) | C10-C12 Aliphatics | 55.9 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C10-C12 Aromatics | 44.3 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike Dup (4G25014-MSD1) | C10-C12 Aromatics | 43.3 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C12-C16 Aliphatics | 65.5 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C12-C16 Aromatics | 49 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike Dup (4G25014-MSD1) | C12-C16 Aromatics | 51.7 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C8-C10 Aliphatics | 44 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike Dup (4G25014-MSD1) | C8-C10 Aliphatics | 42.5 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike (4G25014-MS1) | C8-C10 Aromatics | 32.9 | 70-130 | Ecology EPH | None[3] |
| 4G25014 | Matrix Spike Dup (4G25014-MSD1) | C8-C10 Aromatics | 30.5 | 70-130 | Ecology EPH | None[3] |
| X299 | Matrix Spike Dup (2689-001-MSD) | OCDD | 218 | 50-150 | SW 846 8290 | None[4] |
| K2405633 | RI-1-0-4s | Mercury | 142 | 55-137 | 7471A | None[4] |

Notes:

[1]No action taken on MS/MSD recoveries when sample amounts are significantly greater than spike amount.

[2]No action taken. The percent recovery was outside project QC criteria but within laboratory control limits.

[3]No action taken when the source sample is not from the project site.

[4]No action taken. See data quality report for details.

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# TABLE 7
# LAB CONTROL SPIKE EXCEEDANCES
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Batch | Sample Identification (Lab ID) | Analyte | Recovery (%) | Recovery Limit (%) | Analytical Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|
| 4F22047 | LCS (4F22047-BS2) | Pentachlorophenol | 105 | 52-104 | GC/MS SIM | Soil | None[1] |
| 4F22047 | LCS Dup (4F22047-BSD2) | Pentachlorophenol | 121 | 52-104 | GC/MS SIM | Soil | None[1] |
| 4F22047 | LCS (4F22047-BS1) | N-Nitrosodiphenylamine | 68.8 | 70-130 | SW-846 8270 C | Soil | None[1] |
| 4F22047 | LCS Dup (4F22047-BSD1) | N-Nitrosodiphenylamine | 68.8 | 70-130 | SW-846 8270 C | Soil | None[1] |
| 4F22048 | LCS (4F22048-BS2) | Pentachlorophenol | 124 | 52-104 | GC/MS SIM | Soil | None[1] |
| 4F22048 | LCS Dup (4F22048-BSD2) | Pentachlorophenol | 118 | 52-104 | GC/MS SIM | Soil | None[1] |
| 4F24005 | LCS Dup (4F24005-BSD1) | Total Organic Carbon | 131 | 70-130 | EPA 415.1 | Soil | None |
| 4F25014 | LCS Dup (4F25014-BSD1) | C10-C12 Aliphatics | 67.4 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS (4F25014-BS1) | C10-C12 Aromatics | 52.9 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C10-C12 Aromatics | 48.5 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C12-C16 Aliphatics | 63 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C12-C16 Aromatics | 65 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS (4F25014-BS1) | C8-C10 Aliphatics | 46.8 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C8-C10 Aliphatics | 54.7 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4G25014-BDS1) | C8-C10 Aliphatics | 38.5 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS (4F25014-BS1) | C8-C10 Aromatics | 26 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS (4G25014-BS1) | C8-C10 Aromatics | 63.9 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C8-C10 Aromatics | 22.6 | 70-130 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4G25014-BDS1) | C8-C10 Aromatics | 54.8 | 70-130 | Ecology EPH | Water | Yes |
| 4F25028 | LCS Dup (4F25028-BSD2) | 2,3,5,6-Tetrachlorophenol | 112 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | 2,3,5,6-Tetrachlorophenol | 111 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | 2,4,5-Trichlorophenol | 106 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | 2,4,5-Trichlorophenol | 107 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | 2-Methylnaphthalene | 95.4 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | 2-Methylnaphthalene | 100 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Benzo (b) fluoranthene | 123 | 66-110 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Dibenzofuran | 99.1 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | Dibenzofuran | 99.6 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Fluorene | 103 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | Fluorene | 102 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Pentachlorophenol | 124 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS (4F25028-BS2) | Pentachlorophenol | 122 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Phenanthrene | 107 | 57-102 | SW-846 8270 C | Soil | None[1] |
| 4F25028 | LCS Dup (4F25028-BSD2) | Pyrene | 110 | 56-108 | SW-846 8270 C | Soil | None[1] |

TABLE 7 (Continued)

| Batch | Sample Identification (Lab ID) | Analyte | Recovery (%) | Recovery Limit (%) | Analytical Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|
| 4F26008 | LCS Dup (4F26008-BSD1) | Anthracene | 106 | 45-104 | SW-846 8270 C | Soil | None[1] |
| 4F26008 | LCS Dup (4F26008-BSD1) | Phenanthrene | 102 | 47-101 | SW-846 8270 C | Water | None[1] |
| 4F28028 | LCS (4F28028-BS1) | 2,3,5,6-Tetrachlorophenol | 121 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | 2,3,5,6-Tetrachlorophenol | 118 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | 2,4,5-Trichlorophenol | 107 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | 2,4,5-Trichlorophenol | 103 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | 2,4,6-Trichlorophenol | 107 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | 2,4,6-Trichlorophenol | 103 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | 2-Methylnaphthalene | 97.9 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | 2-Methylnaphthalene | 100 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Acenaphthalene | 99.4 | 58-98 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Acenaphthalene | 98.5 | 58-98 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Acenaphthene | 99.4 | 58-98 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Acenaphthene | 98.5 | 58-98 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Benzo (k) fluoranthene | 120 | 65-110 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Benzo (k) fluoranthene | 114 | 65-110 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Chrysene | 109 | 62-107 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Dibenzofuran | 100 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Dibenzofuran | 96.7 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Fluorene | 105 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Fluorene | 102 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Naphthalene | 99.1 | 58-97 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Naphthalene | 101 | 58-97 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Pentachlorophenol | 121 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Pentachlorophenol | 122 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Phenanthrene | 104 | 57-102 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Phenanthrene | 105 | 57-102 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS1) | Pyrene | 116 | 56-108 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD1) | Pyrene | 110 | 56-108 | SW-846 8270 C | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Benzo (a) anthracene | 109 | 64-108 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Benzo (a) anthracene | 111 | 64-108 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Benzo (a) pyrene | 131 | 71-111 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Benzo (a) pyrene | 131 | 71-111 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS (4F28028-BS2) | Benzo (b) fluoranthene | 119 | 66-110 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Benzo (b) fluoranthene | 127 | 66-110 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Benzo (ghi) perylene | 130 | 56-118 | SW-846 8270 C-SIM | Soil | None[2] |

TABLE 7 (Continued)

| Batch | Sample Identification (Lab ID) | Analyte | Recovery (%) | Recovery Limit (%) | Analytical Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|
| 4F28028 | LCS Dup (4F28028-BSD2) | Benzo (ghi) perylene | 130 | 56-118 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS (4F28028-BS2) | Benzo (k) fluoranthene | 121 | 65-110 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Benzo (k) fluoranthene | 122 | 65-110 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Chrysene | 111 | 62-107 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Chrysene | 112 | 62-107 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Dibenz (a,h) anthracene | 154 | 52-120 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Dibenz (a,h) anthracene | 153 | 52-120 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS (4F28028-BS2) | Fluorene | 112 | 61-99 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Fluorene | 115 | 61-99 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS (4F28028-BS2) | Indeno (1,2,3-cd) pyrene | 145 | 54-121 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Indeno (1,2,3-cd) pyrene | 144 | 54-121 | SW-846 8270 C-SIM | Soil | None[2] |
| 4F28028 | LCS (4F28028-BS2) | Phenanthrene | 106 | 57-102 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F28028 | LCS Dup (4F28028-BSD2) | Phenanthrene | 110 | 57-102 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30017 | LCS (4F30017-BS2) | 2,3,4,5 and 2,3,5,6-Tetrachlorophenols | 32.3 | 50-150 | SW-846 8270 C | Water | Yes |
| 4F30017 | LCS (4F30017-BS2) | 2,4,5-Trichlorophenol | 28.1 | 53-113 | SW-846 8270 C | Water | Yes |
| 4F30017 | LCS (4F30017-BS2) | 2,4,6-Trichlorophenol | 18.6 | 53-113 | SW-846 8270 C | Water | Yes |
| 4F30040 | LCS Dup (4F30040-BSD2) | 2,3,5,6-Tetrachlorophenol | 106 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | 2,4,6-Trichlorophenol | 110 | 58-100 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | 2-Methylnaphthalene | 99.3 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | 2-Methylnaphthalene | 102 | 53-91 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Acenaphthalene | 98.7 | 58-98 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Anthracene | 114 | 56-112 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Benzo (a) pyrene | 113 | 71-111 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Chrysene | 113 | 62-107 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Dibenzofuran | 96.9 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Dibenzofuran | 105 | 60-96 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Fluorene | 99.7 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Fluorene | 108 | 61-99 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Pentachlorophenol | 120 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Pentachlorophenol | 122 | 52-104 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Phenanthrene | 105 | 57-102 | SW-846 8270 C | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Benzo (a) anthracene | 112 | 64-108 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Benzo (a) anthracene | 114 | 64-108 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Benzo (a) pyrene | 114 | 71-111 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Benzo (k) fluoranthene | 121 | 65-110 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Benzo (k) fluoranthene | 127 | 65-110 | SW-846 8270 C-SIM | Soil | None[1] |

# TABLE 7 (Continued)

| Batch | Sample Identification (Lab ID) | Analyte | Recovery (%) | Recovery Limit (%) | Analytical Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|
| 4F30040 | LCS Dup (4F30040-BSD2) | Fluroanthene | 116 | 57-114 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS (4F30040-BS2) | Pentachlorophenol | 116 | 52-104 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Pentachlorophenol | 118 | 52-104 | SW-846 8270 C-SIM | Soil | None[1] |
| 4F30040 | LCS Dup (4F30040-BSD2) | Pyrene | 109 | 56-108 | SW-846 8270 C-SIM | Soil | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Acenaphthalene | 106 | 41-97 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Acenaphthylene | 112 | 44-103 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS (4G01015-BS2) | Anthracene | 107 | 45-104 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Anthracene | 135 | 45-104 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Benzo (a) anthracene | 118 | 50-111 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Benzo (a) pyrene | 130 | 51-119 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS (4G01015-BS2) | Benzo (b) fluoranthene | 118 | 54-114 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Benzo (b) fluoranthene | 135 | 54-114 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Benzo (ghi) perylene | 122 | 44-115 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Chrysene | 124 | 51-108 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Fluoranthene | 129 | 51-112 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Fluorene | 126 | 46-102 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Napthalene | 98.5 | 37-95 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Phenanthrene | 126 | 47-101 | SW-846 8270 C | Water | None[1] |
| 4G01015 | LCS Dup (4G01015-BSD2) | Pyrene | 126 | 45-111 | SW-846 8270 C | Water | None[1] |
| 4G10016 | LCS (4G10016-BS2) | Fluorene | 104 | 46-102 | SW-846 8270 C | Water | None[1] |
| 4G10016 | LCS Dup (4G10016-BSD2) | Pentachlorophenol | 130 | 26-123 | SW-846 8270 C | Water | None[1] |
| 4G10016 | LCS Dup (4G10016-BSD2) | Phenanthrene | 103 | 47-101 | SW-846 8270 C | Water | None[1] |
| 4G25014 | LCS Dup (4G25014-BSD1) | C8-C10 Aliphatics | 38.5 | 70-130 | Ecology EPH | Water | Yes |
| 4G25014 | LCS Dup (4G25014-BSD1) | C8-C10 Aromatics | 54.8 | 70-130 | Ecology EPH | Water | Yes |

Notes:

[1]No action taken. The percent recovery was outside project QC criteria but within laboratory control limits.

[1]No action taken. Results not qualified on non-detect data for elevated recoveries.

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# TABLE 8
# RELATIVE PERCENT DIFFERENCE
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Batch | Sample Identification | Analyte | RPD | RPD Limit | Analytical Method | Matrix | Actions |
|---|---|---|---|---|---|---|---|
| 4F23014 | Matrix Spike Dup (4F23014-MSD1) | Hexavalent Chromium | 37 | 30 | SW-846 7196 | Soil | None1 |
| 4F25014 | LCS Dup (4F25014-BSD1) | C8-C10 Aliphatics | 40.1 | 25 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C10-C12 Aliphatics | 30.2 | 25 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C8-C10 Aliphatics | 40.1 | 25 | Ecology EPH | Water | Yes |
| 4F25014 | LCS Dup (4F25014-BSD1) | C10-C12 Aliphatics | 30.2 | 25 | Ecology EPH | Water | Yes |
| 4F25028 | Matrix Spike Dup (4F25028-MSD1) | 2,3,4,5 and 2,3,5,6-Tetrachlorophenols | 50.2 | 40 | SW-846 8270 C | Soil | Yes |
| 4F25028 | Matrix Spike Dup (4F25028-MSD1) | 2,3,5,6-Tetrachlorophenol | 57.4 | 40 | SW-846 8270 C | Soil | Yes |
| 4F25028 | Matrix Spike Dup (4F25028-MSD1) | Pentachlorophenol | 75.6 | 40 | SW-846 8270 C | Soil | Yes |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | 2,4,6-Trichlorophenol | 49.6 | 40 | SW-846 8270 C | Soil | Yes |
| 4F28028 | Matrix Spike Dup (4F28028-MSD1) | 2,4,6-Trichlorophenol | 49.6 | 40 | SW-846 8270 C | Soil | Yes |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C8-C10 Aromatics | 58.4 | 25 | Ecology EPH | Soil | None2 |
| 4F28030 | Matrix Spike Dup (4F28030-MSD1) | C10-C12 Aromatics | 42.6 | 25 | Ecology EPH | Soil | None2 |
| 4F30017 | LCS Dup (4F30017-BSD2) | Pentachlorophenol | 44.3 | 40 | SW-846 8270 C | Water | None1 |
| 4F30017 | LCS Dup (4F30017-BSD2) | 2,3,4,5 and 2,3,5,6-Tetrachlorophenols | 84.4 | 40 | SW-846 8270 C | Water | None1 |
| 4F30017 | LCS Dup (4F30017-BSD2) | 2,3,5,6-Tetrachlorophenol | 87.5 | 40 | SW-846 8270 C | Water | None1 |
| 4F30017 | LCS Dup (4F30017-BSD2) | 2,4,5-Trichlorophenol | 104 | 40 | SW-846 8270 C | Water | None1 |
| 4F30017 | LCS Dup (4F30017-BSD2) | 2,4,6-Trichlorophenol | 126 | 40 | SW-846 8270 C | Water | None1 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (k) fluoranthene | 65.7 | 40 | SW-846 8270 C | Soil | None1 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Fluoranthene | 41.2 | 40 | SW-846 8270 C | Soil | None3 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Pyrene | 48.1 | 40 | SW-846 8270 C | Soil | None3 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Benzo (k) fluoranthene | 65.7 | 40 | SW-846 8270 C | Soil | None1 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Fluoranthene | 41.2 | 40 | SW-846 8270 C | Soil | None1 |
| 4F30040 | Matrix Spike Dup (4F30040-MSD1) | Pyrene | 48.1 | 40 | SW-846 8270 C | Soil | None1 |
| X299 | Matrix Spike (2689-001-MS) | OCDD | 65.7 | 50 | SW 846 8290 | Soil | None2 |
| X299 | Matrix Spike Dup (2689-001-MSD) | OCDD | 65.7 | 50 | SW 846 8290 | Soil | None2 |

Notes:
[1]No action taken on RPD data alone.
[2]No action taken when the source sample is not from the project site.
[3]No action taken on percent RPD when sample amounts are significantly greater than spike amount.

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# TABLE 9
# CALIBRATION VERIFICATION
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Method | Target Compound | Date/Time | True Value (ng) | Found Value (ng) | Window | | Action |
|---|---|---|---|---|---|---|---|
| | | | | | Lower | Upper | |
| MTCA EPA Calibration Verification | C16-C21 Aliphatics | 8-6-04/21:12 | 600 | **760.85** | 480 | 720 | Yes |
| MTCA EPA Calibration Verification | C16-C21 Aliphatics | 8-7-04/5:58 | 600 | **763.62** | 480 | 720 | Yes |
| MTCA EPA Calibration Verification | C16-C21 Aliphatics | 8-7-04/19:52 | 600 | **763.13** | 480 | 720 | Yes |
| MTCA EPA Calibration Verification | C16-C21 Aliphatics | 8-7-07/22:32 | 600 | **769.94** | 480 | 720 | Yes |
| EPA 8260B Calibration Verification | Chloromethane | 6-25-04/23:02 | 20 | **25.06** | 15 | 25 | None required |

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# TABLE 10
# INITIAL CALIBRATIONS
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Date | Time | Method File | Compound | Avg (RRF) | RRF Limit | %RSD | %RSD Limit | Method | Actions |
|---|---|---|---|---|---|---|---|---|---|
| 06/23/04 | 18:31 | VODF1604.M | Chloroethane | 0.112 | >=0.05 | 31.18 | <=30 | SW-846 8260 | Yes |
| 06/23/04 | 18:31 | VODF1604.M | tert-Butyl methyl | 1.476 | >=0.05 | 82.06 | <=30 | SW-846 8260 | None[1] |
| 06/23/04 | 18:31 | VODF1604.M | Methylene chloride | 2.506 | >=0.05 | 71.47 | <=30 | SW-846 8260 | None[1] |
| 06/23/04 | 18:31 | VODF1604.M | 2,2-Dichloropropane | 0.467 | >=0.05 | 30.84 | <=30 | SW-846 8260 | Yes |
| 06/23/04 | 18:31 | VODF1604.M | cis-1,3 Dichloropropene | 0.504 | >=0.05 | 36.02 | <=30 | SW-846 8260 | None[1] |
| 06/23/04 | 18:31 | VODF1604.M | trans-1,3-Dichloropropene | 0.45 | >=0.05 | 38.58 | <=30 | SW-846 8260 | Yes |
| 06/23/04 | 18:31 | VODF1604.M | 1,2-Dibromo-3-chloropropane | 0.12 | >=0.05 | 41.7 | <=30 | SW-846 8260 | Yes |
| 06/29/04 | 10:14 | FL9F2504.M | Benzoic Acid | 0.108 | >=0.05 | 39.924 | <=30 | SW-846 8270C | None[2] |
| 06/29/04 | 10:14 | FL9F2504.M | 2,4-Dinitrophenol | 0.127 | >=0.05 | 48.342 | <=30 | SW-846 8270C | None[2] |
| 06/29/04 | 7:28 | FL9F2804.M | Benzoic Acid | 0.032 | >=0.05 | 40.39 | <=30 | SW-846 8270C | None[2] |
| 06/29/04 | 7:28 | FL9F2804.M | 2,4-Dinitrophenol | 0.154 | >=0.05 | 31.94 | <=30 | SW-846 8270C | None[2] |
| 06/23/04 | 12:49 | FL92204.M | Benzoic Acid | 0.224 | >=0.05 | 38.26 | <=30 | SW-846 8270C | None[2] |
| 06/29/04 | 10:31 | FL9F2804.M | Benzoic Acid | 0.153 | >=0.05 | 32.71 | <=30 | SW-846 8270C | None[2] |
| 07/06/04 | 17:21 | FL9G0604.M | 1,4-Dichlorobenzene-d4 | 0 | >=0.05 | -1 | <=30 | SW-846 8270C | None[3] |
| 07/06/04 | 17:21 | FL9G0604.M | N-Nitrosodimethylamine | 0 | >=0.05 | -1 | <=30 | SW-846 8270C | None[3] |
| 07/06/04 | 17:21 | FL9G0604.M | Benzoic Acid | 0.132 | >=0.05 | 43.64 | <=30 | SW-846 8270C | None[2] |
| 07/06/04 | 17:21 | FL9G0604.M | 4-Nitrophenol | 0.225 | >=0.05 | 31.759 | <=30 | SW-846 8270C | None[3] |
| 07/06/04 | 17:21 | FL9G0604.M | 2,4-Dinitrophenol | 0.067 | >=0.05 | 49.46 | <=30 | SW-846 8270C | None[2] |
| 07/06/04 | 17:21 | FL9G0604.M | 4,6-Dintro-2-methylph | 0.072 | >=0.05 | 45.78 | <=30 | SW-846 8270C | None[3] |
| 07/06/04 | 17:21 | FL9G0604.M | 1,3,5-Trinitrobenzene | 0.03 | >=0.05 | 38.63 | <=30 | SW-846 8270C | None[3] |
| 07/06/04 | 17:21 | FL9G0604.M | Dinoseb | 0.072 | >=0.05 | 33.14 | <=30 | SW-846 8270C | None[2] |
| 06/22/04 | 7:13 | SIMF2104.M | Pentachlorophenol | 0.031 | >=0.05 | 57.74 | <=30 | 8270C-SIM | Yes |
| 06/22/04 | 7:13 | SIMF2104.M | Pentachlorophenol | 0.025 | >=0.05 | 52.467 | <=30 | 8270C-SIM | Yes |
| 07/14/04 | 8:34 | SIMG1304.M | Pentachlorophenol | 0.056 | >=0.05 | 53.45 | <=30 | 8270C-SIM | Yes |
| 07/15/04 | 11:46 | SIMF1504.M | 2,4,6-TBP | 0.095 | >=0.05 | 31.902 | <=30 | 8270C-SIM | Yes |
| 07/15/04 | 11:46 | SIMF1504.M | Pentachlorophenol | 0.072 | >=0.05 | 35.589 | <=30 | 8270C-SIM | Yes |

Notes:
[1]No action taken because results were non-detects
[2]Not a target analyte
[3]Initial calibrations were re-run and within limits for this batch

# TABLE 11
# CONTINUING CALIBRATION
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Date | Time | Compound | % Recovery (%D) | Acceptance Criteria | Method | Action |
|---|---|---|---|---|---|---|
| 06/29/04 | 7:48 | Benzo (k) fluoroanthene | 126% | 75% to 125% | SW-846 8270C | None[1] |
| 06/29/04 | 17:35 | 4-Nitrophenol | 68% | 75% to 125% | SW-846 8270C | Yes |
| 06/29/04 | 21:12 | Hexachlorocyclopentadiene | 42% | 75% to 125% | SW-846 8270C | None[2] |
| 07/09/04 | 15:24 | Pentachlorophenol | 133% | 75% to 125% | SW-846 8270C | Yes |
| 07/06/04 | 16:56 | Benzo (k) fluoroanthene | 72 | 75% to 125% | SW-846 8270C | None[3] |
| 07/05/04 | 10:52 | Pentachlorophenol | 200 | 75% to 125% | GC/MS PAH SIM | None[1] |
| 06/23/04 | 16:48 | Pyrene | 73 | 75% to 125% | GC/MS PAH SIM | Yes |
| 07/15/04 | | 13C-OCDD | 156 | 40-135 | SW-846 8290 | Yes |

Notes:
[1]Injection logs indicate no project samples were analyzed in this sequence.
[2]Not a target analyte
[3]Results from a different instrument also running this analysis were reported instead.

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# TABLE 12
# INTERNAL STANDARD SUMMARY
FORMER HALEY WOOD TREATING SITE/DNR PROPERTY
BELLINGHAM, WASHINGTON

| Sample ID | Internal Standard # or Compound | Response | Response Upper Limit | Response Lower Limit | Method |
|---|---|---|---|---|---|
| B4F0487-14RE1 | Acenaphthalene | 723073 | 362434 | 90609 | GC/MS PAH SIM |
| B4F0626-54 | IS5 (Chrysene-d12) | 46447 | 281280 | 70320 | GC/MS PAH SIM |
| B4F0626-54 | IS6 (Perylene-d12) | 31770 | 146720 | 36680 | GC/MS PAH SIM |
| B4F0757-02 | Chrysene | 78402 | 315736 | 78934 | GC/MS PAH SIM |
| B4F0757-02 | Perylene-d | 50061 | 206500 | 51625 | GC/MS PAH SIM |
| 4F28028-MS1 | Chrysene | 1952444 | 1839902 | 459976 | SW-846 8270 |
| 4F28028-MS1 | IS5(Chrysene-d12) | 1952444 | 1839902 | 459976 | SW-846 8270 |
| 4F28028-MS1 | IS6(Perylene-d12) | 2160193 | 1690618 | 422655 | SW-846 8270 |
| 4F28028-MS1 | Perylene-d | 2160193 | 1690618 | 422655 | SW-846 8270 |
| 4F28028-MSD1 | Chrysene | 1857887 | 1839902 | 459976 | SW-846 8270 |
| 4F28028-MSD1 | IS5(Chrysene-d12) | 1857887 | 1839902 | 459976 | SW-846 8270 |
| 4F28028-MSD1 | IS6(Perylene-d12) | 2062619 | 1690618 | 422655 | SW-846 8270 |
| 4F28028-MSD1 | Perylene-d | 2062619 | 1690618 | 422655 | SW-846 8270 |
| 4G08008-BS2 | Naphthalene | 269755 | 1097018 | 274255 | SW-846 8270 |
| 4G08008-BSD2 | 1,4-Dichloro | 58578 | 235218 | 58805 | SW-846 8270 |
| 4G08008-BSD2 | Naphthalene | 270399 | 1097018 | 274255 | SW-846 8270 |
| B4F0627-32 | IS6 (Perylene-d12) | 2050120 | 1690618 | 422655 | SW-846 8270 |
| B4F0627-32 | Perylene-d | 2050120 | 1881372 | 470343 | SW-846 8270 |
| B4F0634-04REI | 1,4-Dichloro | 96241 | 755058 | 188765 | SW-846 8270 |
| B4F0634-04REI | Phenanthrene | 518060 | 2553246 | 638312 | SW-846 8270 |
| B4F0701-21 | IS5 (Dichlorobenzene-d4) | 2477109 | 1116808 | 279202 | SW-846 8270 |
| B4F0725-01 | IS3 (Acenapthalene-d10) | 911996 | 602500 | 150625 | SW-846 8270 |
| B4F0725-01 | IS4 (Phenanthrene-d10) | 1086422 | 1018648 | 254662 | SW-846 8270 |
| B4F0725-05 | IS5 (Chrysene-d12) | 1225209 | 971602 | 242901 | SW-846 8270 |
| B4F0725-05 | IS6 (Perylene-d12) | 891180 | 884982 | 221246 | SW-846 8270 |
| B4F0745-03 | 1,4-Dichloro | 359048 | 167134 | 41784 | SW-846 8270 |
| B4F0745-03 | Acenaphthalene | 1954614 | 602500 | 150625 | SW-846 8270 |
| B4F0745-03 | Chrysene | 3801000 | 971602 | 242901 | SW-846 8270 |

TABLE 12 (Continued)

| Sample ID | Internal Standard # or Compound | Response | Response Upper Limit | Response Lower Limit | Method |
|---|---|---|---|---|---|
| B4F0745-03 | Naphthalene | 1244571 | 889358 | 222340 | SW-846 8270 |
| B4F0745-03 | Perylene-d | 3016249 | 884982 | 221246 | SW-846 8270 |
| B4F0745-03 | Phenanthrene | 2450834 | 1018648 | 254662 | SW-846 8270 |
| B4F0745-12 | IS3 (Acenapthalene-d10) | 709604 | 431028 | 107757 | SW-846 8270 |
| B4F0745-13 | IS2 (Napthalene-d8) | 768269 | 673716 | 168429 | SW-846 8270 |
| B4F0745-13 | IS3 (Acenapthalene-d10) | 999164 | 431028 | 107757 | SW-846 8270 |
| B4F0746-14 | Acenaphthalene | 1897003 | 1131106 | 282777 | SW-846 8270 |
| B4F0746-14 | Acenaphthalene | 1897003 | 1354512 | 338628 | SW-846 8270 |
| B4F0746-14 | IS2 (Napthalene-d8) | 2004196 | 1943490 | 485873 | SW-846 8270 |
| B4F0746-14 | IS3 (Acenapthalene-d10) | 1897003 | 1131106 | 282777 | SW-846 8270 |
| B4F0746-14 | IS4 (Phenanthrene-d10) | 2037173 | 1915662 | 478916 | SW-846 8270 |
| B4F0746-14 | IS6 (Perylene-d12) | 1710161 | 1690618 | 422655 | SW-846 8270 |
| B4F0746-14 | Naphthalene | 2004196 | 1943490 | 485873 | SW-846 8270 |
| B4F0746-14 | Perylene-d | 1710161 | 1690618 | 422655 | SW-846 8270 |
| B4F0746-14 | Phenanthrene | 2037173 | 1915662 | 478916 | SW-846 8270 |
| B4F0789-04RE2 | IS2 (Napthalene-d8) | 739859 | 675384 | 168846 | SW-846 8270 |
| B4F0789-04REI | 1,4-Dichloro | 51966 | 235218 | 58805 | SW-846 8270 |
| B4F0789-04REI | Naphthalene | 251114 | 1097018 | 274255 | SW-846 8270 |
| B4F0789-06RE2 | IS3(Acenapthalene-d10) | 587789 | 416280 | 104070 | SW-846 8270 |

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# TABLE 13
# GROUND WATER FIELD PARAMETERS
## GROUND WATER MONITORING

| | Parameter | | | |
|---|---|---|---|---|
| Monitoring Well | pH | Temperature (degrees C) | Electrical Conductivity (µmho/cm) | Turbidity (NTU) |
| CL-MW-1D | 7.1 | 14.2 | 24 | 5.6 |
| CL-MW-6 | 7.3 | 12.2 | 52 | 125.2 |
| CL-MW-7 | 6.7 | 14.3 | 0.12 | 24.4 |
| CL-MW-14 | 7.3 | 12.0 | 76 | 7.8 |
| CL-MW-15 | 6.7 | 12.0 | 34 | 657.0 |
| HS-MW-4 | 6.9 | 13.9 | 0.10 | 7.2 |
| HS-MW-5 | 8.2 | 13.6 | 60 | 10.2 |
| HS-MW-6 | 6.9 | 13.5 | 55 | 0.0 |
| HS-MW-9 | 7.0 | 13.3 | 0.09 | 6.3 |
| HS-MW-10 | 7.1 | 14.0 | 21 | 782.0 |
| HS-MW-11 | 6.6 | 13.9 | 54 | 10.8 |
| HS-MW-13 | 6.7 | 13.3 | 0.11 | 109.0 |
| HS-MW-15 | 6.8 | 11.5 | 2.1 | 329.0 |
| IZ-MW-1 | 6.7 | 10.5 | 1.7 | 58.2 |
| IZ-MW-2 | 7.0 | 11.1 | 2.1 | 25.4 |
| IZ-MW-3 | 7.7 | 9.0 | 2.7 | 720.0 |
| TL-MW-4 | 7.0 | 11.0 | 0.18 | 85.7 |
| TL-MW-9 | 7.0 | 11.6 | 0.78 | 16.5 |
| TL-MW-10 | 6.8 | 13.1 | 2.1 | 2.0 |
| TL-MW-11 | 6.6 | 12.8 | 73 | 152.4 |

Notes:
Samples collected June 2004

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GeoEngineers

# APPENDIX A
## ECOCHEM, INC., DATA VALIDATION REPORT (DECEMBER 2004 AND MARCH/APRIL/2005 GROUNDWATER SAMPLING EVENT

# EcoChem, Inc.



Environmental Science and Chemistry

## TRANSMITTAL

**DATE:** August 19, 2005

**PROJECT NO.:** 2206-1

**TO:** Jay Lucas
Geo Engineers - Seattle
600 Stewart St. Suite 1420
Seattle, Washington 98101
206-728-2674

**FROM:** Chris Ransom
EcoChem, Inc.
100 South King Street
Suite 405
Seattle, WA 98104

**VIA: U.S. Mail**

**WE ARE SENDING THE FOLLOWING MATERIALS:**

- Data validation report for R.G. Haley Site, SDGs B4l0235 and B5D0048.

**REMARKS:**

Please call me if you have any questions.

Sincerely,

Chris Ransom
Project Manager
**EcoChem, Inc.**

**Copies:** Chron
Project File

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EcoChem, Inc.

Environmental Science and Chemistry

# DATA VALIDATION REPORT

## R.G. HALEY SITE

## SDGs: B4I0235 and B5D0048

**Prepared for:**

Geo Engineers – Seattle
600 Stewart St. Suite ~~1420~~ 1700
Seattle, Washington 98101

**Prepared by:**

EcoChem, Inc.
405 Westland Building
100 South King Street
Seattle, Washington 98104-2885

EcoChem Project: C2206-1

August 18, 2005

**Approved for Release:**

Christine Ransom
Project Manager
**EcoChem, Inc.**

# PROJECT NARRATIVE

### *Basis for the Data Validation*

This report summarizes the results of the validation performed on forty-two water samples. The **SAMPLE INDEX** lists all samples reviewed.

North Creek Analytical Laboratories, Bothell, Washington analyzed the samples for semivolatile compounds and diesel range organic compounds (including lube oils). Frontier Analytical Laboratory, El Dorado Hills, California analyzed the samples for dioxin/furan compounds. The analytical methods and EcoChem project chemists are listed in the table below.

**ANALYSIS METHODS AND ECOCHEM CHEMISTS**

| Analysis | Method | Primary Review | Secondary Review |
|---|---|---|---|
| Semivolatile Organic Compounds (SVOC) | SW8270 | Eric Strout | Christine Ransom |
| Dioxin/Furan Compounds | SW 8290 | Craig Hutchings | Eric Strout |
| Diesel Range Organic Compounds & Lube Oil | NWTPH Dx | Craig Hutchings | Christine Ransom |

The data were reviewed using guidance and quality control criteria documented in the analytical methods, the quality assurance project plan (QAPP) and the *National Functional Guidelines for Organic Data Review* (USEPA 1999).

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A** **APPENDIX B** contains the Qualified Data Summary Table. Data validation worksheets will be kept on file at EcoChem.

# SAMPLE INDEX
## R.G. Haley Site
## March 2005 Sampling Event



| Client ID | Laboratory ID | SVOC | Dioxins | NWTPH-Dx |
|---|---|---|---|---|
| HS-MW-4-040105 | B5D0048-01 | X | | X |
| HS-MW-5-033105 | B5D0048-02 | X | | X |
| HS-MW-6-033105 | B5D0048-03 | X | | X |
| HS-MW-9-033105 | B5D0048-04 | X | | X |
| HS-MW-10-033105 | B5D0048-05 | X | | X |
| HS-MW-11-040105 | B5D0048-06 | X | | X |
| HS-MW-13-040105 | B5D0048-07 | X | | X |
| HS-MW-15-033105 | B5D0048-08 | X | | X |
| D033105 | B5D0048-09 | X | | X |
| TL-MW-9-033105 | B5D0048-10 | X | | X |
| TL-MW-10-040105 | B5D0048-11 | X | | X |
| TL-MW-11-033105 | B5D0048-12 | X | | X |
| 1Z-MW-1-033005 | B5D0048-13 | X | | X |
| 1Z-MW-2-033005 | B5D0048-14 | X | | X |
| 1Z-MW-3-033005 | B5D0048-15 | X | X | X |
| 1Z-MW-4-033005 | B5D0048-16 | X | | X |
| CL-MW-1S-033105 | B5D0048-17 | X | | X |
| CL-MW-1D-033105 | B5D0048-18 | X | | X |
| CL-MW-1H-033105 | B5D0048-19 | X | | X |
| CL-MW-6-033105 | B5D0048-20 | X | | X |
| CL-MW-7-033105 | B5D0048-21 | X | | X |

# SAMPLE INDEX
## R.G. Haley Site
## December 2004 Sampling Event



| Client ID | Laboratory ID | SVOC | Dioxins | NWTPH-Dx |
|---|---|---|---|---|
| CL-MW-1D-120904 | B4L0235-01 | X | | X |
| CL-MW-1H-120904 | B4L0235-02 | X | | X |
| CL-MW-1S-120904 | B4L0235-03 | X | | X |
| CL-MW-6-120904 | B4L0235-04 | X | | X |
| CL-MW-7-120904 | B4L0235-05 | X | | X |
| D120904 | B4L0235-06 | X | | X |
| HS-MW-10-120904 | B4L0235-07 | X | | X |
| HS-MW-11-120904 | B4L0235-08 | X | | X |
| HS-MW-13-120904 | B4L0235-09 | X | | X |
| HS-MW-15-120804 | B4L0235-10 | X | | X |
| HS-MW-4-120904 | B4L0235-11 | X | | X |
| HS-MW-5-120904 | B4L0235-12 | X | | X |
| HS-MW-6-121004 | B4L0235-13 | X | | X |
| HS-MW-9-120904 | B4L0235-14 | X | | X |
| IZ-MW-1-120904 | B4L0235-15 | X | | X |
| IZ-MW-2-120904 | B4L0235-16 | X | | X |
| IZ-MW-3-120904 | B4L0235-17 | X | X | X |
| IZ-MW-4-120904 | B4L0235-18 | X | | X |
| TL-MW-10-120904 | B4L0235-19 | X | | X |
| TL-MW-11-120804 | B4L0235-20 | X | | X |
| TL-MW-9-120904 | B4L0235-21 | X | | X |

# DATA VALIDATION REPORT
# R.G. Haley Site
# Semivolatile Organic Compounds
# EPA Method SW8270C
# SDGs: B4L0235 and B5D0048

This report documents the review of analytical data from the analyses of water samples and the associated laboratory quality control samples. North Creek Analytical, Bothell, Washington, analyzed the samples. Refer to the **SAMPLE INDEX** for a list of the individual samples.

## I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

***SDG B4L0235:*** The laboratory appended the date sampled to all sample identifications. For example, the chain of custody (COC) lists Sample CL-MW-1S and the laboratory reported this sample as CL-MW-1S-120904. No action was taken other than to note this discrepancy.

## II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| | Holding Times and Sample Receipt | | Laboratory Control Samples (LCS/LCSD) |
| | GC/MS Instrument Performance Check | 2 | Field Duplicates |
| | Initial Calibration (ICAL) | 2 | Internal Standards |
| 2 | Continuing Calibration (CCAL) | | Compound Identification |
| | Laboratory Blanks | 1 | Calculation Verification |
| 2 | Surrogate Compounds | | Reporting Limits |
| 1 | Matrix Spikes/Matrix Spike Duplicates (MS/MSD) | 1 | Target Analyte List |

[1] *Quality control results are discussed below, but no data were qualified.*
[2] *Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.*

### Continuing Calibration (CCAL)

The relative response factor (RRF) values were greater than the 0.05 minimum control limit, with the exception noted below. The percent difference (%D) values were within the ±25% control limit for all continuing calibrations (CCAL), with the exceptions noted below. If the %D outlier indicates a potential high bias, associated positive results were estimated (J-5B). If the %D value indicates a potential low bias, associated positive results and reporting limits were estimated (J/UJ-5B). Positive results associated with an RRF value outlier are estimated (J-5B). Due to the potential significant low bias, reporting limits associated with an RRF value outlier are rejected (R-5B). Outliers are detailed in the validation worksheets.

***SDG B4L0235:***

- 12/14/04 00:57: n-nitrosodiphenylamine (low response)
- 12/14/04 13:07: pentachlorophenol (high response)
- 12/21/04: pentachlorophenol (low response and RRF value outlier)
- 12/22/04: n-nitrosodiphenylamine (low response) and pentachlorophenol (low response and RRF value outlier)
- 1/05/05: pentachlorophenol (high response)

***SDG B5D0048:***

- 4/11/05: 2,4,6-trichlorophenol (low response)
- 4/13/05: 2,3,5,6-tetrachlorophenol (high response)
- 4/14/05: pentachlorophenol (high response)
- 4/18/05: pentachlorophenol (low response and RRF value outlier)
- 4/19/05: n-nitrosodiphenylamine (low response) and pentachlorophenol (high response)
- 4/20/05: n-nitrosodiphenylamine (low response) and pentachlorophenol (high response)

## Surrogate Compounds

***SDG B4L0235:*** Although most samples were analyzed multiple times (due to the need for dilutions or to verify QC outliers), only surrogates from one analysis per sample were summarized. For all other analyses, only the on-column concentration in the raw data were reported. In some cases, all target analytes were reported from one analysis and all surrogates were reported from a second analysis.

Surrogate recovery values were reviewed/recalculated from the raw data. For many of the samples, multiple surrogate outliers were associated with the reported target analyte results. Almost all surrogate outliers indicated a potential high bias. For analyses with more than one surrogate recovery value outlier in a fraction (acid or base-neutral), the associated positive results were estimated (J-13).

***SDG B5D0048:*** One or more surrogate percent recovery (%R) values were outside the control limits in eleven of the twenty samples. Most of the samples in this batch were reanalyzed as dilutions. For all of the samples, either the surrogates were acceptable in one of the analyses, or only one surrogate in a fraction (acid or base-neutral) was outside the control limits. No action was taken based on surrogate recovery outliers.

## Matrix Spike/Matrix Spike Duplicate Analyses (MS/MSD)

***SDG B5D0048:*** Two MS/MSD sets were submitted, one using Sample HS-MW-5-003105 and one using a 1:10 dilution of the same sample.

In the MSD analysis from the undiluted sample, the %R values for n-nitrosodiphenylamine (69.8%) and 2,4,6-tri-chlorophenol (54.5%) were less than the lower control limits of 70% and 57%, respectively. As the %R values were acceptable in the MS and LCS/LCSD, no action was taken.

For the MS/MSD set performed using the 1:10 dilution of Sample HS-MW-5-033105, five %R values were less than the lower control limits in the MS analysis, and most relative percent difference (RPD) values were greater than the control limit. A note on the raw data and in the case narrative states that the MS extract was spilled during the solvent-reduction stage of the preparation process. As the %R values were acceptable in the MSD and in the other MS/MSD set, no action was taken.

## Field Duplicates

RPD values were calculated for all compounds with concentrations greater than four times the reporting limit. For compounds with concentrations less than four times the reporting limit, the difference between the reported concentrations was calculated. The results were compared to control limits of 30% for the RPD values, or difference values less than twice the reporting limit.

***SDG B4L0235:*** Samples TL-MW-9-120904 and D120904 were submitted as field duplicates. All RPD values were less than the control limit of 30%.

***SDG B5D0048:*** Samples HW-MW-6-033105 and D033105 were submitted as field duplicates. The RPD values and/or difference values were outside the control limits for fourteen of the twenty-four compounds. Since the majority of the precision results were outside the control limits, all results in these samples were estimated (J/UJ-9).

## Internal Standards

***SDG B4L0235:*** For many of the samples (including reanalyses), the internal standard areas were outside the control limits (–50%/+100% of the area of the internal standard in the associated CCAL). Most of the outliers were less than the lower control limit, indicating a potential low bias.

For internal standard outliers, the associated target compounds were estimated (J/UJ-19). If the target compound was reported from a reanalysis with acceptable internal standard areas, no qualifiers were issued.

## Compound Quantitation and Reporting Limits

***SDG B4L0235:*** Although most samples were analyzed multiple times (due to the need for dilutions or to verify QC outliers), only the 'best' result for each analyte was reported on the sample result summary forms. No action was necessary.

***SDG B5D0048:*** Due to the presence of high levels of target analytes and/or surrogate outliers, most of the samples were analyzed more than once, usually at a higher dilution level. The laboratory reported multiple sets of results for most of the samples.

Target analytes that were present at concentrations greater than the upper calibration range of the instrument were qualified as do-not-report (DNR-20), and should be reported from the appropriate dilution. All of the results from the dilutions, except the target analytes of interest, were qualified as do-not-report (DNR-11) and should be reported from the analysis with the lowest possible dilution.

After the DNR qualifiers were issued, only one result is reported for each compound in a sample. The compounds are reported from the most appropriate analysis.

### Calculation Verification

Several results were verified by recalculation from the raw data. The following errors were noted:

The laboratory incorrectly reported the %D values for all CCAL. The reported %D values were calculated using the concentrations, rather than the RRF values. The correct %D values were reported in the raw data, and were used to evaluate the sample results. No further action was taken, other than to note this discrepancy.

### Target Analyte List

The reported target analyte list includes three compounds that were not part of the target analyte list specified in the quality assurance program plan (QAPP): dibenz(a,h)anthracene, 2,3,4,5/2,3,4,6-tetrachlorophenol, and 2,4,5-trichlorophenol. No action was taken, other than to note the discrepancy.

## III. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Precision was acceptable, as demonstrated by the field duplicate, LCS/LCSD, and MS/MSD RPD values, with the exceptions noted above. Accuracy was also acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD recovery values, with the previously noted exceptions.

Data were estimated due to surrogate recovery outliers, field duplicate precision outliers, internal standard area outliers, and continuing calibration %D outliers. Data were rejected due to a continuing calibration RRF value less than 0.05. Data were qualified as do-not-report in order to indicate which values should be used when multiple results were reported for a sample.

Data that have been rejected or qualified as do-not-report should not be used for any purpose.

All other data, as qualified, are acceptable for use.

# DATA VALIDATION REPORT
# R.G. Haley Site
# Dioxin/Furan Compounds
# EPA Method SW 8290
# SDGs: B4L0235 and B5D0048

This report documents the review of analytical data from the analyses of water samples and the associated laboratory quality control samples. Frontier Analytical Laboratory, El Dorado Hills, California, analyzed the samples. Refer to the **SAMPLE INDEX** for a list of the individual samples.

## I. DATA PACKAGE COMPLETENESS

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative.

## II. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| 1 | Holding Times and Sample Receipt | | Laboratory Blanks |
| | GC/MS Instrument Performance Check | | Labeled Compound Recovery |
| | Initial Calibration (ICAL) | | Ongoing Precision Recovery (OPR) |
| | Continuing Verification (CVER) | | Compound Identification |
| | Isomer Specificity | 2 | Compound Quantitation and Reporting Limits |

[1] *Quality control results are discussed below, but no data were qualified.*
[2] *Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.*

### Holding Times and Sample Receipt

***SDG B5D0048:*** The sample cooler was received outside the control limits of 4°C ±2°, at 0°C. This temperature outlier was judged to have no impact on the data and no action was taken.

### Compound Quantitation and Reporting Limits

***SDG B4L0235:*** The laboratory observed diphenyl ether interference in the determination of the total tetrafurans and total pentafurans. As this interference may result in false positive results, the values for these homologue groups were qualified as not detected (U-21).

***SDG B5D0048:*** The laboratory observed diphenyl ether interference in the determination of 1,2,3,4,6,7,8-HpCDF, total tetrafurans, total pentafurans, total hexafurans, and total heptafurans. As

this interference may result in false positive results, the values for these homologue groups or target analytes were qualified as not detected (U-21).

## Overall Assessment

As determined by this evaluation, the laboratory followed the specified method. Laboratory accuracy was acceptable as demonstrated by the recovery values for the ongoing precision and recovery (OPR) samples and labeled compounds. Laboratory precision could not be evaluated.

Data were qualified as not detected due to diphenyl ether interferences.

All data, as qualified, are acceptable for use.

# DATA VALIDATION REPORT
# R.G. Haley Site
# Diesel Range Organic Compounds & Lube Oil
# Method NWTPH-Dx
# SDGs: B4L0235 and B5D0048

This report documents the review of analytical data from the analyses of water samples and the associated laboratory quality control samples. North Creek Analytical, Bothell, Washington, analyzed the samples. Refer to the **SAMPLE INDEX** for a list of the individual samples.

## I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

***SDG B4L0235:*** The laboratory appended the date sampled to all sample identifications. For example, the chain of custody (COC) lists Sample CL-MW-1S and the laboratory reported this sample as CL-MW-1S-120904. No action was taken other than to note this discrepancy.

## II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| | Technical Holding Times and Sample Receipt | 1 | Matrix Spikes/Matrix Spike Duplicates (MS/MSD) |
| | Initial Calibration (ICAL) | 2 | Laboratory Control Samples (LCS) |
| 1 | Continuing Calibration (CCAL) | 1 | Field Duplicates |
| | Blanks (Method & Field) | 2 | Compound Quantitation and Reporting Limits |
| 1 | Surrogate Compounds | 1 | Calculation Verification |

[1] *Quality control results are discussed below, but no data were qualified.*
[2] *Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.*

### Continuing Calibration (CCAL)

***SDG B5D0048:*** The percent difference (%D) value for the diesel range hydrocarbons CCAL analyzed April 13, 2005 on Instrument GC-1F was outside the ±15% control limit, at -51.6%. The data from the sample associated with this CCAL was not reported and no action was taken.

### Surrogate Compounds

***SDG B5D0048:*** Due to the dilution factors, the surrogates were not recovered in Samples TL-MW-10-040105 (100X) and CL-MW-15-033105 (40X). No action was taken. The percent recovery (%R) value for the 2-FBP surrogate was less than the 50% lower control limit in the method

blank associated with batch 5D09003. Qualifiers are not assigned to QC samples and therefore no action was taken.

## Matrix Spike/Matrix Spike Duplicate Analyses

***SDG B4L0235:*** No matrix spike/matrix spike duplicate (MS/MSD) was analyzed for the lube oil range. As the diesel range MS/MSD were acceptable, no action was taken.

## Laboratory Control Samples

***SDG B4L0235:*** No laboratory control samples (LCS) were analyzed for the lube oil range with the initial extractions. As the diesel range LCS were acceptable no action was taken on this basis. Both lube oil and diesel range LCS were analyzed with the re-extractions and all %R and relative percent difference (RPD) values were acceptable.

***SDG B5D0048:*** The %R value for diesel in the LCS associated with batch 5D04065 was less than the lower control limit of 50%, at 18.7%. The RPD value for diesel was greater than the control limit of 50%, at 125%, for this LCS/LCSD pair. The laboratory noted that these outliers were the result of an error that occurred during the extraction process. The %R value in the LCSD was acceptable. Only Sample CL-MW-7-033105 was associated with this batch; and this sample was re-extracted and re-analyzed with an acceptable LCS/LCSD.

## Field Duplicates

***SDG B4L0235:*** Samples TL-MW-9-120904 and D120904 were submitted as field duplicates. All RPD values were less than the control limit of 30%.

***SDG B5D0048:*** Samples HW-MW-6-033105 and D033105 were submitted as field duplicates. All RPD values were less than the control limit of 30%.

## Compound Quantitation and Reporting Limits

The target reporting limit of 0.25 mg/L for the lube oil range was not met; the laboratory reporting limit was 0.50 mg/L. No action was taken on this basis.

***SDG B4L0235:*** No lube oil range QC was extracted with the samples. At the clients request, the laboratory re-extracted two of the samples, one of which had no positive values (IZ-MW-1-120904) and one with positive values (CL-MW-1S-120904). The re-extraction results for Sample IZ-MW-1-120904 were comparable, however those for Sample CL-MW-1S-120904 were not.

Sample CL-MW-1S-120904 was extracted a third time. Both extractions of Sample IZ-MW-1-120904 were reported, and the first and third extraction of Sample CL-MW-1S-120904 were reported. In order that only one set of values for each sample be reported the initial results should be used for these samples. The re-extraction results for these samples were qualified do-not-report (DNR-11) in

order to indicate that these results should not be used.

***SDG B5D0048:*** The %R value for the diesel range hydrocarbons LCS associated with Sample CL-MW-7-033105 was less than the lower control limit due to a laboratory error. This sample was re-extracted (with diesel range hydrocarbons QC only) and re-analyzed. The LCS/LCSD values for the re-extraction were acceptable.

One of the CCAL for diesel range hydrocarbons associated with the re-analysis did not meet the acceptance criteria, indicating a low bias. The laboratory reported both the initial and the re-analysis. The majority of the QC associated with the initial extraction was acceptable, and the LCS outlier does not indicate any systemic bias. However, the CCAL associated with the re-analysis data indicates a low bias. For these reasons the data from the initial extraction should be used. The data from the re-analysis was qualified as do-not-report (DNR-11) to indicate this.

### Calculation Verification

***SDG B5D0048:*** The laboratory incorrectly reported the %D value and the concentration for the lube oil range hydrocarbons CCAL analyzed April 8, 2005 on Instrument GC-7R, indicating the CCAL did not meet the acceptance criteria. The raw data indicated the correct concentration and the CCAL did meet the acceptance criteria. No action was taken, other than to note this discrepancy.

## III. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Precision was acceptable, as demonstrated by the field duplicate, LCS/LCSD, and MS/MSD RPD values, with the exception noted above. Accuracy was also acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD recovery values, with the exceptions noted above.

Data were estimated due to an LCS %R outlier. Data were qualified as do-not-report in order to indicate which values should be used when multiple results were reported for a sample.

Data that have been qualified as do-not-report should not be used for any purpose.

All other data, as qualified, are acceptable for use.

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# APPENDIX A

# DATA QUALIFIER DEFINITIONS AND VALIDATION CRITERIA

# DATA VALIDATION QUALIFIER CODES
## National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

| | |
|---|---|
| U | The analyte was analyzed for, but was not detected above the reported sample quantitation limit. |
| J | The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. |
| N | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification". |
| NJ | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration. |
| UJ | The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. |
| R | The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. |

The following is an EcoChem qualifier that may also be assigned during the data review process:

| | |
|---|---|
| DNR | Do not report; a more appropriate result is reported from another analysis or dilution. |

# DATA QUALIFIER REASON CODES

| | |
|---|---|
| 1 | Holding Time/Sample Preservation |
| 2 | Chromatographic pattern in sample does not match pattern of calibration standard. |
| 3 | Compound Confirmation |
| 4 | Tentatively Identified Compound (TIC) (associated with NJ only) |
| 5A | Calibration (initial) |
| 5B | Calibration (continuing) |
| 6 | Field Blank Contamination |
| 7 | Lab Blank Contamination (e.g., method blank, instrument, etc.) |
| 8 | Matrix Spike(MS & MSD) Recoveries |
| 9 | Precision (all replicates) |
| 10 | Laboratory Control Sample Recoveries |
| 11 | A more appropriate result is reported (associated with "R" and "DNR" only) |
| 12 | Reference Material |
| 13 | Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards) |
| 14 | Other (define in validation report) |
| 15 | GFAA Post Digestion Spike Recoveries |
| 16 | ICP Serial Dilution % Difference |
| 17 | ICP Interference Check Standard Recovery |
| 18 | Trip Blank Contamination |
| 19 | Internal Standard Performance (e.g., area, retention time, recovery) |
| 20 | Linear Range Exceeded |
| 21 | Potential False Positives |

# EcoChem Validation Guidelines (Based on Organic NFG 1999)
# Semivolatile Analysis by GC/MS

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | 4°C ±2° | J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ) | 1 |
| Holding Time | Water: 7 days from collection<br>Soil: 14 days from collection<br>Analysis: 40 days from extraction | Water:<br>J(+)/UJ(-) if ext. > 7 and < 21 days<br>J(+)/R(-) if ext > 21 days (EcoChem PJ)<br>Solids/Wastes:<br>J(+)/UJ(-) if ext. > 14 and < 42 days<br>J(+)/R(-) if ext. > 42 days (EcoChem PJ)<br><br>J(+)/UJ(-) if analysis >40 days | 1 |
| Tuning | DFTPP<br>Beginning of each 12 hour period<br>Method acceptance criteria | R(+/-) all analytes in all samples associated with the tune | 5A |
| Initial Calibration (Minimum 5 stds.) | RRF > 0.05 | (EcoChem PJ, see TM-06)<br>If MDL= reporting limit:<br>J(+)/R(-) if RRF < 0.05<br><br>If reporting limit > MDL:<br>note in worksheet if RRF <0.05 | 5A |
| | %RSD < 30% | (EcoChem PJ, see TM-06)<br>J(+) if %RSD > 30% | 5A |
| Continuing Calibration (Prior to each 12 hr. shift) | RRF > 0.05 | (EcoChem PJ, see TM-06)<br>If MDL= reporting limit:<br>J(+)/R(-) if RRF < 0.05<br><br>If reporting limit > MDL:<br>note in worksheet if RRF <0.05 | 5B |
| | %D <25% | (EcoChem PJ, see TM-06)<br>If > +/-90%: J+/R-<br>If -90% to -26%: J+ (high bias)<br>If 26% to 90%: J+/UJ- (low bias) | 5B |
| Method Blank | One per matrix per batch<br>No results > CRQL | U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL) | 7 |
| | | U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value) | 7 |
| | No TICs present | R(+) TICs using 10X rule | 7 |
| Field Blanks (Not Required) | No results > CRQL | Apply 5X/10X rule; U(+) < action level | 6 |

# EcoChem Validation Guidelines (Based on Organic NFG 1999)
# Semivolatile Analysis by GC/MS

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| MS/MSD (recovery) | One per matrix per batch<br>Use method acceptance criteria | Qualify parent only unless other QC indicates systematic problems:<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>J(+)/R(-) if both %R < 10%<br>**PJ if only one %R outlier** | 8 |
| MS/MSD (RPD) | One per matrix per batch<br>Use method acceptance criteria | J(+) if RPD > CL | 9 |
| LCS<br>**low conc. H2O SVOA** | One per lab batch<br>Within method control limits | J(+) assoc. cmpd if > UCL<br>J(+)/R(-) assoc. cmpd if < LCL<br>J(+)/R(-) all cmpds if half are < LCL | 10 |
| LCS<br>**regular SVOA (H2O & solid)** | One per lab batch<br>Lab or method control limits | J(+) if %R > UCL J(+)/UJ(-) if %R <LCL<br>J(+)/R(-) if %R < 10% **(EcoChem PJ)** | 10 |
| LCS/LCSD<br>*(if required)* | One set per matrix and batch of 20 samples<br>RPD < 35% | J(+)/UJ(-) assoc. cmpd. in all samples | 9 |
| Surrogates | Minimum of 3 acid and 3 base/neutral compounds<br>Use method acceptance criteria | Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10%<br>J(+) if %R > UCL J(+)/UJ(-) if %R < LCL<br>J(+)/R(-) if %R < 10% | 13 |
| Internal Standards | IS area within -50% to 100% of CC<br>RT within 30 seconds of CC RT | J(+) if IS > 100%<br>J(+)/UJ(-) if IS < 50%<br>J(+)/R(-) if IS is < 25%<br>RT>30 seconds, **narrate and Notify PM** | 19 |
| Field Duplicates | Use QAPP limits<br>if no QAPP: Use RPD < 35% (water) or < 50% (soil) | Narrate and qualify if required by project<br>**(EcoChem PJ)** | 9 |
| TICs | Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification | R(+) common laboratory contaminants<br>R(+) target compouds from other fractions<br>**See Technical Director for ID issues** | 4 |
| Quantitation/ Identification | RRT within 0.06 of standard RRT<br>Ion relative intensity within 20% of standard<br>All ions in std. at > 10% intensity must be present in sample | **See Technical Director if outliers** | 14<br>21 (false +) |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | Waters/Solids <4°C<br>Tissues <10°C | EcoChem PJ, see TM-05 | 1 |
| Holding Time | Water: 30 days from collection<br>Soil: 30 days from collection<br>Analysis: 40 days from extraction<br>Note: Under CWA, SDWA, and RCRA the HT for H2O is 7 days | J(+)/UJ(-) if ext > 30days<br>J(+)/UJ(-) if analysis > 40 Days<br>EcoChem PJ, see TM-05 | 1 |
| Mass Resolution | >=10,000 resolving power at m/z 304.9824<br>Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) .<br>Analyzed prior to ICAL and at the start and end of each 12 hr. shift | R(+/-) if not met | 14 |
| Window Defining Mix and Column Performance Mix | Window defining mixture/isomer specificity std run before ICAL and CCAL<br>Valley < 25% (valley = (x/y)*100%)<br>x = ht. of TCDD<br>y = baseline to bottom of valley<br>For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290) | J(+) if valley > 25% | 5A (ICAL)<br>5B (CCAL |
| Initial Calibration | ICAL: Minimum of five standards<br>%RSD < 20% for native compounds<br>%RSD <30% for labeled compounds<br>(%RSD <35% for labeled compounds under 1613b) | J(+) natives if %RSD > 20% | 5A |
| | Abs. RT of $^{13}C_{12}$-1234-TCDD<br>>25 min on DB5<br>>15 min on DB-225 | EcoChem PJ, see TM-05 | |
| | Ion Abundance ratios within QC limits<br>(Table 8 of method 8290)<br>(Table 9 of method 1613B) | EcoChem PJ, see TM-05 | |
| | S/N ratio > 10 for all native and labeled compounds in CS1 std. | If <10, elevate Det. Limit or R(-) | |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Continuing Calibration | Analyzed at the start and end of each 12 hour shift.<br>%D+/-20% for native compounds<br>%D +/-30% for labeled compounds<br>(Must meet limits in Table 6 for 1613B)<br>(If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the 2 CCAL may be used to calculate samples per Section 8.3.2.4 of 8290) | J(+)/UJ(-) natives if %D = 30% - 75%<br>R(+/-) if %D > 75% | 5B |
| | Abs. RT of $^{13}C_{12}$-1234-TCDD and $^{13}$C12-123789-HxCDD +/- 15 sec of ICAL. | EcoChem PJ, see ICAL section of TM-05 | |
| | RRT of all other compounds must meet table 2 of 1613B. | EcoChem PJ, see TM-05 | |
| | Ion Abundance ratios within QC limits<br>(Table 8 of method 8290)<br>(Table 9 of method 1613B) | EcoChem PJ, see TM-05 | |
| | S/N ratio > 10 | EcoChem PJ, see ICAL section of TM-05 | |
| Method Blank | One per matrix per batch<br>No positive results | If sample result <5X action level, qualify U at reported value. | 7 |
| Field Blanks (Not Required) | No positive results | If sample result <5X action level, qualify U at reported value. | 6 |
| LCS / OPR | Concentrations must meet limits in Table 6 of method 1613B or lab limits. | J(+) if %R > UCL<br>J(+)/UJ(-) if %R < LCL<br>J(+)/R(-) using PJ if %R <<LCL (< 10%) | 10 |
| MS/MSD (recovery) | May not analyze MS/MSD<br>%R should meet lab limits. | Qualify parent only unless other QC indicates systematic problems:<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>J(+)/R(-) if both %R < 10%<br>PJ if only one %R outlier | 8 |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| MS/MSD (RPD) | May not analyze MS/MSD<br>RPD < 20% | J(+) if RPD > CL | 9 |
| Lab Duplicate | RPD <25% if present. | J(+)/UJ(-) if outside limts | 9 |
| Labeled Compounds / Internal Standards | *Method 8290:* %R = 40% - 135% in all samples<br>---<br>*Method 1613B:* %R must meet limits specified inTable 7 | J(+)/UJ(-) if %R = 10% - LCL<br>J(+) if %R > UCL<br>J(+)/R(-) if %R < 10% | 13 |
| Quantitation/ Identification | SIM ions for analyte, Istd, rec. std. Max w/in 2 sec.<br>S/N >2.5<br>IA ratios meet limits in Table 9 of 1613B or Table 8 of 8290<br>RRTs w/in limits in table 2 of 1613B | If RT criteria not met, use PJ (see TM-05)<br>If S/N criteria not met, J(+).<br>if unlabelled ion abundance not met, change to EMPC<br>If labelled ion abundance not met, J(+). | 21 |
| EMPC (estimated maximum possible concentration) | If quantitation idenfication criteria are not met, laboratory should report an EMPC value. | If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit. | 14 |
| Interferences | PCDF interferences from PCDPE | If both detected, change PCDF result to EMPC | 14 |
| Second Column Confirmation | All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis. | Report lower of the two values.<br>If not performed use PJ (see TM-05). | 3 |
| Field Duplicates | Water: RPD < 35%<br>Soil: RPD < 50% | Note in Narrative and use Professional Judgement to qualify | 9 |
| Two analyses for one sample | Report only one result per analyte | "DNR" results that should not be used | 11 |

# State of Washington (and Oregon)
# Total Petroleum Hydrocarbons-Diesel (and Residual) Range

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | 4°C±2°C | J(+)/UJ(-) using Professional Judgement | 2 |
| Holding Time | Water: 14 days from collection (if acidified); 7 days (if unacidified)<br>Soil: 14 days from collection<br>Analysis: 40 days from extraction | J(+)/UJ(-) if ext/analyzed > HT<br>J(+)/R(-) if ext/analyzed > 3X HT (Prof. Judgement) | 1 |
| Retention Time Standards (RTS) | RTS run every 24 hours or at the beginning of each analytical shift (C10 and C24) | Narrate (Use Professional Judgement to qualify) | 5B |
| Initial Calibration | 5 calibration points (All within 15%)<br>Linear Regression: $R^2 \geq 0.990$ | J(+)/UJ(-)<br>If $R^2 < 0.990$ | 5A |
| Continuing Calibration | Recovery Range is 85% to 115%<br>Must have opening and closing CCVs (no more than 20 samples) | CCV - J(+)/UJ(-) If %D > 15% | 5B |
| Method Blank | One per matrix per batch<br>No results ≥CRQL | U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL)<br><br>UJ(+) if sample result is ≥CRQL and < 5X rule (at reported sample value) | 7 |
| Field Blanks | No results ≥ CRQL | Apply 5X rule; U(+) < action level | 6 |
| MS (Optional) | Lab control limits | Qualify parent only, unless other QC indicates systematic problems.<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>PJ if only one %R outlier | 8 |
| Precision: MS/MSD or LCS/LCSD or sample/dup | Two lab dups per analytical batch<br>RPD ≤ laboratory limits | J(+) if RPD >laboratory limits | 9 |
| LCS (Optional) | Lab control limits | J(+) If %R >UCL<br>J(+)/R(-) If %R <LCL | 10 |
| Surrogates | Suggested Surrogates: 2-fluorobiphenyl, o, or p-terphenyl or pentacosane<br>%R = 50-150% | If %R < LCL, J(+)/UJ(-)<br>If > UCL, J(+)<br>If any %R <10%, J(+)/R(-) | 13 |
| Two analyses for one sample (dilution) | Report only one result per analyte | "DNR" results that should not be used to avoid reporting two results for one sample | 14 |
| Field Duplicates | Use RPD < 35% (water) or < 50% (soil) | Narrate (Use Professional Judgement to qualify) | 9 |

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# APPENDIX B
# QUALIFIED DATA SUMMARY TABLE

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## December 2004 Sampling Event



| Laboratory ID | Method | Chemical Name | Value | Units | Laboratory Qualifiers | Validator Qualifiers | Reason Code |
|---|---|---|---|---|---|---|---|
| CL-MW-1H-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| CL-MW-1H-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| CL-MW-1S-120904 | NWTPH-DxSG | DIESEL RANGE HYDROCARBONS | 14.6 | mg/l | D | DNR | 11 |
| CL-MW-1S-120904 | NWTPH-DxSG | Lube Oil Range Hydrocarbons | 24.0 | mg/l | D | DNR | 11 |
| CL-MW-1S-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| CL-MW-1S-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| CL-MW-6-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| CL-MW-6-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| CL-MW-7-120904 | SW8270 | N-Nitrosodiphenylamine | 0.410 | ug/l | D | J | 5B |
| CL-MW-7-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| D120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| D120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| HS-MW-10-120904 | SW8270 | Anthracene | 0.100 | ug/l | [1] | UJ | 19 |
| HS-MW-10-120904 | SW8270 | Pyrene | 0.100 | ug/l | [6] | UJ | 19 |
| HS-MW-10-120904 | SW8270 | Fluoranthene | 0.100 | ug/l | [4] | UJ | 19 |
| HS-MW-10-120904 | SW8270 | Chrysene | 0.100 | ug/l | [3] | UJ | 19 |
| HS-MW-10-120904 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | [2] | UJ | 19 |
| HS-MW-10-120904 | SW8270 | Acenaphthene | 5.41 | ug/l | D | J | 19 |
| HS-MW-10-120904 | SW8270 | Phenanthrene | 5.19 | ug/l | Q-39 D | J | 19 |
| HS-MW-10-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | [5] | R | 5B |
| HS-MW-11-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| HS-MW-11-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| HS-MW-13-120904 | SW8270 | Dibenzofuran | 0.100 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | Acenaphtylene | 0.100 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| HS-MW-13-120904 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | UJ | 19 |
| HS-MW-13-120904 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | UJ | 19 |
| HS-MW-4-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| HS-MW-4-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| HS-MW-5-120904 | SW8270 | Dibenzofuran | 0.109 | ug/l | | J | 13 |
| HS-MW-5-120904 | SW8270 | Acenaphthene | 0.639 | ug/l | | J | 13 |
| HS-MW-5-120904 | SW8270 | Phenanthrene | 0.0770 | ug/l | | J | 13 |
| HS-MW-5-120904 | SW8270 | Fluorene | 0.319 | ug/l | | J | 13 |
| HS-MW-5-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| HS-MW-6-121004 | SW8270 | N-Nitrosodiphenylamine | 1.21 | ug/l | D | J | 5B |
| HS-MW-6-121004 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| HS-MW-9-120904 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.0503 | ug/l | | J | 13 |
| HS-MW-9-120904 | SW8270 | Benzo(b)fluoranthene | 0.0261 | ug/l | | J | 13 |
| HS-MW-9-120904 | SW8270 | Benzo(k)fluoranthene | 0.0254 | ug/l | | J | 13 |
| HS-MW-9-120904 | SW8270 | Benzo(a)pyrene | 0.0385 | ug/l | | J | 13 |
| HS-MW-9-120904 | SW8270 | Dibenz(a,h)anthracene | 0.0446 | ug/l | | J | 13 |
| HS-MW-9-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| HS-MW-9-120904 | SW8270 | Naphthalene | 0.0145 | ug/l | | J | 13 |
| IZ-MW-1-120904 | NWTPH-DxSG | DIESEL RANGE HYDROCARBONS | 0.250 | mg/l | U | DNR | 11 |
| IZ-MW-1-120904 | NWTPH-DxSG | Lube Oil Range Hydrocarbons | 0.500 | mg/l | U | DNR | 11 |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## December 2004 Sampling Event



| Laboratory ID | Method | Chemical Name | Value | Units | Laboratory Qualifiers | Validator Qualifiers | Reason Code |
|---|---|---|---|---|---|---|---|
| IZ-MW-1-120904 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.0242 | ug/l | | J | 13 |
| IZ-MW-1-120904 | SW8270 | Benzo(a)pyrene | 0.0146 | ug/l | | J | 13 |
| IZ-MW-1-120904 | SW8270 | Dibenz(a,h)anthracene | 0.0222 | ug/l | | J | 13 |
| IZ-MW-1-120904 | SW8270 | Phenanthrene | 0.0152 | ug/l | | J | 13 |
| IZ-MW-1-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| IZ-MW-1-120904 | SW8270 | Naphthalene | 0.0402 | ug/l | | J | 13 |
| IZ-MW-2-120904 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.0382 | ug/l | | J | 13 |
| IZ-MW-2-120904 | SW8270 | Dibenz(a,h)anthracene | 0.0334 | ug/l | | J | 13 |
| IZ-MW-2-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| IZ-MW-3-120904 | SW8270 | Pyrene | 0.0327 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.0281 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8270 | Acenaphtylene | 0.122 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8270 | Dibenz(a,h)anthracene | 0.0295 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8270 | Acenaphthene | 0.451 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| IZ-MW-3-120904 | SW8270 | 2-Methylnaphthalene | 0.189 | ug/l | | J | 13 |
| IZ-MW-3-120904 | SW8290 | Total Penta-Furans | 42.9 | pg/L | M | U | 21 |
| IZ-MW-3-120904 | SW8290 | Total Tetra-Furans | 24.1 | pg/L | M | U | 21 |
| IZ-MW-4-120904 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | R | 5B |
| TL-MW-10-120904 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | UJ | 5B |
| TL-MW-10-120904 | SW8270 | Pentachlorophenol | 5.00 | ug/l | D U | R | 5B |
| TL-MW-11-120804 | SW8270 | N-Nitrosodiphenylamine | 2.40 | ug/l | D | J | 5B |
| TL-MW-11-120804 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |
| TL-MW-9-120904 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 5B |
| TL-MW-9-120904 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | R | 5B |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## March 2005 Sampling Event



| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| 1Z-MW-1-033005 | SW8270 | 2,4,6-Trichlorophenol | 0.0500 | ug/l | Q-40 U | UJ | 5B |
| 1Z-MW-2-033005 | SW8270 | Pentachlorophenol | 0.411 | ug/l | | J | 5B |
| 1Z-MW-3-033005 | SW8290 | 1,2,3,4,6,7,8-HPCDF | 209 | pg/L | M | U | 21 |
| 1Z-MW-3-033005 | SW8270 | N-Nitrosodiphenylamine | 0.0200 | ug/l | U | UJ | 5B |
| 1Z-MW-3-033005 | SW8270 | Pentachlorophenol | 1.40 | ug/l | Q-41 | J | 5B |
| 1Z-MW-3-033005 | SW8290 | Total Hepta-Furans | 1070 | pg/L | M | U | 21 |
| 1Z-MW-3-033005 | SW8290 | Total Hexa-Furans | 424 | pg/L | M | U | 21 |
| 1Z-MW-3-033005 | SW8290 | Total Penta-Furans | 96.0 | pg/L | M | U | 21 |
| 1Z-MW-3-033005 | SW8290 | Total Tetra-Furans | 55.9 | pg/L | M | U | 21 |
| 1Z-MW-4-033005 | SW8270 | Pentachlorophenol | 0.436 | ug/l | | J | 5B |
| CL-MW-1H-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | 2-Methylnaphthalene | 1.34 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Acenaphthene | 6.35 | ug/l | E | DNR | 20 |
| CL-MW-1H-033105 | SW8270 | Acenaphtylene | 0.895 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Anthracene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Benzo(a)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Benzo(b)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Benzo(k)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Chrysene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Dibenz(a,h)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Dibenzofuran | 1.81 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Fluoranthene | 0.248 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Fluorene | 3.89 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Naphthalene | 0.949 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | N-Nitrosodiphenylamine | 2.56 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Pentachlorophenol | 1.67 | ug/l | | J | 5B |
| CL-MW-1H-033105 | SW8270 | Pentachlorophenol | 0.500 | ug/l | [11] | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Phenanthrene | 0.635 | ug/l | D | DNR | 11 |
| CL-MW-1H-033105 | SW8270 | Pyrene | 0.598 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | 2-Methylnaphthalene | 371 | ug/l | E-01 D | DNR | 20 |
| CL-MW-1S-033105 | SW8270 | Acenaphthene | 13.4 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Acenaphtylene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Benzo(a)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Benzo(a)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |

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| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| CL-MW-1S-033105 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Chrysene | 2.09 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Dibenzofuran | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Fluorene | 12.8 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Naphthalene | 3.55 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | N-Nitrosodiphenylamine | 4.17 | ug/l | D | J | 5B |
| CL-MW-1S-033105 | SW8270 | Pentachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Phenanthrene | 18.9 | ug/l | D | DNR | 11 |
| CL-MW-1S-033105 | SW8270 | Pyrene | 1.92 | ug/l | D | DNR | 11 |
| CL-MW-6-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.08 | ug/l | E | J | 20 |
| CL-MW-6-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | 2,4,5-Trichlorophenol | 1.24 | ug/l | D | DNR | 11 |
| CL-MW-6-033105 | SW8270 | 2,4,6-Trichlorophenol | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | 2-Methylnaphthalene | 37.4 | ug/l | E-01 | DNR | 20 |
| CL-MW-6-033105 | SW8270 | Acenaphthene | 5.23 | ug/l | E | DNR | 20 |
| CL-MW-6-033105 | SW8270 | Acenaphtylene | 1.16 | ug/l | D | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Benzo(a)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Benzo(a)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Benzo(b)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Benzo(g,h,i)perylene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Benzo(k)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Chrysene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Dibenz(a,h)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Dibenzofuran | 2.13 | ug/l | D | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Fluorene | 4.79 | ug/l | E | DNR | 20 |
| CL-MW-6-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-6-033105 | SW8270 | Naphthalene | 11.3 | ug/l | E-01 | DNR | 20 |
| CL-MW-6-033105 | SW8270 | N-Nitrosodiphenylamine | 0.616 | ug/l | D | DNR | 11 |
| CL-MW-6-033105 | SW8270 | N-Nitrosodiphenylamine | 1.06 | ug/l | | J | 5B |
| CL-MW-6-033105 | SW8270 | Pentachlorophenol | 5.99 | ug/l | Q-41 D | J | 5B |
| CL-MW-6-033105 | SW8270 | Pentachlorophenol | 7.37 | ug/l | E Q-41 | DNR | 20 |
| CL-MW-6-033105 | SW8270 | Phenanthrene | 5.73 | ug/l | E | DNR | 20 |
| CL-MW-6-033105 | SW8270 | Pyrene | 0.219 | ug/l | D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | 2,4,5-Trichlorophenol | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | 2,4,6-Trichlorophenol | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | 2-Methylnaphthalene | 37.2 | ug/l | E-01 | DNR | 20 |

# QUALIFIED DATA SUMMARY TABLE
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| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| CL-MW-7-033105 | SW8270 | Acenaphthene | 0.884 | ug/l | D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Acenaphtylene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Benzo(a)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Benzo(a)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Benzo(b)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Benzo(g,h,i)perylene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Benzo(k)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Chrysene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Dibenz(a,h)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Dibenzofuran | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | WTPH-DxS | DIESEL RANGE HYDROCARBONS | 0.250 | mg/l | X U | UJ | 10 |
| CL-MW-7-033105 | WTPH-DxS | DIESEL RANGE HYDROCARBONS | 0.250 | mg/l | U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Fluorene | 0.583 | ug/l | D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | WTPH-DxS | Lube Oil Range Hydrocarbons | 0.500 | mg/l | U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Naphthalene | 0.551 | ug/l | D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | N-Nitrosodiphenylamine | 0.400 | ug/l | D U | DNR | 11 |
| CL-MW-7-033105 | SW8270 | N-Nitrosodiphenylamine | 0.457 | ug/l | | J | 5B |
| CL-MW-7-033105 | SW8270 | Pentachlorophenol | 0.590 | ug/l | Q-41 | J | 5B |
| CL-MW-7-033105 | SW8270 | Pentachlorophenol | 6.27 | ug/l | Q-41 D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Phenanthrene | 0.435 | ug/l | D | DNR | 11 |
| CL-MW-7-033105 | SW8270 | Pyrene | 0.200 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | 2,4,5-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | [8] | UJ | 5B, 9 |
| D033105 | SW8270 | 2,4,6-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | 2-Methylnaphthalene | 598 | ug/l | E-01 D | DNR | 20 |
| D033105 | SW8270 | 2-Methylnaphthalene | 436 | ug/l | D | J | 9 |
| D033105 | SW8270 | Acenaphthene | 8.62 | ug/l | D | DNR | 11 |
| D033105 | SW8270 | Acenaphthene | 8.58 | ug/l | D | J | 9 |
| D033105 | SW8270 | Acenaphtylene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Acenaphtylene | 0.100 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | Anthracene | 0.479 | ug/l | D | J | 9 |
| D033105 | SW8270 | Anthracene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Benzo(a)anthracene | 0.280 | ug/l | D | J | 9 |
| D033105 | SW8270 | Benzo(a)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Benzo(a)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Benzo(a)pyrene | 0.225 | ug/l | D | J | 9 |
| D033105 | SW8270 | Benzo(b)fluoranthene | 0.233 | ug/l | D | J | 9 |
| D033105 | SW8270 | Benzo(b)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |

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| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| D033105 | SW8270 | Benzo(g,h,i)perylene | 50.0 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | Benzo(k)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Benzo(k)fluoranthene | 0.234 | ug/l | D | J | 9 |
| D033105 | SW8270 | Chrysene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Chrysene | 0.275 | ug/l | D | J | 9 |
| D033105 | SW8270 | Dibenz(a,h)anthracene | 0.220 | ug/l | D | J | 9 |
| D033105 | SW8270 | Dibenz(a,h)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Dibenzofuran | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Dibenzofuran | 0.546 | ug/l | D | J | 9 |
| D033105 | SW8270 | Fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Fluoranthene | 0.334 | ug/l | D | J | 9 |
| D033105 | SW8270 | Fluorene | 5.39 | ug/l | D | DNR | 11 |
| D033105 | SW8270 | Fluorene | 6.01 | ug/l | D | J | 9 |
| D033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.211 | ug/l | D | J | 9 |
| D033105 | SW8270 | Naphthalene | 1.48 | ug/l | D | J | 9 |
| D033105 | SW8270 | Naphthalene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | N-Nitrosodiphenylamine | 10.0 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | Pentachlorophenol | 25.0 | ug/l | [9] | DNR | 11 |
| D033105 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | UJ | 9 |
| D033105 | SW8270 | Phenanthrene | 5.00 | ug/l | D U | DNR | 11 |
| D033105 | SW8270 | Phenanthrene | 3.29 | ug/l | D | J | 9 |
| D033105 | SW8270 | Pyrene | 0.323 | ug/l | D | J | 9 |
| D033105 | SW8270 | Pyrene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-10-033105 | SW8270 | 2,4,6-Trichlorophenol | 1.00 | ug/l | [5] | UJ | 5B |
| HS-MW-11-040105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 1000 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 1000 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | 2,4,5-Trichlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | [6] | UJ | 5B |
| HS-MW-11-040105 | SW8270 | 2,4,6-Trichlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | 2-Methylnaphthalene | 1060 | ug/l | E-01 D | DNR | 20 |
| HS-MW-11-040105 | SW8270 | Acenaphthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Acenaphtylene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Benzo(a)anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Benzo(a)pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Benzo(b)fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Benzo(g,h,i)perylene | 200 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Benzo(k)fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Chrysene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Dibenz(a,h)anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Dibenzofuran | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Fluorene | 20.0 | ug/l | D U | DNR | 11 |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## March 2005 Sampling Event

| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| HS-MW-11-040105 | SW8270 | Indeno(1,2,3-cd)pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Naphthalene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | N-Nitrosodiphenylamine | 40.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Pentachlorophenol | 100 | ug/l | [7] | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Phenanthrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-040105 | SW8270 | Pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,4,5-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,4,6-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | 2-Methylnaphthalene | 848 | ug/l | E D | DNR | 20 |
| HS-MW-13-040105 | SW8270 | 2-Methylnaphthalene | 830 | ug/l | E-01 D | DNR | 20 |
| HS-MW-13-040105 | SW8270 | Acenaphthene | 22.8 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Acenaphthene | 22.9 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Acenaphtylene | 6.40 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Acenaphtylene | 5.72 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Anthracene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(a)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(a)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(a)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(a)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(b)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(g,h,i)perylene | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Benzo(k)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Chrysene | 1.15 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Chrysene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Dibenz(a,h)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Dibenzofuran | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Dibenzofuran | 3.73 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Fluoranthene | 2.76 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Fluorene | 20.9 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Fluorene | 22.0 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Indeno(1,2,3-cd)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Naphthalene | 49.8 | ug/l | E D | DNR | 20 |
| HS-MW-13-040105 | SW8270 | Naphthalene | 58.2 | ug/l | D | DNR | 11 |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## March 2005 Sampling Event

| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| HS-MW-13-040105 | SW8270 | N-Nitrosodiphenylamine | 15.2 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | N-Nitrosodiphenylamine | 15.7 | ug/l | D | J | 5B |
| HS-MW-13-040105 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Pentachlorophenol | 4.04 | ug/l | Q-41 D | J | 5B |
| HS-MW-13-040105 | SW8270 | Pentachlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Pentachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Phenanthrene | 38.9 | ug/l | E D | DNR | 20 |
| HS-MW-13-040105 | SW8270 | Phenanthrene | 36.5 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Pyrene | 3.65 | ug/l | D | DNR | 11 |
| HS-MW-13-040105 | SW8270 | Pyrene | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-15-033105 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | Q-40 U | R | 5B |
| HS-MW-4-040105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | 2-Methylnaphthalene | 370 | ug/l | E-01 D | DNR | 20 |
| HS-MW-4-040105 | SW8270 | Acenaphthene | 10.8 | ug/l | D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Acenaphtylene | 2.56 | ug/l | D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Benzo(a)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Benzo(a)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Chrysene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Dibenzofuran | 1.54 | ug/l | D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Fluorene | 8.85 | ug/l | D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Naphthalene | 129 | ug/l | E-01 D | DNR | 20 |
| HS-MW-4-040105 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-040105 | SW8270 | N-Nitrosodiphenylamine | 2.51 | ug/l | D | J | 5B |
| HS-MW-4-040105 | SW8270 | Pentachlorophenol | 5.01 | ug/l | Q-41 D | J | 5B |
| HS-MW-4-040105 | SW8270 | Pentachlorophenol | 35.9 | ug/l | Q-41 D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Phenanthrene | 8.50 | ug/l | D | DNR | 11 |
| HS-MW-4-040105 | SW8270 | Pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | 2-Methylnaphthalene | 29.9 | ug/l | E-01 | DNR | 20 |
| HS-MW-5-033105 | SW8270 | Acenaphthene | 1.09 | ug/l | D | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Acenaphtylene | 0.161 | ug/l | D | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Anthracene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | D U | DNR | 11 |

RG-Haley Site
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| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| HS-MW-5-033105 | SW8270 | Benzo(a)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Benzo(b)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Benzo(k)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Chrysene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Dibenz(a,h)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Dibenzofuran | 0.105 | ug/l | D | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Fluorene | 0.572 | ug/l | D | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Naphthalene | 7.18 | ug/l | E-01 | DNR | 20 |
| HS-MW-5-033105 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | N-Nitrosodiphenylamine | 0.0200 | ug/l | U | UJ | 5B |
| HS-MW-5-033105 | SW8270 | Pentachlorophenol | 0.336 | ug/l | Q-41 | J | 5B |
| HS-MW-5-033105 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Phenanthrene | 0.187 | ug/l | D | DNR | 11 |
| HS-MW-5-033105 | SW8270 | Pyrene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 500 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 0.500 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 0.500 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 500 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,4,5-Trichlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,4,5-Trichlorophenol | 0.0500 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | 2,4,6-Trichlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | 2,4,6-Trichlorophenol | 0.0500 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | 2-Methylnaphthalene | 574 | ug/l | D | J | 9 |
| HS-MW-6-033105 | SW8270 | 2-Methylnaphthalene | 624 | ug/l | E D | DNR | 20 |
| HS-MW-6-033105 | SW8270 | 2-Methylnaphthalene | 384 | ug/l | E-01 | DNR | 20 |
| HS-MW-6-033105 | SW8270 | Acenaphthene | 12.1 | ug/l | D | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Acenaphthene | 11.7 | ug/l | E | DNR | 20 |
| HS-MW-6-033105 | SW8270 | Acenaphthene | 11.7 | ug/l | D | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Acenaphtylene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Acenaphtylene | 1.99 | ug/l | | J | 9 |
| HS-MW-6-033105 | SW8270 | Acenaphtylene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Anthracene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Anthracene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Benzo(a)anthracene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(a)anthracene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Benzo(a)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(a)pyrene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(a)pyrene | 0.0100 | ug/l | U | UJ | 9 |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## March 2005 Sampling Event



| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| HS-MW-6-033105 | SW8270 | Benzo(a)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(b)fluoranthene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Benzo(b)fluoranthene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(g,h,i)perylene | 0.100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(g,h,i)perylene | 100 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Benzo(k)fluoranthene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Benzo(k)fluoranthene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Chrysene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Chrysene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Chrysene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Dibenz(a,h)anthracene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Dibenz(a,h)anthracene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Dibenzofuran | 2.98 | ug/l | D | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Dibenzofuran | 3.04 | ug/l | | J | 9 |
| HS-MW-6-033105 | SW8270 | Dibenzofuran | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Fluoranthene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Fluoranthene | 0.0663 | ug/l | | J | 9 |
| HS-MW-6-033105 | SW8270 | Fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Fluorene | 7.63 | ug/l | E | DNR | 20 |
| HS-MW-6-033105 | SW8270 | Fluorene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Fluorene | 7.91 | ug/l | D | J | 9 |
| HS-MW-6-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.0100 | ug/l | U | UJ | 9 |
| HS-MW-6-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Naphthalene | 3.34 | ug/l | D | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Naphthalene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Naphthalene | 1.41 | ug/l | | J | 9 |
| HS-MW-6-033105 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | [4] | DNR | 11 |
| HS-MW-6-033105 | SW8270 | N-Nitrosodiphenylamine | 0.0200 | ug/l | U | UJ | 5B, 9 |
| HS-MW-6-033105 | SW8270 | N-Nitrosodiphenylamine | 20.0 | ug/l | [3] | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Pentachlorophenol | 0.678 | ug/l | Q-41 | J | 5B, 9 |
| HS-MW-6-033105 | SW8270 | Pentachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Pentachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Phenanthrene | 4.81 | ug/l | D | J | 9 |
| HS-MW-6-033105 | SW8270 | Phenanthrene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Phenanthrene | 4.39 | ug/l | E | DNR | 20 |
| HS-MW-6-033105 | SW8270 | Pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Pyrene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-6-033105 | SW8270 | Pyrene | 0.0720 | ug/l | | J | 9 |
| HS-MW-9-033105 | SW8270 | Pentachlorophenol | 0.313 | ug/l | | J | 5B |
| TL-MW-10-040105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |

RG-Haley Site
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| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| TL-MW-10-040105 | SW8270 | 2,4,5-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | 2,4,6-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | 2-Methylnaphthalene | 141 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Acenaphthene | 336 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Acenaphtylene | 87.4 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Anthracene | 179 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Benzo(a)anthracene | 36.3 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Benzo(a)pyrene | 10.3 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Benzo(b)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Benzo(g,h,i)perylene | 50.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Benzo(k)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Chrysene | 53.1 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Dibenz(a,h)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Dibenzofuran | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Fluoranthene | 63.2 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Fluorene | 426 | ug/l | E D | DNR | 20 |
| TL-MW-10-040105 | SW8270 | Indeno(1,2,3-cd)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Naphthalene | 41.2 | ug/l | D | DNR | 11 |
| TL-MW-10-040105 | SW8270 | N-Nitrosodiphenylamine | 790 | ug/l | E-01 D | DNR | 20 |
| TL-MW-10-040105 | SW8270 | N-Nitrosodiphenylamine | 824 | ug/l | D | J | 5B |
| TL-MW-10-040105 | SW8270 | Pentachlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-040105 | SW8270 | Phenanthrene | 1130 | ug/l | E D | DNR | 20 |
| TL-MW-10-040105 | SW8270 | Pyrene | 186 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | [10] | DNR | 11 |
| TL-MW-11-033105 | SW8270 | 2-Methylnaphthalene | 8.17 | ug/l | E | DNR | 20 |
| TL-MW-11-033105 | SW8270 | Acenaphthene | 0.595 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Acenaphtylene | 0.151 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Benzo(a)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Benzo(b)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Benzo(k)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Chrysene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Dibenz(a,h)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Dibenzofuran | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Fluorene | 0.611 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Naphthalene | 0.128 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | N-Nitrosodiphenylamine | 0.231 | ug/l | | J | 5B |
| TL-MW-11-033105 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Pentachlorophenol | 0.348 | ug/l | Q-41 | J | 5B |

# QUALIFIED DATA SUMMARY TABLE
## RG-Haley Site
## March 2005 Sampling Event

| Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| TL-MW-11-033105 | SW8270 | Pentachlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Phenanthrene | 0.842 | ug/l | D | DNR | 11 |
| TL-MW-11-033105 | SW8270 | Pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | 2-Methylnaphthalene | 1.00 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Acenaphthene | 2.95 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Acenaphtylene | 0.492 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Anthracene | 0.814 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Benzo(a)anthracene | 0.345 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Benzo(a)pyrene | 0.298 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Benzo(b)fluoranthene | 0.278 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Benzo(k)fluoranthene | 0.313 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Chrysene | 0.363 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Dibenz(a,h)anthracene | 0.268 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Dibenzofuran | 0.523 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Fluoranthene | 0.429 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Fluorene | 1.43 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.273 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Naphthalene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-9-033105 | SW8270 | N-Nitrosodiphenylamine | 2.75 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | N-Nitrosodiphenylamine | 1.80 | ug/l | | J | 5B |
| TL-MW-9-033105 | SW8270 | Pentachlorophenol | 1.46 | ug/l | Q-41 | J | 5B |
| TL-MW-9-033105 | SW8270 | Pentachlorophenol | 1.85 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Phenanthrene | 1.61 | ug/l | D | DNR | 11 |
| TL-MW-9-033105 | SW8270 | Pyrene | 0.575 | ug/l | D | DNR | 11 |

GeoEngineers

# APPENDIX B
## ECOCHEM, INC., DATA VALIDATION REPORT (SEPTEMBER 2005 GROUNDWATER SAMPLING EVENT

EcoChem, Inc.

Environmental Science and Chemistry

# DATA VALIDATION REPORT

## R.G. HALEY SITE

## SDG: B5I0364

**Prepared for:**

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**Prepared by:**

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EcoChem Project: C2206-2

November 28, 2005

**Approved for Release:**

Christine Ransom
Project Manager
**EcoChem, Inc.**

# PROJECT NARRATIVE

### *Basis for the Data Validation*

This report summarizes the results of the full validation (Level IV) performed on twenty-one water samples collected for the R.G. Haley site. See the **SAMPLE INDEX** for a complete list of all samples for which data were reviewed.

North Creek Analytical Laboratories, Bothell, Washington analyzed the samples for semivolatile compounds and diesel range organic compounds (including lube oils). Frontier Analytical Laboratory, El Dorado Hills, California performed the dioxin/furan analysis. The analytical methods and EcoChem project chemists are listed in the table below.

ANALYSIS METHODS AND ECOCHEM CHEMISTS

| Analysis | Method | Primary Review | Secondary Review |
|---|---|---|---|
| Semivolatile Organic Compounds (SVOC) | SW8270 | Mark Brindle | John Mitchell |
| Dioxin/Furan Compounds | SW8290 | Mark Brindle | John Mitchell |
| Diesel Range Organic Compounds & Lube Oil | NWTPHDx | Mark Brindle | John Mitchell |

The data were reviewed using guidance and quality control criteria documented in the analytical methods, the quality assurance project plan (QAPP) and the *National Functional Guidelines for Organic Data Review* (USEPA 1999).

Data qualifier definitions, reason codes, and validation criteria are included as **APPENDIX A.** **APPENDIX B** contains the Qualified Data Summary Table. Communication records are included as **APPENDIX C.** Data validation worksheets will be kept on file at EcoChem.

SAMPLE INDEX
R.G. Haley Site
September 2005 Sampling Event

| Client ID | Laboratory ID | SVOC | Dioxins | NWTPH-Dx |
|---|---|---|---|---|
| HS-MW-4-090105 | B5I0364-01 | X | | X |
| HS-MW-5-091505 | B5I0364-02 | X | | X |
| HS-MW-6-091405 | B5I0364-03 | X | | X |
| HS-MW-9-091505 | B5I0364-04 | X | | X |
| HS-MW-10-091505 | B5I0364-05 | X | | X |
| HS-MW-11-091505 | B5I0364-06 | X | | X |
| HS-MW-13-091505 | B5I0364-07 | X | | X |
| HS-MW-15-091605 | B5I0364-08 | X | | X |
| D091405 | B5I0364-09 | X | | X |
| TL-MW-9-091405 | B5I0364-10 | X | | X |
| TL-MW-10-091405 | B5I0364-11 | X | | X |
| TL-MW-11-091405 | B5I0364-12 | X | | X |
| 1Z-MW-1-091505 | B5I0364-13 | X | | X |
| 1Z-MW-2-091505 | B5I0364-14 | X | | X |
| 1Z-MW-3-091505 | B5I0364-15 | X | X | X |
| 1Z-MW-4-091505 | B5I0364-16 | X | | X |
| CL-MW-1S-091405 | B5I0364-17 | X | | X |
| CL-MW-1D-091405 | B5I0364-18 | | | X |
| CL-MW-1H-091505 | B5I0364-19 | X | | X |
| CL-MW-6-091405 | B5I0364-20 | X | | X |
| CL-MW-7-091405 | B5I0364-21 | X | | X |

# DATA VALIDATION REPORT
# R.G. Haley Site
# Semivolatile Organic Compounds
# EPA Method SW8270C
# SDG: B5I0364

This report documents the review of analytical data from the analyses of water samples and the associated laboratory quality control samples. North Creek Analytical, Bothell, Washington, analyzed the samples. Full validation (Level IV) was performed on all data. Refer to the **SAMPLE INDEX** for a list of the individual samples.

## I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

## II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| 1 | Holding Times and Sample Receipt | | Laboratory Control Samples (LCS/LCSD) |
| | GC/MS Instrument Performance Check | 2 | Field Duplicates |
| 2 | Initial Calibration (ICAL) | 1 | Internal Standards |
| 2 | Continuing Calibration (CCAL) | | Compound Identification |
| | Laboratory Blanks | 1 | Calculation Verification |
| 1 | Surrogate Compounds | 2 | Compound Quantification and Reporting Limits |
| 2 | Matrix Spikes/Matrix Spike Duplicates (MS/MSD) | 1 | Target Analyte List |

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

### Holding Times and Sample Receipt

The sample cooler temperature was less than the lower control limit of 2.0°C, at 1.2ºC. Sample results were judged to be unaffected, therefore no action was taken on this basis.

### Initial Calibration (ICAL)

The relative response factor (RRF) values were all acceptable. The relative standard deviation (%RSD) values were within the 30% control limit for all initial calibrations, with the following exceptions: For the ICAL analyzed 10/4/05, the %RSD values for benzo(b)fluoranthene (31.1%), benzo(k)fluoranthene (50.5%), and benzo(a)pyrene (36.9%) were greater than the 30% control limit. Positive results for these analytes were estimated (J-5A) in Samples HS-MW-13 and TL-MW-10.

## Continuing Calibration (CCAL)

The relative response factor (RRF) values were greater than the 0.05 minimum control limit, with the exception noted below. The percent difference (%D) values were within the ±25% control limit for all continuing calibrations (CCAL), with the exceptions noted below:

- 9/26/05: pentachlorophenol (high response). The blank spike/blank spike duplicate (BS/BSD) were the only associated analyses. Qualifiers are not issued to QC samples.
- 10/3/05: pentachlorophenol and 2,3,4,6-tetrachlorophenol (high responses). These compounds were not detected in the associated samples. The reporting limits were not affected by the potential high bias, thus no qualifiers were applied.
- 10/17/05: pentachlorophenol (low response and RRF value outlier); 2,3,5,6-tetrachloro-phenol (low response). HS-MW-6 MS/MSD were the only associated analyses. Qualifiers are not issued to QC samples.

## Surrogate Compounds

One or more surrogate percent recovery (%R) values were outside the control limits in eight of the twenty-one samples. Most of the samples in this batch were reanalyzed at dilutions. For all of the samples, either the surrogates were acceptable in one of the analyses, or only one surrogate in a fraction (acid or base-neutral) was outside the control limits. The samples with single surrogate outliers are summarized in the data validation worksheets. For Samples TL-MW-10 (500x & 100x) and CL-MW-6 (5,000x & 500x), the extracts were analyzed at very high dilution factors. Surrogate compounds would not be recovered in such cases. No action was taken based on surrogate recovery outliers.

## Matrix Spike/Matrix Spike Duplicate Analyses (MS/MSD)

For the MS/MSD set performed using Sample HS-MW-5, the %R values for N-nitrosodiphenylamine and pentachlorophenol were less than the lower control limits and the relative percent difference (RPD) value for pentachlorophenol exceeded the control limit. These analytes were not detected in the parent sample. The reporting limits for N-nitrosodiphenylamine and pentachlorophenol were estimated (UJ-8) in the parent sample due to the potential low bias. Because pentachlorophenol was not detected in the parent sample, no action was taken for the RPD outlier.

## Field Duplicates

RPD values were calculated for all compounds with concentrations greater than four times the reporting limit. For compounds with concentrations less than four times the reporting limit, the difference between the reported concentrations was evaluated. The results were compared to control limits of 30% for the RPD values, or difference values less than the reporting limit.

Samples HS-MW-5 and D091405 were submitted as field duplicates. The RPD values and/or difference values were outside of the control limits for acenaphthene, fluorene, 2-methylnaphthalene, naphthalene, phenanthrene, and dibenzofuran. The reported results for these

analytes were qualified as estimated (J-9) in both samples.

### Internal Standards

For many of the samples (including reanalyses), there were internal standard areas which were outside the control limits (–50%/+100% of the area of the internal standard in the associated CCAL). Most of the outliers were less than the lower control limit, indicating a potential low bias.

For each sample, the target compounds associated with the internal standard outliers were reported from a reanalysis with acceptable internal standard areas; therefore no qualifiers were issued.

### Compound Quantitation and Reporting Limits

Due to the presence of high levels of target analytes and/or surrogate outliers, most of the samples were analyzed more than once, usually at a higher dilution level. The laboratory reported multiple sets of results for most of the samples.

Target analytes that were present at concentrations greater than the upper calibration range of the instrument were qualified as do-not-report (DNR-20), and should be reported from the appropriate dilution. All of the results from the dilutions, except the target analytes of interest, were qualified as do-not-report (DNR-11) and should be reported from the analysis with the lowest possible dilution. After the DNR qualifiers were issued, only one reported result remains for each compound in each sample.

### Calculation Verification

Several results were verified by recalculation from the raw data. The following errors were noted:

The laboratory incorrectly reported the %D values for all CCAL. The reported %D values were calculated using the concentrations, rather than the RRF values. The correct %D values were reported in the raw data, and were used to evaluate the sample results. No further action was taken, other than to note this discrepancy.

### Target Analyte List

The reported target analyte list includes three compounds that were not part of the target analyte list specified in the quality assurance program plan (QAPP): dibenz(a,h)anthracene, 2,3,4,5/2,3,4,6-tetrachlorophenol, and 2,4,5-trichlorophenol. No action was taken, other than to note the discrepancy.

## III. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Precision was acceptable, as demonstrated by the field duplicate, laboratory control sample/laboratory control sample duplicate (LCS/LCSD), and MS/MSD RPD values, with the exceptions noted above. Accuracy was also acceptable, as demonstrated by the surrogate,

LCS/LCSD, and MS/MSD recovery values, with the previously noted exceptions.

Data were estimated due to field duplicate precision outliers, MS/MSD recovery outliers, and initial calibration %RSD outliers. Data were qualified as do-not-report (DNR) in order to indicate which values should be used when multiple results were reported for a sample.

Data that have been qualified as do-not-report should not be used for any purpose.

All other data, as qualified, are acceptable for use.

# DATA VALIDATION REPORT
# R.G. Haley Site
# Diesel Range Organic Compounds & Lube Oil
# Method NWTPH-Dx
# SDG: B5I0364

This report documents the review of analytical data from the analyses of water samples and the associated laboratory quality control samples. North Creek Analytical, Bothell, Washington, analyzed the samples. Full validation (Level IV) was performed on all data. Refer to the **SAMPLE INDEX** for a list of the individual samples.

## I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

## II. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| 1 | Holding Times and Sample Receipt | 1 | Matrix Spikes/Matrix Spike Duplicates (MS/MSD) |
| | Initial Calibration (ICAL) | | Laboratory Control Samples (LCS) |
| | Continuing Calibration (CCAL) | 2 | Field Duplicates |
| | Blanks (Method & Field) | 1 | Compound Quantitation and Reporting Limits |
| 1 | Surrogate Compounds | 1 | Calculation Verification |

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

### Holding Times and Sample Receipt

The sample cooler temperature was less than the lower control limit of 2.0°C, at 1.2ºC. Sample results were judged to be unaffected, therefore no action was taken on this basis.

### Surrogate Compounds

Due to the dilution factors, the surrogates were not recovered in Samples TL-MW-10-090145 (100x) and CL-MW-6-091405 (100x). No action was taken.

### Matrix Spike/Matrix Spike Duplicate Analyses

No matrix spike/matrix spike duplicates (MS/MSD) were analyzed for the lube oil range. As the diesel range MS/MSD analyses were acceptable, no action was taken.

## Field Duplicates

Samples HW-MW-5-091505 and D091405 were submitted as field duplicates. Diesel range hydrocarbons were reported in the duplicate, but not in the sample. The difference between results was greater than the reporting limit. The diesel results for these two samples were estimated (UJ/J-9).

## Compound Quantitation and Reporting Limits

The target reporting limit of 0.25 mg/L for the lube oil range was not met; the laboratory reporting limit was 0.50 mg/L. No action was taken.

## Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

# III. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Precision was acceptable, as demonstrated by the field duplicate, laboratory control sample/laboratory control sample duplicate (LCS/LCSD), and MS/MSD RPD values, with the exception noted above. Accuracy was also acceptable, as demonstrated by the surrogate, LCS/LCSD, and MS/MSD recovery values.

Data were estimated based on a field duplicate precision outlier.

All data, as qualified, are acceptable for use.

# DATA VALIDATION REPORT
# R.G. Haley Site
# Dioxin/Furan Compounds
# EPA Method SW 8290
# SDG: B5I0364

This report documents the review of analytical data from the analysis of one water sample and the associated laboratory quality control samples. Frontier Analytical Laboratory, El Dorado Hills, California, analyzed the sample. Full validation (Level IV) was performed on all data.

## I. DATA PACKAGE COMPLETENESS

The laboratory narrative indicated no problems with sample receipt. The laboratory submitted all of the necessary deliverables. Adequate corrective action processes were followed and anomalies were discussed in the case narrative.

## II. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

| | | | |
|---|---|---|---|
| 1 | Holding Times and Sample Receipt | 1 | Matrix Spike/Matrix Spike Duplicates (MS/MSD) |
| | GC/MS Instrument Performance Check | | Labeled Compound Recovery |
| | Initial Calibration (ICAL) | | Ongoing Precision and Recovery (OPR) |
| | Continuing Verification (CVER) | | Compound Identification |
| | Isomer Specificity | 1 | Compound Quantitation and Reporting Limits |
| | Laboratory Blank | | |

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

### Holding Times and Sample Receipt

The sample cooler was received outside the control limits of 4°C ±2°, at 1.2°C. This temperature outlier was judged to have no impact on the data and no action was taken.

### Matrix Spike/Matrix Spike Duplicates

Matrix Spike/Matrix Spike Duplicate samples were not analyzed. Laboratory accuracy was evaluated using the labeled compound and ongoing precision and recovery (OPR) standard values. Laboratory precision could not be evaluated.

### Compound Quantitation and Reporting Limits

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

## Overall Assessment

As determined by this evaluation, the laboratory followed the specified method. Laboratory accuracy was acceptable as demonstrated by the recovery values for the OPR samples and labeled compounds. Laboratory precision could not be evaluated.

No data were qualified for any reason. All data, as reported, are acceptable for use.

EcoChem, INC.
Environmental Data Quality

# APPENDIX A
# DATA QUALIFIER DEFINITIONS REASON CODES AND CRITERIA TABLES

# DATA VALIDATION QUALIFIER CODES
# National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

| | |
|---|---|
| U | The analyte was analyzed for, but was not detected above the reported sample quantitation limit. |
| J | The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. |
| N | The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification". |
| NJ | The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration. |
| UJ | The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. |
| R | The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. |

The following is an EcoChem qualifier that may also be assigned during the data review process:

| | |
|---|---|
| DNR | Do not report; a more appropriate result is reported from another analysis or dilution. |

# DATA QUALIFIER REASON CODES

| | |
|---|---|
| 1 | Holding Time/Sample Preservation |
| 2 | Chromatographic pattern in sample does not match pattern of calibration standard. |
| 3 | Compound Confirmation |
| 4 | Tentatively Identified Compound (TIC) (associated with NJ only) |
| 5A | Calibration (initial) |
| 5B | Calibration (continuing) |
| 6 | Field Blank Contamination |
| 7 | Lab Blank Contamination (e.g., method blank, instrument, etc.) |
| 8 | Matrix Spike(MS & MSD) Recoveries |
| 9 | Precision (all replicates) |
| 10 | Laboratory Control Sample Recoveries |
| 11 | A more appropriate result is reported (associated with “R” and “DNR” only) |
| 12 | Reference Material |
| 13 | Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards) |
| 14 | Other (define in validation report) |
| 15 | GFAA Post Digestion Spike Recoveries |
| 16 | ICP Serial Dilution % Difference |
| 17 | ICP Interference Check Standard Recovery |
| 18 | Trip Blank Contamination |
| 19 | Internal Standard Performance (e.g., area, retention time, recovery) |
| 20 | Linear Range Exceeded |
| 21 | Potential False Positives |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Continuing Calibration | Analyzed at the start and end of each 12 hour shift.<br>%D+/-20% for native compounds<br>%D +/-30% for labeled compounds<br>(Must meet limits in Table 6 for 1613B)<br>(If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the 2 CCAL may be used to calculate samples per Section 8.3.2.4 of 8290) | J(+)/UJ(-) natives if %D = 30% - 75%<br>R(+/-) if %D > 75% | 5B |
| | Abs. RT of $^{13}C_{12}$-1234-TCDD and $^{13}C12$-123789-HxCDD +/- 15 sec of ICAL. | EcoChem PJ, see ICAL section of TM-05 | |
| | RRT of all other compounds must meet table 2 of 1613B. | EcoChem PJ, see TM-05 | |
| | Ion Abundance ratios within QC limits<br>(Table 8 of method 8290)<br>(Table 9 of method 1613B) | EcoChem PJ, see TM-05 | |
| | S/N ratio > 10 | EcoChem PJ, see ICAL section of TM-05 | |
| Method Blank | One per matrix per batch<br>No positive results | If sample result <5X action level, qualify U at reported value. | 7 |
| Field Blanks (Not Required) | No positive results | If sample result <5X action level, qualify U at reported value. | 6 |
| LCS / OPR | Concentrations must meet limits in Table 6 of method 1613B or lab limits. | J(+) if %R > UCL<br>J(+)/UJ(-) if %R < LCL<br>J(+)/R(-) using PJ if %R <<LCL (< 10%) | 10 |
| MS/MSD (recovery) | May not analyze MS/MSD<br>%R should meet lab limits. | Qualify parent only unless other QC indicates systematic problems:<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>J(+)/R(-) if both %R < 10%<br>PJ if only one %R outlier | 8 |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | Waters/Solids <4°C<br>Tissues <10°C | EcoChem PJ, see TM-05 | 1 |
| Holding Time | Water: 30 days from collection<br>Soil: 30 days from collection<br>Analysis: 40 days from extraction<br>Note: Under CWA, SDWA, and RCRA the HT for H2O is 7 days | J(+)/UJ(-) if ext > 30days<br>J(+)/UJ(-) if analysis > 40 Days<br>EcoChem PJ, see TM-05 | 1 |
| Mass Resolution | >=10,000 resolving power at m/z 304.9824<br>Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) .<br>Analyzed prior to ICAL and at the start and end of each 12 hr. shift | R(+/-) if not met | 14 |
| Window Defining Mix and Column Performance Mix | Window defining mixture/Isomer specificity std run before ICAL and CCAL<br>Valley < 25% (valley = (x/y)*100%)<br>x = ht. of TCDD<br>y = baseline to bottom of valley<br>For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290) | J(+) if valley > 25% | 5A (ICAL)<br>5B (CCAL |
| Initial Calibration | ICAL: Minimum of five standards<br>%RSD < 20% for native compounds<br>%RSD <30% for labeled compounds<br>(%RSD <35% for labeled compounds under 1613b) | J(+) natives if %RSD > 20% | 5A |
| | Abs. RT of $^{13}C_{12}$-1234-TCDD<br>>25 min on DB5<br>>15 min on DB-225 | EcoChem PJ, see TM-05 | |
| | Ion Abundance ratios within QC limits<br>(Table 8 of method 8290)<br>(Table 9 of method 1613B) | EcoChem PJ, see TM-05 | |
| | S/N ratio > 10 for all native and labeled compounds in CS1 std. | If <10, elevate Det. Limit or R(-) | |

# EcoChem Validation Guidelines (Based on Organic NFG 1999)
# Semivolatile Analysis by GC/MS

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| MS/MSD (recovery) | One per matrix per batch<br>Use method acceptance criteria | Qualify parent only unless other QC indicates systematic problems:<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>J(+)/R(-) if both %R < 10%<br>**PJ if only one %R outlier** | 8 |
| MS/MSD (RPD) | One per matrix per batch<br>Use method acceptance criteria | J(+) if RPD > CL | 9 |
| LCS<br>**low conc. H2O SVOA** | One per lab batch<br>Within method control limits | J(+) assoc. cmpd if > UCL<br>J(+)/R(-) assoc. cmpd if < LCL<br>J(+)/R(-) all cmpds if half are < LCL | 10 |
| LCS<br>**regular SVOA (H2O & solid)** | One per lab batch<br>Lab or method control limits | J(+) if %R > UCL J(+)/UJ(-) if %R <LCL<br>J(+)/R(-) if %R < 10% **(EcoChem PJ)** | 10 |
| LCS/LCSD<br>*(if required)* | One set per matrix and batch of 20 samples<br>RPD < 35% | J(+)/UJ(-) assoc. cmpd. in all samples | 9 |
| Surrogates | Minimum of 3 acid and 3 base/neutral compounds<br>Use method acceptance criteria | Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10%<br>J(+) if %R > UCL J(+)/UJ(-) if %R < LCL<br>J(+)/R(-) if %R < 10% | 13 |
| Internal Standards | Added to all samples<br>Acceptable Range: IS area 50% to 200% of CCAL area<br>RT within 30 seconds of CC RT | J(+) if > 200%<br>J(+)/UJ(-) if < 50%<br>J(+)/R(-) if < 25%<br>R T>30 seconds, **narrate and Notify PM** | 19 |
| Field Duplicates | Use QAPP limits<br>If no QAPP: Use RPD < 35% (water) or < 50% (soil) | Narrate and qualify if required by project<br>**(EcoChem PJ)** | 9 |
| TICs | Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification | R(+) common laboratory contaminants<br>R(+) target compouds from other fractions<br>**See Technical Director for ID issues** | 4 |
| Quantitation/ Identification | RRT within 0.06 of standard RRT<br>Ion relative intensity within 20% of standard<br>All ions in std. at > 10% intensity must be present in sample | **See Technical Director if outliers** | 14<br>21 (false +) |

# EcoChem Validation Guidelines (Based on Organic NFG 1999)
## Semivolatile Analysis by GC/MS

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | 4°C ±2° | J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ) | 1 |
| Holding Time | Water: 7 days from collection<br>Soil: 14 days from collection<br>Analysis: 40 days from extraction | Water:<br>J(+)/UJ(-) if ext. > 7 and < 21 days<br>J(+)/R(-) if ext > 21 days (EcoChem PJ)<br>Solids/Wastes:<br>J(+)/UJ(-) if ext. > 14 and < 42 days<br>J(+)/R(-) if ext. > 42 days (EcoChem PJ)<br><br>J(+)/UJ(-) if analysis >40 days | 1 |
| Tuning | DFTPP<br>Beginning of each 12 hour period<br>Method acceptance criteria | R(+/-) all analytes in all samples associated with the tune | 5A |
| Initial Calibration (Minimum 5 stds.) | RRF > 0.05 | (EcoChem PJ, see TM-06)<br>If MDL= reporting limit:<br>J(+)/R(-) if RRF < 0.05<br><br>If reporting limit > MDL:<br>note in worksheet if RRF <0.05 | 5A |
| | %RSD < 30% | (EcoChem PJ, see TM-06)<br>J(+) if %RSD > 30% | 5A |
| Continuing Calibration (Prior to each 12 hr. shift) | RRF > 0.05 | (EcoChem PJ, see TM-06)<br>If MDL= reporting limit:<br>J(+)/R(-) if RRF < 0.05<br><br>If reporting limit > MDL:<br>note in worksheet if RRF <0.05 | 5B |
| | %D <25% | (EcoChem PJ, see TM-06)<br>If > +/-90%: J+/R-<br>If -90% to -26%: J+ (high bias)<br>If 26% to 90%: J+/UJ- (low bias) | 5B |
| Method Blank | One per matrix per batch<br>No results > CRQL | U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL) | 7 |
| | | U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value) | 7 |
| | No TICs present | R(+) TICs using 10X rule | 7 |
| Field Blanks (Not Required) | No results > CRQL | Apply 5X/10X rule; U(+) < action level | 6 |

# State of Washington (and Oregon)
# Total Petroleum Hydrocarbons-Diesel (and Residual) Range

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| Cooler Temperature | 4°C±2°C | J(+)/UJ(-) using Professional Judgement | 2 |
| Holding Time | Water: 14 days from collection (if acidified); 7 days (if unacidified)<br>Soil: 14 days from collection<br>Analysis: 40 days from extraction | J(+)/UJ(-) if ext/analyzed > HT<br>J(+)/R(-) if ext/analyzed > 3X HT (Prof. Judgement) | 1 |
| Retention Time Standards (RTS) | RTS run every 24 hours or at the beginning of each analytical shift<br>(C10 and C24) | Narrate (Use Professional Judgement to qualify) | 5B |
| Initial Calibration | 5 calibration points (All within 15%)<br>Linear Regression: $R^2 \geq 0.990$ | J(+)/UJ(-)<br>If $R^2 < 0.990$ | 5A |
| Continuing Calibration | Recovery Range is 85% to 115%<br>Must have opening and closing CCVs<br>(no more than 20 samples) | CCV - J(+)/UJ(-) If %D > 15% | 5B |
| Method Blank | One per matrix per batch<br>No results ≥CRQL | U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL)<br><br>UJ(+) if sample result is ≥CRQL and < 5X rule (at reported sample value) | 7 |
| Field Blanks | No results ≥ CRQL | Apply 5X rule; U(+) < action level | 6 |
| MS (Optional) | Lab control limits | Qualify parent only, unless other QC indicates systematic problems.<br>J(+) if both %R > UCL<br>J(+)/UJ(-) if both %R < LCL<br>PJ if only one %R outlier | 8 |
| Precision: MS/MSD or LCS/LCSD or sample/dup | Two lab dups per analytical batch<br>RPD ≤ laboratory limits | J(+) if RPD >laboratory limits | 9 |
| LCS (Optional) | Lab control limits | J(+) If %R >UCL<br>J(+)/R(-) If %R <LCL | 10 |
| Surrogates | Suggested Surrogates:<br>2-fluorobiphenyl, o, or p-terphenyl or pentacosane<br>%R = 50-150% | If %R < LCL, J(+)/UJ(-)<br>If > UCL, J(+)<br>If any %R <10%, J(+)/R(-) | 13 |
| Two analyses for one sample (dilution) | Report only one result per analyte | "DNR" results that should not be used to avoid reporting two results for one sample | 14 |
| Field Duplicates | Use RPD < 35% (water) or < 50% (soil) | Narrate (Use Professional Judgement to qualify) | 9 |

# EcoChem Validation Guidelines (Based on EPA Reg. 10 and Method Criteria)
# Dioxin/Furan Analysis by HRMS (Methods 1613B or SW846 - 8290)

| VALIDATION QC ELEMENT | ACCEPTANCE CRITERIA | ACTION | REASON CODE |
|---|---|---|---|
| MS/MSD (RPD) | May not analyze MS/MSD<br>RPD < 20% | J(+) if RPD > CL | 9 |
| Lab Duplicate | RPD <25% if present. | J(+)/UJ(-) if outside limts | 9 |
| Labeled Compounds / Internal Standards | *Method 8290:* %R = 40% - 135% in all samples<br>---<br>*Method 1613B:* %R must meet limits specified inTable 7 | J(+)/UJ(-) if %R = 10% - LCL<br>J(+) if %R > UCL<br>J(+)/R(-) if %R < 10% | 13 |
| Quantitation/ Identification | SIM ions for analyte, Istd, rec. std. Max w/in 2 sec.<br>S/N >2.5<br>IA ratios meet limits in Table 9 of 1613B or Table 8 of 8290<br>RRTs w/in limits in table 2 of 1613B | If RT criteria not met, use PJ (see TM-05)<br>If S/N criteria not met, J(+).<br>if unlabelled ion abundance not met, change to EMPC<br>If labelled ion abundance not met, J(+). | 21 |
| EMPC (estimated maximum possible concentration) | If quantitation idenfication criteria are not met, laboratory should report an EMPC value. | If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit. | 14 |
| Interferences | PCDF interferences from PCDPE | If both detected, change PCDF result to EMPC | 14 |
| Second Column Confirmation | All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis. | Report lower of the two values.<br>If not performed use PJ (see TM-05). | 3 |
| Field Duplicates | Water: RPD < 35%<br>Soil: RPD < 50% | Narrate and qualify if required by project<br>(EcoChem PJ) | 9 |
| Two analyses for one sample | Report only one result per analyte | "DNR" results that should not be used | 11 |

EcoChem, INC.
Environmental Data Quality

# APPENDIX B
# QUALIFIED DATA SUMMARY TABLE

# Qualified Data Summary Table
## R.G. Haley Site
## September 2005 Sampling Event

| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | 2,4,5-Trichlorophenol | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | 2,4,6-Trichlorophenol | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19 | SW8270 | 2-Methylnaphthalene | 10.5 | ug/l | E | DNR | 20 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Acenaphthene | 11.1 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Acenaphtylene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Anthracene | 0.963 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Benzo(a)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Benzo(a)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Benzo(b)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Benzo(g,h,i)perylene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Benzo(k)fluoranthene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Chrysene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Dibenz(a,h)anthracene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Dibenzofuran | 3.31 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Fluoranthene | 0.282 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19 | SW8270 | Fluorene | 4.03 | ug/l | E | DNR | 20 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.200 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Naphthalene | 2.51 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | N-Nitrosodiphenylamine | 0.400 | ug/l | D U | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Phenanthrene | 1.15 | ug/l | D | DNR | 11 |
| CL-MW-1H-091505 | B5I0364-19RE1 | SW8270 | Pyrene | 0.532 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | [15] | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 100 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 100 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | 2,4,5-Trichlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | 2,4,6-Trichlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | 2-Methylnaphthalene | 516 | ug/l | E D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE2 | SW8270 | 2-Methylnaphthalene | 466 | ug/l | E D | DNR | 20 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Acenaphthene | 43.0 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Acenaphtylene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Acenaphtylene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Anthracene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Benzo(a)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Benzo(a)anthracene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Benzo(a)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Benzo(a)pyrene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Benzo(b)fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Benzo(g,h,i)perylene | 20.0 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |

Qualified Data Summary Table
R.G. Haley Site
September 2005 Sampling Event

| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Benzo(k)fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Chrysene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Chrysene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Dibenz(a,h)anthracene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Dibenzofuran | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Dibenzofuran | 13.1 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Fluorene | 29.7 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Fluorene | 31.1 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Indeno(1,2,3-cd)pyrene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Naphthalene | 1.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Naphthalene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | N-Nitrosodiphenylamine | 4.00 | ug/l | D U | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Phenanthrene | 58.7 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Phenanthrene | 58.9 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17 | SW8270 | Pyrene | 6.39 | ug/l | D | DNR | 11 |
| CL-MW-1S-091405 | B5I0364-17RE1 | SW8270 | Pyrene | 2.00 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | 2,3,4,5-Tetrachlorophenol | 2500 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | 2,3,5,6-Tetrachlorophenol | 2500 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | 2,4,5-Trichlorophenol | 250 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | 2,4,6-Trichlorophenol | 250 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20RE1 | SW8270 | 2-Methylnaphthalene | 10600 | ug/l | E D | DNR | 20 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Acenaphthene | 1580 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Acenaphtylene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Anthracene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Benzo(a)anthracene | 68.1 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Benzo(a)pyrene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Benzo(b)fluoranthene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Benzo(g,h,i)perylene | 500 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Benzo(k)fluoranthene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Chrysene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Dibenz(a,h)anthracene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Dibenzofuran | 455 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Fluoranthene | 94.1 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Fluorene | 1130 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Indeno(1,2,3-cd)pyrene | 50.0 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Naphthalene | 1120 | ug/l | D | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | N-Nitrosodiphenylamine | 100 | ug/l | D U | DNR | 11 |
| CL-MW-6-091405 | B5I0364-20RE1 | SW8270 | Phenanthrene | 2000 | ug/l | E D | DNR | 20 |
| CL-MW-6-091405 | B5I0364-20 | SW8270 | Pyrene | 301 | ug/l | D | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 0.500 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 0.500 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | 2,4,5-Trichlorophenol | 0.0500 | ug/l | U | DNR | 11 |

Qualified Data Summary Table
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| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | 2,4,6-Trichlorophenol | 0.0500 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Acenaphthene | 0.537 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Acenaphtylene | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Anthracene | 0.0441 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Benzo(a)anthracene | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Benzo(a)pyrene | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Benzo(b)fluoranthene | 0.0228 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Benzo(g,h,i)perylene | 0.100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Benzo(k)fluoranthene | 0.0561 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Chrysene | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Dibenz(a,h)anthracene | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Dibenzofuran | 0.0100 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Naphthalene | 0.783 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | N-Nitrosodiphenylamine | 0.356 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Phenanthrene | 0.202 | ug/l | | DNR | 11 |
| CL-MW-7-091405 | B5I0364-21RE1 | SW8270 | Pyrene | 0.0575 | ug/l | | DNR | 11 |
| D091405 | B5I0364-09 | SW8270 | 2-Methylnaphthalene | 10.4 | ug/l | D | J | 9 |
| D091405 | B5I0364-09 | SW8270 | Acenaphthene | 7.55 | ug/l | D | J | 9 |
| D091405 | B5I0364-09 | SW8270 | Dibenzofuran | 1.86 | ug/l | D | J | 9 |
| D091405 | B5I0364-09 | SW8270 | Fluorene | 4.73 | ug/l | D | J | 9 |
| D091405 | B5I0364-09 | SW8270 | Naphthalene | 2.28 | ug/l | D | J | 9 |
| D091405 | B5I0364-09 | SW8270 | Phenanthrene | 2.32 | ug/l | D | J | 9 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | 2,3,4,5-Tetrachlorophenol | 1000 | ug/l | [10] | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | 2,3,5,6-Tetrachlorophenol | 1000 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | 2,4,5-Trichlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | 2,4,6-Trichlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06RE1 | SW8270 | 2-Methylnaphthalene | 331 | ug/l | E D | DNR | 20 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Acenaphthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Acenaphtylene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Benzo(a)anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Benzo(a)pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Benzo(b)fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Benzo(g,h,i)perylene | 200 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Benzo(k)fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Chrysene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Dibenz(a,h)anthracene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Dibenzofuran | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Fluoranthene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Fluorene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Indeno(1,2,3-cd)pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Naphthalene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | N-Nitrosodiphenylamine | 40.0 | ug/l | D U | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Phenanthrene | 40.1 | ug/l | D | DNR | 11 |
| HS-MW-11-091505 | B5I0364-06 | SW8270 | Pyrene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-13-091505 | B5I0364-07 | SW8270 | Benzo(a)pyrene | 0.415 | ug/l | D | J | 5A |

# Qualified Data Summary Table
# R.G. Haley Site
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| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| HS-MW-13-091505 | B5I0364-07 | SW8270 | Benzo(b)fluoranthene | 0.210 | ug/l | D | J | 5A |
| HS-MW-13-091505 | B5I0364-07 | SW8270 | Benzo(k)fluoranthene | 0.805 | ug/l | D | J | 5A |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | 2,3,4,5-Tetrachlorophenol | 50.0 | ug/l | [4] | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | 2,3,5,6-Tetrachlorophenol | 50.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 100 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | 2,4,5-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | 2,4,5-Trichlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | 2,4,6-Trichlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | 2,4,6-Trichlorophenol | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | 2-Methylnaphthalene | 419 | ug/l | E D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE2 | SW8270 | 2-Methylnaphthalene | 403 | ug/l | E D | DNR | 20 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Acenaphthene | 21.7 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Acenaphthene | 17.6 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Acenaphtylene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Acenaphtylene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Anthracene | 4.46 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Anthracene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Benzo(a)anthracene | 4.05 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Benzo(a)anthracene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Benzo(a)pyrene | 1.78 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Benzo(a)pyrene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Benzo(b)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Benzo(b)fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Benzo(g,h,i)perylene | 10.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Benzo(g,h,i)perylene | 20.0 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Benzo(k)fluoranthene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Benzo(k)fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Chrysene | 2.62 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Chrysene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Dibenz(a,h)anthracene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Dibenz(a,h)anthracene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Dibenzofuran | 12.0 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Dibenzofuran | 10.5 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Fluoranthene | 2.18 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Fluoranthene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Fluorene | 15.4 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Fluorene | 16.5 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Indeno(1,2,3-cd)pyrene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Indeno(1,2,3-cd)pyrene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Naphthalene | 150 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE2 | SW8270 | Naphthalene | 120 | ug/l | E D | DNR | 20 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | N-Nitrosodiphenylamine | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | N-Nitrosodiphenylamine | 4.00 | ug/l | D U | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Phenanthrene | 12.5 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Phenanthrene | 14.4 | ug/l | D | DNR | 11 |
| HS-MW-4-091505 | B5I0364-01 | SW8270 | Pyrene | 2.85 | ug/l | D | DNR | 11 |

# Qualified Data Summary Table
# R.G. Haley Site
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| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| HS-MW-4-091505 | B5I0364-01RE1 | SW8270 | Pyrene | 2.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | [6] | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | 2-Methylnaphthalene | 21.3 | ug/l | E | DNR | 20 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | 2-Methylnaphthalene | 25.0 | ug/l | D | J | 9 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Acenaphthene | 0.681 | ug/l | | J | 9 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Acenaphthene | 0.830 | ug/l | D | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Acenaphtylene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Anthracene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Benzo(a)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Benzo(b)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Benzo(k)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Chrysene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Dibenz(a,h)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Dibenzofuran | 0.110 | ug/l | | J | 9 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Dibenzofuran | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Fluorene | 0.287 | ug/l | | J | 9 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Fluorene | 0.658 | ug/l | D | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Naphthalene | 5.67 | ug/l | E | DNR | 20 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Naphthalene | 6.20 | ug/l | D | J | 9 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | N-Nitrosodiphenylamine | 0.0200 | ug/l | U | UJ | 8 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Pentachlorophenol | 0.0500 | ug/l | U | UJ | 8 |
| HS-MW-5-091505 | B5I0364-02 | SW8270 | Phenanthrene | 0.0772 | ug/l | | J | 9 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Phenanthrene | 0.299 | ug/l | D | DNR | 11 |
| HS-MW-5-091505 | B5I0364-02RE1 | SW8270 | Pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | 2,3,4,5-Tetrachlorophenol | 250 | ug/l | [12] | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | 2,3,5,6-Tetrachlorophenol | 250 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | 2,4,5-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | 2,4,6-Trichlorophenol | 25.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | 2-Methylnaphthalene | 1300 | ug/l | D | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Acenaphthene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Acenaphtylene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Anthracene | 3110 | ug/l | D | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Benzo(a)anthracene | 596 | ug/l | D | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Benzo(a)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11RE1 | SW8270 | Benzo(a)pyrene | 135 | ug/l | D | J | 5A |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Benzo(b)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11RE1 | SW8270 | Benzo(b)fluoranthene | 57.7 | ug/l | D | J | 5A |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Benzo(g,h,i)perylene | 50.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Benzo(k)fluoranthene | 5.00 | ug/l | D U | DNR | 11 |

# Qualified Data Summary Table
# R.G. Haley Site
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| Client ID | Laboratory ID | Method | Chemical Name | Value | Units | Lab Qualifier | Validator Qualifier | Validator Reason Code |
|---|---|---|---|---|---|---|---|---|
| TL-MW-10-091405 | B5I0364-11RE1 | SW8270 | Benzo(k)fluoranthene | 78.8 | ug/l | D | J | 5A |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Chrysene | 655 | ug/l | D | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Dibenz(a,h)anthracene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Dibenzofuran | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Fluoranthene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Fluorene | 5440 | ug/l | D | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Indeno(1,2,3-cd)pyrene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Naphthalene | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | N-Nitrosodiphenylamine | 10.0 | ug/l | D U | DNR | 11 |
| TL-MW-10-091405 | B5I0364-11RE1 | SW8270 | Phenanthrene | 11300 | ug/l | E D | DNR | 20 |
| TL-MW-10-091405 | B5I0364-11 | SW8270 | Pyrene | 2740 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | 2,3,4,5-Tetrachlorophenol | 5.00 | ug/l | [14] | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | 2,3,5,6-Tetrachlorophenol | 5.00 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | 2,4,5-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | 2,4,6-Trichlorophenol | 0.500 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12 | SW8270 | 2-Methylnaphthalene | 7.22 | ug/l | E | DNR | 20 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Acenaphthene | 0.812 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Acenaphtylene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Benzo(a)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Benzo(a)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Benzo(b)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12 | SW8270 | Benzo(g,h,i)perylene | 0.100 | ug/l | U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Benzo(g,h,i)perylene | 1.00 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Benzo(k)fluoranthene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Chrysene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Dibenz(a,h)anthracene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Dibenzofuran | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Fluoranthene | 0.188 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Fluorene | 0.891 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Indeno(1,2,3-cd)pyrene | 0.100 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Naphthalene | 0.307 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | N-Nitrosodiphenylamine | 0.200 | ug/l | D U | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Phenanthrene | 1.05 | ug/l | D | DNR | 11 |
| TL-MW-11-091405 | B5I0364-12RE1 | SW8270 | Pyrene | 0.225 | ug/l | D | DNR | 11 |
| D091405 | B5I0364-09 | NWTPH-DxSG | Diesel Range Hydrocarbons | 0.887 | mg/l | | J | 9 |
| HS-MW-5-091505 | B5I0364-02 | NWTPH-DxSG | Diesel Range Hydrocarbons | 0.25 | mg/l | U | UJ | 9 |

EcoChem, INC.
Environmental Data Quality

# APPENDIX C
# DATA VALIDATION WORKSHEETS

## Chris Ransom

**From:** Jay Lucas [jlucas@geoengineers.com]
**Sent:** Friday, November 04, 2005 11:08 AM
**To:** Chris Ransom
**Subject:** FW: R.G. Haley International Corporation Site Results B5I0364
**Attachments:** B5I0364 Amended.pdf; B5I0364 Amended.RES; B5I0364 Amended.BCH; B5I0364 Amended.FSM; B5I0364 Amended.SMP; B5I0364 Amended.TST

Chris- here is a revised EDD and I expect to send the hard copy to you Tuesday.
Duplicate- only. Name: D091405. Taken from sample location HS-MW-5
MSDS sample was collected from HS-MW-5
No field blanks.

What is the additional cost for a two week TAT on your validation?

Jay Lucas
Senior Geologist
GeoEngineers, Inc.
206.239.3221 office
206.728.2732 fax
jlucas@geoengineers.com

---

**From:** Jeff Gerdes [mailto:Jgerdes@ncalabs.com]
**Sent:** Friday, November 04, 2005 9:26 AM
**To:** Jay Lucas
**Subject:** RE: R.G. Haley International Corporation Site Results B5I0364

Jay,
They are finishing up the data package today, and I'll have the courier bring it by on Monday. While putting together the data package, the QA dept. found made a few corrections. I was creating an amended report when your e-mail came through. As you know, many of the samples were analyzed at multiple dilutions. We have removed some of the analytes from one dilution of each of the following samples:
HS-MW-4-091505
TL-MW-10-091405
CL-MW-15-091405 (re-shot 1)
CL-MW-7-091405
Each of the analytes removed was reported in a different dilution. I've attached the amended report and EDD.
Jeff

> -----Original Message-----
> **From:** Jay Lucas [mailto:jlucas@geoengineers.com]
> **Sent:** Friday, November 04, 2005 8:45 AM
> **To:** Jeff Gerdes
> **Subject:** RE: R.G. Haley International Corporation Site Results B5I0364
>
> Jeff- I need the hard copies so we can complete our data validation. Can you please have them sent over as soon as possible-and let me know when I should expect to receive them. Thanks.
>
> Jay Lucas
> Senior Geologist
> GeoEngineers, Inc.
> 206.239.3221 office
> 206.728.2732 fax
> jlucas@geoengineers.com

---

# EXHIBIT L-2
## NCA Labs Analytical Report Sample BWT-BS-01

www.ncalabs.com

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541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| BWT-BS-01 | B0B0462-01 | Soil | 02/29/00 18:05 | 02/29/00 21:03 |

North Creek Analytical - Bothell

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Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil** | **Sampled: 02/29/00 18:05** | | **Received: 02/29/00 21:03** | | | | | | |
| **Diesel Range Hydrocarbons** | **2600** | 30.0 | mg/kg dry | 3 | 0C01021 | 03/01/00 | 03/02/00 | NWTPH-Dx | |
| **Lube Oil Range Hydrocarbons** | **130** | 75.0 | " | " | " | " | " | " | |
| *Surrogate: Octacosane* | *115 %* | *50-150* | | | " | " | " | " | *S-05* |

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541.383.9310 fax 541.382.7588

| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Total Metals by EPA 6000/7000 Series Methods

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil Sampled: 02/29/00 18:05 Received: 02/29/00 21:03** | | | | | | | | | |
| Silver | ND | 0.321 | mg/kg dry | 1 | 0C02025 | 03/03/00 | 03/03/00 | EPA 6020 | |
| **Aluminum** | **7530** | 2.58 | " | " | 0C02009 | 03/02/00 | 03/03/00 | EPA 6010B | |
| **Arsenic** | **5.59** | 0.321 | " | " | 0C02025 | 03/03/00 | 03/03/00 | EPA 6020 | |
| **Barium** | **93.3** | 3.21 | " | " | " | " | " | " | |
| Beryllium | ND | 0.321 | " | " | " | " | " | " | |
| **Calcium** | **5890** | 7.73 | " | " | 0C02009 | 03/02/00 | 03/03/00 | EPA 6010B | |
| **Cadmium** | **0.435** | 0.321 | " | " | 0C02025 | 03/03/00 | 03/03/00 | EPA 6020 | |
| **Cobalt** | **8.00** | 0.321 | " | " | " | " | " | " | |
| **Chromium** | **30.8** | 0.321 | " | " | " | " | " | " | |
| **Copper** | **61.3** | 0.321 | " | " | " | " | " | " | |
| **Iron** | **27300** | 41.2 | " | 10 | 0C02009 | 03/02/00 | 03/03/00 | EPA 6010B | |
| **Mercury** | **0.126** | 0.100 | " | 1 | 0C02018 | " | 03/02/00 | EPA 7471A | |
| **Potassium** | **1110** | 5.52 | " | " | 0C03002 | 03/03/00 | 03/03/00 | EPA 6010B | |
| **Magnesium** | **6020** | 5.15 | " | " | 0C02009 | 03/02/00 | 03/03/00 | " | |
| **Manganese** | **241** | 0.641 | " | 2 | 0C02025 | 03/03/00 | 03/05/00 | EPA 6020 | |
| **Nickel** | **26.3** | 0.321 | " | 1 | " | " | 03/03/00 | " | |
| **Lead** | **47.0** | 0.321 | " | " | " | " | " | " | |
| Antimony | ND | 0.321 | " | " | " | " | " | " | |
| **Selenium** | **0.522** | 0.321 | " | " | " | " | " | " | |
| Thallium | ND | 0.321 | " | " | " | " | " | " | |
| **Vanadium** | **36.2** | 0.321 | " | " | " | " | " | " | |
| **Zinc** | **143** | 3.21 | " | " | " | " | " | " | |

North Creek Analytical - Bothell

Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | Reported:<br>03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil Sampled: 02/29/00 18:05 Received: 02/29/00 21:03** | | | | | | | | | |
| **Acenaphthene** | **2.84** | 0.200 | mg/kg dry | 2 | 0C02005 | 03/02/00 | 03/04/00 | EPA 8270C | |
| Acenaphthylene | ND | 0.200 | " | " | " | " | " | " | |
| Aniline | ND | 0.200 | " | " | " | " | " | " | |
| Anthracene | ND | 0.200 | " | " | " | " | " | " | |
| Benzoic Acid | ND | 1.00 | " | " | " | " | " | " | |
| Benzo (a) anthracene | ND | 0.200 | " | " | " | " | " | " | |
| Benzo (b) fluoranthene | ND | 0.200 | " | " | " | " | " | " | |
| Benzo (k) fluoranthene | ND | 0.200 | " | " | " | " | " | " | |
| Benzo (ghi) perylene | ND | 0.200 | " | " | " | " | " | " | |
| Benzo (a) pyrene | ND | 0.200 | " | " | " | " | " | " | |
| Benzyl alcohol | ND | 0.200 | " | " | " | " | " | " | |
| Bis(2-chloroethoxy)methane | ND | 0.200 | " | " | " | " | " | " | |
| Bis(2-chloroethyl)ether | ND | 0.200 | " | " | " | " | " | " | |
| Bis(2-chloroisopropyl)ether | ND | 0.200 | " | " | " | " | " | " | |
| **Bis(2-ethylhexyl)phthalate** | **0.394** | 0.200 | " | " | " | " | " | " | |
| 4-Bromophenyl phenyl ether | ND | 0.200 | " | " | " | " | " | " | |
| Butyl benzyl phthalate | ND | 0.200 | " | " | " | " | " | " | |
| Carbazole | ND | 0.200 | " | " | " | " | " | " | |
| 4-Chloroaniline | ND | 1.00 | " | " | " | " | " | " | |
| 2-Chloronaphthalene | ND | 0.200 | " | " | " | " | " | " | |
| 4-Chloro-3-methylphenol | ND | 0.200 | " | " | " | " | " | " | |
| 2-Chlorophenol | ND | 0.200 | " | " | " | " | " | " | |
| 4-Chlorophenyl phenyl ether | ND | 0.200 | " | " | " | " | " | " | |
| **Chrysene** | **0.222** | 0.200 | " | " | " | " | " | " | |
| Dibenz (a,h) anthracene | ND | 0.200 | " | " | " | " | " | " | |
| Dibenzofuran | ND | 0.200 | " | " | " | " | " | " | |
| Di-n-butyl phthalate | ND | 0.200 | " | " | " | " | " | " | |
| 1,3-Dichlorobenzene | ND | 0.200 | " | " | " | " | " | " | |
| 1,4-Dichlorobenzene | ND | 0.200 | " | " | " | " | " | " | |
| 1,2-Dichlorobenzene | ND | 0.200 | " | " | " | " | " | " | |
| 3,3'-Dichlorobenzidine | ND | 10.0 | " | " | " | " | " | " | |
| 2,4-Dichlorophenol | ND | 0.200 | " | " | " | " | " | " | |
| Diethyl phthalate | ND | 0.200 | " | " | " | " | " | " | |
| 2,4-Dimethylphenol | ND | 0.400 | " | " | " | " | " | " | |
| Dimethyl phthalate | ND | 0.200 | " | " | " | " | " | " | |
| 4,6-Dinitro-2-methylphenol | ND | 1.00 | " | " | " | " | " | " | |
| 2,4-Dinitrophenol | ND | 1.00 | " | " | " | " | " | " | |
| 2,4-Dinitrotoluene | ND | 1.00 | " | " | " | " | " | " | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | Reported: |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil** | **Sampled: 02/29/00 18:05** | | **Received: 02/29/00 21:03** | | | | | | |
| 2,6-Dinitrotoluene | ND | 1.00 | mg/kg dry | 2 | 0C02005 | 03/02/00 | 03/04/00 | EPA 8270C | |
| Di-n-octyl phthalate | ND | 0.200 | " | " | " | " | " | " | |
| **Fluoranthene** | **0.524** | 0.200 | " | " | " | " | " | " | |
| **Fluorene** | **3.52** | 0.200 | " | " | " | " | " | " | |
| Hexachlorobenzene | ND | 0.200 | " | " | " | " | " | " | |
| Hexachlorobutadiene | ND | 0.200 | " | " | " | " | " | " | |
| Hexachlorocyclopentadiene | ND | 1.00 | " | " | " | " | " | " | |
| Hexachloroethane | ND | 0.200 | " | " | " | " | " | " | |
| Indeno (1,2,3-cd) pyrene | ND | 0.200 | " | " | " | " | " | " | |
| Isophorone | ND | 0.200 | " | " | " | " | " | " | |
| **2-Methylnaphthalene** | **33.9** | 1.00 | " | 10 | " | " | 03/06/00 | " | |
| 2-Methylphenol | ND | 0.200 | " | 2 | " | " | 03/04/00 | " | |
| 3 & 4-Methylphenol | ND | 0.200 | " | " | " | " | " | " | |
| **Naphthalene** | **2.09** | 0.200 | " | " | " | " | " | " | |
| 2-Nitroaniline | ND | 1.00 | " | " | " | " | " | " | |
| 3-Nitroaniline | ND | 1.00 | " | " | " | " | " | " | |
| 4-Nitroaniline | ND | 1.00 | " | " | " | " | " | " | |
| Nitrobenzene | ND | 0.200 | " | " | " | " | " | " | |
| 2-Nitrophenol | ND | 0.200 | " | " | " | " | " | " | |
| 4-Nitrophenol | ND | 1.00 | " | " | " | " | " | " | |
| N-Nitrosodiphenylamine | ND | 0.200 | " | " | " | " | " | " | |
| N-Nitrosodi-n-propylamine | ND | 0.200 | " | " | " | " | " | " | |
| Pentachlorophenol | ND | 1.00 | " | " | " | " | " | " | |
| **Phenanthrene** | **7.68** | 0.200 | " | " | " | " | " | " | |
| Phenol | ND | 0.200 | " | " | " | " | " | " | |
| **Pyrene** | **0.786** | 0.200 | " | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | ND | 0.200 | " | " | " | " | " | " | |
| 2,4,5-Trichlorophenol | ND | 0.200 | " | " | " | " | " | " | |
| 2,4,6-Trichlorophenol | ND | 0.200 | " | " | " | " | " | " | |
| *Surrogate: 2-FP* | *69.9 %* | *19-141* | | | " | " | " | " | |
| *Surrogate: Phenol-d6* | *89.8 %* | *44-128* | | | " | " | " | " | |
| *Surrogate: 2,4,6-TBP* | *94.7 %* | *10-137* | | | " | " | " | " | |
| *Surrogate: Nitrobenzene-d5* | *89.8 %* | *33-108* | | | " | " | " | " | |
| *Surrogate: 2-FBP* | *102 %* | *51-124* | | | " | " | " | " | |
| *Surrogate: p-Terphenyl-d14* | *112 %* | *48-149* | | | " | " | " | " | |

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| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## Conventional Chemistry Parameters by APHA/EPA Methods
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil Sampled: 02/29/00 18:05 Received: 02/29/00 21:03** | | | | | | | | | |
| **Total Organic Carbon - Average** | **61000** | 300 | mg/kg dry | 1 | 0C21019 | 03/20/00 | 03/20/00 | EPA 9060 mod. | |
| **Total Organic Carbon - High** | **92300** | 300 | " | " | " | " | " | " | |
| **Total Organic Carbon - Low** | **29800** | 300 | " | " | " | " | " | " | |

North Creek Analytical - Bothell

Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | Reported: |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Physical Parameters by APHA/ASTM/EPA Methods
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **BWT-BS-01 (B0B0462-01) Soil Sampled: 02/29/00 18:05 Received: 02/29/00 21:03** | | | | | | | | | |
| **Dry Weight** | 67.7 | 1.00 | % | 1 | 0C01029 | 03/01/00 | 03/02/00 | BSOPSPL003R07 | |

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|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C01021: Prepared 03/01/00 Using EPA 3550B** | | | | | | | | | | |
| **Blank (0C01021-BLK1)** | | | | | | | | | | |
| Diesel Range Hydrocarbons | ND | 10.0 | mg/kg wet | | | | | | | |
| Lube Oil Range Hydrocarbons | ND | 25.0 | " | | | | | | | |
| *Surrogate: 2-FBP* | *6.54* | | " | *10.6* | | *61.7* | *50-150* | | | |
| **LCS (0C01021-BS1)** | | | | | | | | | | |
| Diesel Range Hydrocarbons | 68.7 | 10.0 | mg/kg wet | 66.2 | | 104 | 60-140 | | | |
| *Surrogate: 2-FBP* | *12.6* | | " | *10.6* | | *119* | *50-150* | | | |
| **Duplicate (0C01021-DUP1)** | | | | | **Source: B0C0006-01** | | | | | |
| Diesel Range Hydrocarbons | ND | 10.0 | mg/kg dry | | ND | | | | 50 | |
| Lube Oil Range Hydrocarbons | ND | 25.0 | " | | 4.24 | | | | 50 | |
| *Surrogate: 2-FBP* | *12.6* | | " | *14.7* | | *85.7* | *50-150* | | | |

North Creek Analytical - Bothell

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|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Total Metals by EPA 6000/7000 Series Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02009: Prepared 03/02/00 Using EPA 3050B** | | | | | | | | | | |
| **Blank (0C02009-BLK1)** | | | | | | | | | | |
| Aluminum | ND | 5.00 | mg/kg wet | | | | | | | |
| Calcium | ND | 15.0 | " | | | | | | | |
| Iron | ND | 8.00 | " | | | | | | | |
| Magnesium | ND | 10.0 | " | | | | | | | |
| **LCS (0C02009-BS1)** | | | | | | | | | | |
| Aluminum | 481 | 5.00 | mg/kg wet | 500 | | 96.2 | 70-130 | | | |
| Calcium | 473 | 15.0 | " | 500 | | 94.6 | 70-130 | | | |
| Iron | 472 | 8.00 | " | 500 | | 94.4 | 70-130 | | | |
| Magnesium | 466 | 10.0 | " | 500 | | 93.2 | 70-130 | | | |
| **Matrix Spike (0C02009-MS1)** | | | | | **Source: B0B0462-01** | | | | | |
| Aluminum | 9060 | 2.72 | mg/kg dry | 401 | 7530 | 382 | 70-130 | | | Q-15 |
| Calcium | 4280 | 8.15 | " | 401 | 5890 | -401 | 70-130 | | | Q-15 |
| Iron | 28800 | 43.5 | " | 401 | 27300 | 374 | 70-130 | | | Q-15 |
| Magnesium | 6170 | 5.43 | " | 401 | 6020 | 37.4 | 70-130 | | | Q-15 |
| **Matrix Spike Dup (0C02009-MSD1)** | | | | | **Source: B0B0462-01** | | | | | |
| Aluminum | 7430 | 2.79 | mg/kg dry | 412 | 7530 | -24.3 | 70-130 | 19.8 | 20 | Q-15 |
| Calcium | 4260 | 8.38 | " | 412 | 5890 | -396 | 70-130 | 0.468 | 20 | Q-15 |
| Iron | 27600 | 44.7 | " | 412 | 27300 | 72.8 | 70-130 | 4.26 | 20 | |
| Magnesium | 4950 | 5.59 | " | 412 | 6020 | -260 | 70-130 | 21.9 | 20 | Q-15 |
| **Batch 0C02018: Prepared 03/02/00 Using EPA 7471A** | | | | | | | | | | |
| **Blank (0C02018-BLK1)** | | | | | | | | | | |
| Mercury | ND | 0.100 | mg/kg wet | | | | | | | |

North Creek Analytical - Bothell

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|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA. 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Total Metals by EPA 6000/7000 Series Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02018: Prepared 03/02/00 Using EPA 7471A** | | | | | | | | | | |
| **LCS (0C02018-BS1)** | | | | | | | | | | |
| Mercury | 1.71 | 0.333 | mg/kg wet | 1.75 | | 97.7 | 80-120 | | | |
| **Matrix Spike (0C02018-MS1)** | | | | | **Source: B0B0371-01** | | | | | |
| Mercury | 1.29 | 0.254 | mg/kg dry | 1.24 | 0.135 | 93.1 | 80-120 | | | |
| **Matrix Spike Dup (0C02018-MSD1)** | | | | | **Source: B0B0371-01** | | | | | |
| Mercury | 1.33 | 0.254 | mg/kg dry | 1.23 | 0.135 | 97.2 | 80-120 | 3.05 | 20 | |
| **Batch 0C02025: Prepared 03/02/00 Using EPA 3050B** | | | | | | | | | | |
| **Blank (0C02025-BLK1)** | | | | | | | | | | |
| Antimony | ND | 0.500 | mg/kg wet | | | | | | | |
| Arsenic | ND | 0.500 | " | | | | | | | |
| Barium | ND | 5.00 | " | | | | | | | |
| Beryllium | ND | 0.500 | " | | | | | | | |
| Cadmium | ND | 0.500 | " | | | | | | | |
| Chromium | ND | 0.500 | " | | | | | | | |
| Cobalt | ND | 0.500 | " | | | | | | | |
| Copper | ND | 0.500 | " | | | | | | | |
| Lead | ND | 0.500 | " | | | | | | | |
| Manganese | ND | 0.500 | " | | | | | | | |
| Nickel | ND | 0.500 | " | | | | | | | |
| Selenium | ND | 0.500 | " | | | | | | | |
| Silver | ND | 0.500 | " | | | | | | | |
| Thallium | ND | 0.500 | " | | | | | | | |
| Vanadium | ND | 0.500 | " | | | | | | | |
| Zinc | 8.00 | 5.00 | " | | | | | | | B |

North Creek Analytical - Bothell

Steve Davis, Project Manager

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|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

# Total Metals by EPA 6000/7000 Series Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02025: Prepared 03/02/00 Using EPA 3050B** | | | | | | | | | | |
| **LCS (0C02025-BS1)** | | | | | | | | | | |
| Antimony | 24.8 | 0.500 | mg/kg wet | 25.0 | | 99.2 | 80-120 | | | |
| Arsenic | 25.0 | 0.500 | " | 25.0 | | 100 | 70-130 | | | |
| Barium | 27.5 | 5.00 | " | 25.0 | | 110 | 80-120 | | | |
| Beryllium | 24.8 | 0.500 | " | 25.0 | | 99.2 | 80-120 | | | |
| Cadmium | 24.9 | 0.500 | " | 25.0 | | 99.6 | 70-130 | | | |
| Chromium | 24.5 | 0.500 | " | 25.0 | | 98.0 | 80-120 | | | |
| Cobalt | 25.3 | 0.500 | " | 25.0 | | 101 | 80-120 | | | |
| Copper | 25.1 | 0.500 | " | 25.0 | | 100 | 80-120 | | | |
| Lead | 27.3 | 0.500 | " | 25.0 | | 109 | 80-120 | | | |
| Manganese | 25.1 | 0.500 | " | 25.0 | | 100 | 80-120 | | | |
| Nickel | 24.5 | 0.500 | " | 25.0 | | 98.0 | 80-120 | | | |
| Selenium | 24.4 | 0.500 | " | 25.0 | | 97.6 | 70-130 | | | |
| Silver | 24.2 | 0.500 | " | 25.0 | | 96.8 | 80-120 | | | |
| Thallium | 25.1 | 0.500 | " | 25.0 | | 100 | 80-120 | | | |
| Vanadium | 23.5 | 0.500 | " | 25.0 | | 94.0 | 80-120 | | | |
| Zinc | 32.4 | 5.00 | " | 25.0 | | 130 | 70-130 | | | |
| **Matrix Spike (0C02025-MS1)** | | | | | **Source: B0B0404-10** | | | | | |
| Antimony | 1.01 | 0.352 | mg/kg dry | 19.7 | 0.0415 | 4.92 | 70-130 | | | Q-13 |
| Arsenic | 19.5 | 0.352 | " | 19.7 | 1.43 | 91.7 | 70-130 | | | |
| Barium | 68.6 | 3.52 | " | 19.7 | 46.6 | 112 | 70-130 | | | |
| Beryllium | 19.2 | 0.352 | " | 19.7 | 0.193 | 96.5 | 70-130 | | | |
| Cadmium | 21.2 | 0.352 | " | 19.7 | 1.65 | 99.2 | 70-130 | | | |
| Chromium | 44.5 | 0.352 | " | 19.7 | 30.0 | 73.6 | 70-130 | | | |
| Cobalt | 26.9 | 0.352 | " | 19.7 | 7.84 | 96.8 | 70-130 | | | |
| Copper | 37.2 | 0.352 | " | 19.7 | 17.8 | 98.5 | 70-130 | | | |
| Lead | 23.7 | 0.352 | " | 19.7 | 2.81 | 106 | 70-130 | | | |
| Manganese | 340 | 1.76 | " | 19.7 | 312 | 142 | 70-130 | | | Q-15 |
| Nickel | 54.2 | 0.352 | " | 19.7 | 36.6 | 89.3 | 70-130 | | | |
| Selenium | 18.1 | 0.352 | " | 19.7 | 0.455 | 89.6 | 70-130 | | | |
| Silver | 17.2 | 0.352 | " | 19.7 | 0.0654 | 87.0 | 70-130 | | | |
| Thallium | 20.2 | 0.352 | " | 19.7 | 0.0961 | 102 | 70-130 | | | |
| Vanadium | 49.7 | 0.352 | " | 19.7 | 34.3 | 78.2 | 70-130 | | | |
| Zinc | 220 | 17.6 | " | 19.7 | 240 | -102 | 70-130 | | | Q-15 |

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|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

# Total Metals by EPA 6000/7000 Series Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02025: Prepared 03/02/00 Using EPA 3050B** | | | | | | | | | | |
| **Matrix Spike Dup (0C02025-MSD1)** | | | | | **Source: B0B0404-10** | | | | | |
| Antimony | 0.536 | 0.362 | mg/kg dry | 20.2 | 0.0415 | 2.45 | 70-130 | 61.3 | 20 | Q-13 |
| Arsenic | 20.6 | 0.362 | " | 20.2 | 1.43 | 94.9 | 70-130 | 5.49 | 20 | |
| Barium | 72.8 | 3.62 | " | 20.2 | 46.6 | 130 | 70-130 | 5.94 | 20 | |
| Beryllium | 20.0 | 0.362 | " | 20.2 | 0.193 | 98.1 | 70-130 | 4.08 | 20 | |
| Cadmium | 22.0 | 0.362 | " | 20.2 | 1.65 | 101 | 70-130 | 3.70 | 20 | |
| Chromium | 47.2 | 0.362 | " | 20.2 | 30.0 | 85.1 | 70-130 | 5.89 | 20 | |
| Cobalt | 28.1 | 0.362 | " | 20.2 | 7.84 | 100 | 70-130 | 4.36 | 20 | |
| Copper | 41.6 | 0.362 | " | 20.2 | 17.8 | 118 | 70-130 | 11.2 | 20 | |
| Lead | 24.6 | 0.362 | " | 20.2 | 2.81 | 108 | 70-130 | 3.73 | 20 | |
| Manganese | 359 | 1.81 | " | 20.2 | 312 | 233 | 70-130 | 5.44 | 20 | Q-15 |
| Nickel | 55.5 | 0.362 | " | 20.2 | 36.6 | 93.6 | 70-130 | 2.37 | 20 | |
| Selenium | 19.0 | 0.362 | " | 20.2 | 0.455 | 91.8 | 70-130 | 4.85 | 20 | |
| Silver | 17.7 | 0.362 | " | 20.2 | 0.0654 | 87.3 | 70-130 | 2.87 | 20 | |
| Thallium | 20.9 | 0.362 | " | 20.2 | 0.0961 | 103 | 70-130 | 3.41 | 20 | |
| Vanadium | 51.8 | 0.362 | " | 20.2 | 34.3 | 86.6 | 70-130 | 4.14 | 20 | |
| Zinc | 297 | 18.1 | " | 20.2 | 240 | 282 | 70-130 | 29.8 | 20 | Q-15 |
| **Post Spike (0C02025-PS1)** | | | | | **Source: B0B0404-10** | | | | | |
| Antimony | 192 | 1.79 | mg/kg dry | 199 | 0.0415 | 96.5 | 70-130 | | | |
| **Batch 0C03002: Prepared 03/03/00 Using EPA 3050B** | | | | | | | | | | |
| **Blank (0C03002-BLK1)** | | | | | | | | | | |
| Potassium | ND | 10.0 | mg/kg wet | | | | | | | |
| **LCS (0C03002-BS1)** | | | | | | | | | | |
| Potassium | 2840 | 10.0 | mg/kg wet | 2500 | | 114 | 70-130 | | | |

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|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## Total Metals by EPA 6000/7000 Series Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C03002: Prepared 03/03/00 Using EPA 3050B** | | | | | | | | | | |
| **Matrix Spike (0C03002-MS1)** | | | | | **Source: B0B0462-01** | | | | | |
| Potassium | 3480 | 5.52 | mg/kg dry | 2040 | 1110 | 116 | 70-130 | | | |
| **Matrix Spike Dup (0C03002-MSD1)** | | | | | **Source: B0B0462-01** | | | | | |
| Potassium | 3670 | 5.49 | mg/kg dry | 2030 | 1110 | 126 | 70-130 | 5.31 | 20 | |

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02005: Prepared 03/02/00 Using EPA 3550B** | | | | | | | | | | |
| **Blank (0C02005-BLK1)** | | | | | | | | | | |
| Acenaphthene | ND | 0.200 | mg/kg wet | | | | | | | |
| Acenaphthylene | ND | 0.200 | " | | | | | | | |
| Aniline | ND | 0.200 | " | | | | | | | |
| Anthracene | ND | 0.200 | " | | | | | | | |
| Benzoic Acid | ND | 1.00 | " | | | | | | | |
| Benzo (a) anthracene | ND | 0.200 | " | | | | | | | |
| Benzo (b) fluoranthene | ND | 0.200 | " | | | | | | | |
| Benzo (k) fluoranthene | ND | 0.200 | " | | | | | | | |
| Benzo (ghi) perylene | ND | 0.200 | " | | | | | | | |
| Benzo (a) pyrene | ND | 0.200 | " | | | | | | | |
| Benzyl alcohol | ND | 0.200 | " | | | | | | | |
| Bis(2-chloroethoxy)methane | ND | 0.200 | " | | | | | | | |
| Bis(2-chloroethyl)ether | ND | 0.200 | " | | | | | | | |
| Bis(2-chloroisopropyl)ether | ND | 0.200 | " | | | | | | | |
| Bis(2-ethylhexyl)phthalate | ND | 0.200 | " | | | | | | | |
| 4-Bromophenyl phenyl ether | ND | 0.200 | " | | | | | | | |
| Butyl benzyl phthalate | ND | 0.200 | " | | | | | | | |
| Carbazole | ND | 0.200 | " | | | | | | | |
| 4-Chloroaniline | ND | 1.00 | " | | | | | | | |
| 2-Chloronaphthalene | ND | 0.200 | " | | | | | | | |
| 4-Chloro-3-methylphenol | ND | 0.200 | " | | | | | | | |
| 2-Chlorophenol | ND | 0.200 | " | | | | | | | |
| 4-Chlorophenyl phenyl ether | ND | 0.200 | " | | | | | | | |
| Chrysene | ND | 0.200 | " | | | | | | | |
| Dibenz (a,h) anthracene | ND | 0.200 | " | | | | | | | |
| Dibenzofuran | ND | 0.200 | " | | | | | | | |
| Di-n-butyl phthalate | ND | 0.200 | " | | | | | | | |
| 1,3-Dichlorobenzene | ND | 0.200 | " | | | | | | | |
| 1,4-Dichlorobenzene | ND | 0.200 | " | | | | | | | |
| 1,2-Dichlorobenzene | ND | 0.200 | " | | | | | | | |
| 3,3'-Dichlorobenzidine | ND | 10.0 | " | | | | | | | |
| 2,4-Dichlorophenol | ND | 0.200 | " | | | | | | | |
| Diethyl phthalate | ND | 0.200 | " | | | | | | | |
| 2,4-Dimethylphenol | ND | 0.400 | " | | | | | | | |

North Creek Analytical - Bothell

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Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02005: Prepared 03/02/00 Using EPA 3550B** | | | | | | | | | | |
| **Blank (0C02005-BLK1)** | | | | | | | | | | |
| Dimethyl phthalate | ND | 0.200 | mg/kg wet | | | | | | | |
| 4,6-Dinitro-2-methylphenol | ND | 1.00 | " | | | | | | | |
| 2,4-Dinitrophenol | ND | 1.00 | " | | | | | | | |
| 2,4-Dinitrotoluene | ND | 1.00 | " | | | | | | | |
| 2,6-Dinitrotoluene | ND | 1.00 | " | | | | | | | |
| Di-n-octyl phthalate | ND | 0.200 | " | | | | | | | |
| Fluoranthene | ND | 0.200 | " | | | | | | | |
| Fluorene | ND | 0.200 | " | | | | | | | |
| Hexachlorobenzene | ND | 0.200 | " | | | | | | | |
| Hexachlorobutadiene | ND | 0.200 | " | | | | | | | |
| Hexachlorocyclopentadiene | ND | 1.00 | " | | | | | | | |
| Hexachloroethane | ND | 0.200 | " | | | | | | | |
| Indeno (1,2,3-cd) pyrene | ND | 0.200 | " | | | | | | | |
| Isophorone | ND | 0.200 | " | | | | | | | |
| 2-Methylnaphthalene | ND | 0.200 | " | | | | | | | |
| 2-Methylphenol | ND | 0.200 | " | | | | | | | |
| 3 & 4-Methylphenol | ND | 0.200 | " | | | | | | | |
| Naphthalene | ND | 0.200 | " | | | | | | | |
| 2-Nitroaniline | ND | 1.00 | " | | | | | | | |
| 3-Nitroaniline | ND | 1.00 | " | | | | | | | |
| 4-Nitroaniline | ND | 1.00 | " | | | | | | | |
| Nitrobenzene | ND | 0.200 | " | | | | | | | |
| 2-Nitrophenol | ND | 0.200 | " | | | | | | | |
| 4-Nitrophenol | ND | 1.00 | " | | | | | | | |
| N-Nitrosodiphenylamine | ND | 0.200 | " | | | | | | | |
| N-Nitrosodi-n-propylamine | ND | 0.200 | " | | | | | | | |
| Pentachlorophenol | ND | 1.00 | " | | | | | | | |
| Phenanthrene | ND | 0.200 | " | | | | | | | |
| Phenol | ND | 0.200 | " | | | | | | | |
| Pyrene | ND | 0.200 | " | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.200 | " | | | | | | | |
| 2,4,5-Trichlorophenol | ND | 0.200 | " | | | | | | | |
| 2,4,6-Trichlorophenol | ND | 0.200 | " | | | | | | | |
| *Surrogate: 2-FP* | *1.67* | | " | *1.67* | | *100* | *19-141* | | | |

North Creek Analytical - Bothell

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Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02005: Prepared 03/02/00 Using EPA 3550B** | | | | | | | | | | |
| **Blank (0C02005-BLK1)** | | | | | | | | | | |
| *Surrogate: Phenol-d6* | *1.72* | | *mg/kg wet* | *1.67* | | *103* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *1.54* | | " | *1.67* | | *92.2* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *1.49* | | " | *1.67* | | *89.2* | *33-108* | | | |
| *Surrogate: 2-FBP* | *1.68* | | " | *1.67* | | *101* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.03* | | " | *1.67* | | *122* | *48-149* | | | |
| **LCS (0C02005-BS1)** | | | | | | | | | | |
| Acenaphthene | 3.41 | 0.200 | mg/kg wet | 3.33 | | 102 | 48-110 | | | |
| 4-Chloro-3-methylphenol | 7.30 | 0.200 | " | 6.67 | | 109 | 34-115 | | | |
| 2-Chlorophenol | 6.68 | 0.200 | " | 6.67 | | 100 | 57-110 | | | |
| 1,4-Dichlorobenzene | 2.97 | 0.200 | " | 3.33 | | 89.2 | 39-110 | | | |
| 2,4-Dinitrotoluene | 3.53 | 1.00 | " | 3.33 | | 106 | 50-110 | | | |
| 4-Nitrophenol | 6.05 | 1.00 | " | 6.67 | | 90.7 | 26-116 | | | |
| N-Nitrosodi-n-propylamine | 3.39 | 0.200 | " | 3.33 | | 102 | 28-147 | | | |
| Pentachlorophenol | 6.69 | 1.00 | " | 6.67 | | 100 | 46-120 | | | |
| Phenol | 6.00 | 0.200 | " | 6.67 | | 90.0 | 35-110 | | | |
| Pyrene | 3.77 | 0.200 | " | 3.33 | | 113 | 35-143 | | | |
| 1,2,4-Trichlorobenzene | 3.26 | 0.200 | " | 3.33 | | 97.9 | 39-110 | | | |
| *Surrogate: 2-FP* | *1.58* | | " | *1.67* | | *94.6* | *19-141* | | | |
| *Surrogate: Phenol-d6* | *1.60* | | " | *1.67* | | *95.8* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *1.56* | | " | *1.67* | | *93.4* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *1.44* | | " | *1.67* | | *86.2* | *33-108* | | | |
| *Surrogate: 2-FBP* | *1.65* | | " | *1.67* | | *98.8* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *1.93* | | " | *1.67* | | *116* | *48-149* | | | |
| **Matrix Spike (0C02005-MS1)** | | | | | **Source: B0B0462-01** | | | | | |
| Acenaphthene | 8.40 | 0.200 | mg/kg dry | 4.92 | 2.84 | 113 | 34-122 | | | |
| 4-Chloro-3-methylphenol | 12.1 | 0.200 | " | 9.84 | ND | 123 | 26-129 | | | |
| 2-Chlorophenol | 8.89 | 0.200 | " | 9.84 | ND | 90.3 | 43-131 | | | |
| 1,4-Dichlorobenzene | 3.91 | 0.200 | " | 4.92 | ND | 79.5 | 34-131 | | | |
| 2,4-Dinitrotoluene | 8.47 | 1.00 | " | 4.92 | ND | 172 | 10-126 | | | Q-01 |
| 4-Nitrophenol | 8.62 | 1.00 | " | 9.84 | ND | 87.6 | 10-111 | | | |
| N-Nitrosodi-n-propylamine | 5.30 | 0.200 | " | 4.92 | ND | 108 | 29-160 | | | |
| Pentachlorophenol | 11.6 | 1.00 | " | 9.84 | ND | 118 | 46-120 | | | |
| Phenol | 8.62 | 0.200 | " | 9.84 | ND | 87.6 | 41-118 | | | |
| Pyrene | 6.16 | 0.200 | " | 4.92 | 0.786 | 109 | 44-122 | | | |

North Creek Analytical - Bothell

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Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Semivolatile Organic Compounds by EPA Method 8270C - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C02005: Prepared 03/02/00 Using EPA 3550B** | | | | | | | | | | |
| **Matrix Spike (0C02005-MS1)** | | | | | **Source: B0B0462-01** | | | | | |
| 1,2,4-Trichlorobenzene | 5.10 | 0.200 | mg/kg dry | 4.92 | ND | 104 | 10-176 | | | |
| *Surrogate: 2-FP* | *1.85* | | " | *2.46* | | *75.2* | *19-141* | | | |
| *Surrogate: Phenol-d6* | *2.32* | | " | *2.46* | | *94.3* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *1.87* | | " | *2.46* | | *76.0* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.26* | | " | *2.46* | | *91.9* | *33-108* | | | |
| *Surrogate: 2-FBP* | *2.57* | | " | *2.46* | | *104* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.81* | | " | *2.46* | | *114* | *48-149* | | | |
| **Matrix Spike Dup (0C02005-MSD1)** | | | | | **Source: B0B0462-01** | | | | | |
| Acenaphthene | 9.05 | 0.200 | mg/kg dry | 4.92 | 2.84 | 126 | 34-122 | 7.45 | 56 | Q-01 |
| 4-Chloro-3-methylphenol | 12.0 | 0.200 | " | 9.84 | ND | 122 | 26-129 | 0.830 | 29 | |
| 2-Chlorophenol | 10.3 | 0.200 | " | 9.84 | ND | 105 | 43-131 | 14.7 | 27 | |
| 1,4-Dichlorobenzene | 4.49 | 0.200 | " | 4.92 | ND | 91.3 | 34-131 | 13.8 | 23 | |
| 2,4-Dinitrotoluene | 9.10 | 1.00 | " | 4.92 | ND | 185 | 10-126 | 7.17 | 22 | Q-01 |
| 4-Nitrophenol | 8.95 | 1.00 | " | 9.84 | ND | 91.0 | 10-111 | 3.76 | 43 | |
| N-Nitrosodi-n-propylamine | 5.55 | 0.200 | " | 4.92 | ND | 113 | 29-160 | 4.61 | 25 | |
| Pentachlorophenol | 12.4 | 1.00 | " | 9.84 | ND | 126 | 46-120 | 6.67 | 29 | Q-01 |
| Phenol | 9.19 | 0.200 | " | 9.84 | ND | 93.4 | 41-118 | 6.40 | 29 | |
| Pyrene | 6.40 | 0.200 | " | 4.92 | 0.786 | 114 | 44-122 | 3.82 | 31 | |
| 1,2,4-Trichlorobenzene | 5.53 | 0.200 | " | 4.92 | ND | 112 | 10-176 | 8.09 | 24 | |
| *Surrogate: 2-FP* | *2.20* | | " | *2.46* | | *89.4* | *19-141* | | | |
| *Surrogate: Phenol-d6* | *2.32* | | " | *2.46* | | *94.3* | *44-128* | | | |
| *Surrogate: 2,4,6-TBP* | *2.75* | | " | *2.46* | | *112* | *10-137* | | | |
| *Surrogate: Nitrobenzene-d5* | *2.61* | | " | *2.46* | | *106* | *33-108* | | | |
| *Surrogate: 2-FBP* | *2.81* | | " | *2.46* | | *114* | *51-124* | | | |
| *Surrogate: p-Terphenyl-d14* | *2.92* | | " | *2.46* | | *119* | *48-149* | | | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C21019: Prepared 03/20/00 Using General Preparation** | | | | | | | | | | |
| **Blank (0C21019-BLK1)** | | | | | | | | | | |
| Total Organic Carbon - Average | ND | 300 | mg/kg wet | | | | | | | |
| **Blank (0C21019-BLK2)** | | | | | | | | | | |
| Total Organic Carbon - Average | ND | 300 | mg/kg wet | | | | | | | |
| **LCS (0C21019-BS1)** | | | | | | | | | | |
| Total Organic Carbon - Average | 2130 | 300 | mg/kg wet | 3820 | | 55.8 | 53.7-146 | | | |
| **LCS Dup (0C21019-BSD1)** | | | | | | | | | | |
| Total Organic Carbon - Average | 3270 | 300 | mg/kg wet | 3820 | | 85.6 | 53.7-146 | 42.2 | 30 | Q-07 |

North Creek Analytical - Bothell

Steve Davis, Project Manager

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| | | |
|---|---|---|
| Geo Engineers - Tacoma | Project: Bellingham Wood Treat | |
| 1101 Fawcett Ave., Ste 200 | Project Number: N/A | **Reported:** |
| Tacoma WA, 98402 | Project Manager: Sandra Smith | 03/22/00 14:25 |

## Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
## North Creek Analytical - Bothell

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 0C01029: Prepared 03/01/00 Using Dry Weight** | | | | | | | | | | |
| **Blank (0C01029-BLK1)** | | | | | | | | | | |
| Dry Weight | 100 | 1.00 | % | | | | | | | |

North Creek Analytical - Bothell

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| | | |
|---|---|---|
| Geo Engineers - Tacoma<br>1101 Fawcett Ave., Ste 200<br>Tacoma WA, 98402 | Project: Bellingham Wood Treat<br>Project Number: N/A<br>Project Manager: Sandra Smith | **Reported:**<br>03/22/00 14:25 |

## Notes and Definitions

| | |
|---|---|
| B | Analyte detected in the method blank. |
| Q-01 | The spike recovery for this QC sample is outside of established control limits. Review of associated batch QC indicates the recovery for this analyte does not represent an out-of-control condition for the batch. |
| Q-07 | The RPD value for this QC sample is above the established control limit. Review of associated QC indicates the high RPD does not represent an out-of-control condition for the batch. |
| Q-13 | Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect. |
| Q-15 | Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level. |
| S-05 | Due to interference from coeluting organic compounds with the primary surrogate, results of the secondary surrogate have been used to control the analysis. |
| 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 |
| RPD | Relative Percent Difference |

North Creek Analytical - Bothell

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# CHAIN OF CUSTODY RECORD

B01B0462

GEOENGINEERS, INC.
1101 FAWCETT, SUITE 200
TACOMA, WASHINGTON 98402
(206) 383-4940

Geo Engineers

DATE 2/29/00
PAGE 1 OF 1
LAB NCA
LAB NO.

PROJECT NAME/LOCATION Bellingham Wood Treat
PROJECT NUMBER
PROJECT MANAGER Sandy Smith
SAMPLED BY Sandy Smith

| SAMPLE IDENTIFICATION | | SAMPLE COLLECTION | | | # OF JARS | ANALYSIS REQUIRED | | | | | NOTES/COMMENTS (Preserved, filtered, etc.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LAB | GEOENGINEERS | DATE | TIME | MATRIX | | 8270 C | TAL by 6020 | Hg 3/1/00 | NWTPH-Dx | | |
| | BLOT-BS-01 | 2/29/00 | 18:15 | Sediment | 4 | X | X | | X | B01B0462-01 | Hold for Analyses |

| RELINQUISHED BY | FIRM | RELINQUISHED BY | FIRM | RELINQUISHED BY | FIRM |
|---|---|---|---|---|---|
| SIGNATURE Sandra B Smith | | SIGNATURE | | SIGNATURE | |
| PRINTED NAME Sandra B Smith | | PRINTED NAME | | PRINTED NAME | |
| DATE 2/29/00 TIME 21:03 | | DATE TIME | | DATE TIME | |
| **RECEIVED BY** | **FIRM** | **RECEIVED BY** | **FIRM** | **RECEIVED BY** | **FIRM** |
| SIGNATURE | ACT | SIGNATURE | | SIGNATURE | |
| PRINTED NAME L Parker | | PRINTED NAME | | PRINTED NAME | |
| DATE 2/29/00 TIME 21:03 | | DATE TIME | | DATE TIME | |

ADDITIONAL COMMENTS:

# EXHIBIT L-3
## ENSR Air Toxics Specialty Laboratory Analytical Report

Air Toxics Specialty Laboratory
325 Ayer Road
Harvard, MA 01451
(978) 772-2345
Fax: (978) 772-4956

# ENSR Air Toxics Specialty Laboratory
# Analytical Report

**Client:** Neil Morton
GEOENGINEERS
600 Stewart Street
Seattle, WA 98101

**Client ID: 0275-002-01 T1**

**Laboratory ID: 05-252**

**Date(s) Received: 8/24/05**

All work contained in this report has been done in accordance with laboratory standard operating procedures. ENSR's Air Toxics Specialty Laboratory follows methodologies based upon standard EPA/NIOSH/OSHA Methods. Data contained herein should be considered accurate and complete to the best of our knowledge. This report cannot be duplicated in part without the written permission of ENSR.

Christopher Philbrick
Senior Chemist
ENSR Air Toxics Specialty Laboratory

9/12/05
Date

NYSDOH / NELAC # 11631

## Case Narrative

Re: Volatile Organic Analysis of SUMMA® Canisters by Gas Chromatography/Mass Spectrometry (GC/MS) – **GEOENGINEERS**

PROJECT #: **0275-002-01 T1**

LAB ID #: **05-252**

ANALYTICAL PROCEDURE:

Eight (8) SUMMA® canister samples were analyzed under the guidelines of MADEP Draft Method 1.0; Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH).

A Hewlett Packard 6890 gas chromatograph equipped with a Hewlett Packard 5973 mass selective detector (MSD) was employed for the analysis. A Nutech 3550A/3600 automatic concentrator was utilized for pre-concentration.

A 250, 25 and 10-ml aliquot was drawn from each SUMMA® canister, concentrated at -160°C and then transferred to the GC/MSD for the analysis. The operating conditions of the GC/MSD are listed in Table 1.

GC/MSD calibration was performed with canister standards prepared for each target compound. Five to seven point calibrations were generated for each compound using these standards.

No problems occurred during sample receipt or login.

QUALITY CONTROL:

1. A laboratory blank was analyzed daily prior to sample analysis in the same manner as the samples. Target analytes were not detected in the blank.

2. A laboratory check standard (LCS) was analyzed with each batch of samples. All percent recoveries were within the laboratory's QC acceptance limits.

3. Sample [HS-SV-1 was analyzed in duplicate. The relative percent difference of 2-methyl naphthalene slightly exceeded the laboratory's QC acceptance limits. All other relative percent differences were within the laboratory's QC acceptance limits.

4. The SUMMA canisters for the samples were cleaned on 8/11/05 and were certified clean by the analysis of one canister (A100) from the cleaning batch.

5. The flow controllers for the samples were cleaned on 7/28/05 and 8/9/05 and were certified clean by the analysis of one flow controller (A019, A011) from each cleaning batch.

DISCUSSION:

1. Acetone and a siloxane isomer were present in sample [HS-SV-4]; these compounds elute in the C5-C8 aliphatic hydrocarbon range. These compounds were not included in the quantitation of the hydrocarbon range, since they are not petroleum hydrocarbons.

2. Pinene was present in samples [HS-SV-1] and [HS-SV-4]; this compound elutes in the C9-C12 aliphatic hydrocarbon range. This compound was not included in the quantitation of the hydrocarbon range, since it is not a petroleum hydrocarbon.

3. Due to concentrations of target and non-target compounds, which would have exceeded the calibrated range of the instrument and/or caused detector saturation if analyzed undiluted, all samples, with the exception of [HS-SV-1] and [HS-SV-4], were analyzed at a 10-fold to 25-fold dilution. Reporting limits and detected values have been adjusted accordingly. However, in some of the diluted samples the levels of various compounds (ethylbenzene, p&m-xylene, o-xylene, naphthalene and 2-methylnaphthalene) still exceeded the calibrated range of the instrument in the diluted analysis. Due to analytical limitations, a further dilution was not performed. These diluted values have been reported and flagged with an "E" and should be considered estimated.

**TABLE 1**

**GC/MSD Operating Conditions**

| | |
|---|---|
| Instrument | Hewlett Packard 6890 GC/ 5973 MSD |
| Column | Rtx-1 60 m Capillary |
| Parameters | 0.25mm ID, 1.0µm df |
| Carrier gas | UHP Helium; Flow rate = 2.0 cc/min |
| Detector | Mass Selective detector; Temperature: 240°C |
| Temperature program | Initial Temp.: 10°C Hold: 6.0 min |
| | Ramping Rate 1: 4.0°C/min |
| | Temp 1: 135°C Time 1: 0 min |
| | Ramping Rate 2 : 10°C/min |
| | Final Temp: 220°C Final Time: 1 min |
| Data System | HP ChemStation |

Date Analysis Started: 9/6/05

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-1 | Client Sample ID: | **HS-SV-1** |
| Laboratory ID: | 05-252 | Data File ID: | 090705_12.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 1.0 | Date & Time Analyzed: | 8 Sep 2005 1:31 am |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 3.1 | 0.97 |
| Toluene | 108-88-3 | 37 | 9.7 |
| Ethylbenzene | 100-41-4 | 3.3 | 0.75 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 12 | 2.8 |
| o-Xylene | 95-47-6 | 4.4 | 1.0 |
| Naphthalene | 91-20-3 | 10 | 2.0 |
| 2-Methylnaphthalene | 91-57-6 | 15 | 2.6 |
| C5-C8 Aliphatics | NA | 1,000 | |
| C9-C12 Aliphatics | NA | 1,100 | |
| C9-C10 Aromatics | NA | 150 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-2 | Client Sample ID: | **HS-SV-2** |
| Laboratory ID: | 05-252 | Data File ID: | 090805_08.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 10 | Date & Time Analyzed: | 8 Sep 2005 7:18 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 20 U | 9.0 U |
| Methyl t-butylether | 1634-04-4 | 20 U | 5.5 U |
| Benzene | 71-43-2 | 22 | 7.0 |
| Toluene | 108-88-3 | 85 | 23 |
| Ethylbenzene | 100-41-4 | 93 | 22 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 510 | 120 |
| o-Xylene | 95-47-6 | 140 | 33 |
| Naphthalene | 91-20-3 | 100 U | 19 U |
| 2-Methylnaphthalene | 91-57-6 | 100 U | 17 U |
| C5-C8 Aliphatics | NA | 780,000 | |
| C9-C12 Aliphatics | NA | 260,000 | |
| C9-C10 Aromatics | NA | 11,000 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-3 | Client Sample ID: | **HS-SV-3** |
| Laboratory ID: | 05-252 | Data File ID: | 090805_09.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 25 | Date & Time Analyzed: | 9 Sep 2005 9:59 am |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 50 U | 23 U |
| Methyl t-butylether | 1634-04-4 | 50 U | 14 U |
| Benzene | 71-43-2 | 97 | 30 |
| Toluene | 108-88-3 | 110 | 29 |
| Ethylbenzene | 100-41-4 | 8,200 E | 1,900 E |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 350 | 80 |
| o-Xylene | 95-47-6 | 190 | 44 |
| Naphthalene | 91-20-3 | 1,700 | 320 |
| 2-Methylnaphthalene | 91-57-6 | 250 U | 43 U |
| C5-C8 Aliphatics | NA | 1,600,000 | |
| C9-C12 Aliphatics | NA | 760,000 | |
| C9-C10 Aromatics | NA | 130,000 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-4 | Client Sample ID: | **HS-SV-4** |
| Laboratory ID: | 05-252 | Data File ID: | 090905_06.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 1.0 | Date & Time Analyzed: | 9 Sep 2005 5:32 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 3.0 | 0.94 |
| Toluene | 108-88-3 | 34 | 9.0 |
| Ethylbenzene | 100-41-4 | 8.3 | 1.9 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 18 | 4.1 |
| o-Xylene | 95-47-6 | 6.9 | 1.6 |
| Naphthalene | 91-20-3 | 14 | 2.7 |
| 2-Methylnaphthalene | 91-57-6 | 10 U | 1.7 U |
| C5-C8 Aliphatics | NA | 230 | |
| C9-C12 Aliphatics | NA | 230 | |
| C9-C10 Aromatics | NA | 40 U | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-5 | Client Sample ID: | **HS-SV-5** |
| Laboratory ID: | 05-252 | Data File ID: | 090905_07.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 10 | Date & Time Analyzed: | 9 Sep 2005 6:21 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 20 U | 9.0 U |
| Methyl t-butylether | 1634-04-4 | 20 U | 5.5 U |
| Benzene | 71-43-2 | 210 | 66 |
| Toluene | 108-88-3 | 140 | 38 |
| Ethylbenzene | 100-41-4 | 1,700 | 400 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 4,100 | 930 |
| o-Xylene | 95-47-6 | 3,300 E | 760 E |
| Naphthalene | 91-20-3 | 11,000 E | 2,100 E |
| 2-Methylnaphthalene | 91-57-6 | 1,600 E | 270 E |
| C5-C8 Aliphatics | NA | 920,000 | |
| C9-C12 Aliphatics | NA | 620,000 | |
| C9-C10 Aromatics | NA | 110,000 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-6 | Client Sample ID: | **HS-SV-6** |
| Laboratory ID: | 05-252 | Data File ID: | 090905_08.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 10 | Date & Time Analyzed: | 9 Sep 2005 7:11 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 20 U | 9.0 U |
| Methyl t-butylether | 1634-04-4 | 20 U | 5.5 U |
| Benzene | 71-43-2 | 65 | 20 |
| Toluene | 108-88-3 | 110 | 28 |
| Ethylbenzene | 100-41-4 | 1,200 | 270 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 980 | 230 |
| o-Xylene | 95-47-6 | 270 | 62 |
| Naphthalene | 91-20-3 | 26,000 E | 4,900 E |
| 2-Methylnaphthalene | 91-57-6 | 1,500 E | 260 E |
| C5-C8 Aliphatics | NA | 450,000 | |
| C9-C12 Aliphatics | NA | 980,000 | |
| C9-C10 Aromatics | NA | 180,000 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-7 | Client Sample ID: | **HS-SV-7** |
| Laboratory ID: | 05-252 | Data File ID: | 091205_07.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 10 | Date & Time Analyzed: | 12 Sep 2005 6:17 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 20 U | 9.0 U |
| Methyl t-butylether | 1634-04-4 | 20 U | 5.5 U |
| Benzene | 71-43-2 | 130 | 40 |
| Toluene | 108-88-3 | 230 | 62 |
| Ethylbenzene | 100-41-4 | 630 | 140 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 9,500 E | 2,200 E |
| o-Xylene | 95-47-6 | 5,400 E | 1,200 E |
| Naphthalene | 91-20-3 | 850 | 160 |
| 2-Methylnaphthalene | 91-57-6 | 120 | 21 |
| C5-C8 Aliphatics | NA | 1,100,000 | |
| C9-C12 Aliphatics | NA | 470,000 | |
| C9-C10 Aromatics | NA | 53,000 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## SUMMARY OF ANALYTICAL RESULTS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 05-252-8 | Client Sample ID: | **HS-SV-8** |
| Laboratory ID: | 05-252 | Data File ID: | 091205_08.D | Date Sampled: | 8/16/05 |
| Date Received: | 8/24/05 | Dilution Factor: | 10 | Date & Time Analyzed: | 12 Sep 2005 7:06 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 20 U | 9.0 U |
| Methyl t-butylether | 1634-04-4 | 20 U | 5.5 U |
| Benzene | 71-43-2 | 49 | 15 |
| Toluene | 108-88-3 | 52 | 14 |
| Ethylbenzene | 100-41-4 | 76 | 17 |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 140 | 32 |
| o-Xylene | 95-47-6 | 83 | 19 |
| Naphthalene | 91-20-3 | 410 | 77 |
| 2-Methylnaphthalene | 91-57-6 | 100 U | 17 U |
| C5-C8 Aliphatics | NA | 210,000 | |
| C9-C12 Aliphatics | NA | 55,000 | |
| C9-C10 Aromatics | NA | 1,600 | |

U = undetected at specified reporting limit
B= analyte detected in blank
E= value exceeded upper range of calibration
D = value obtained from diluted analysis

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | APH BLANK | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 090705_08.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 7 Sep 2005 9:47 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 2.0 U | 0.63 U |
| Toluene | 108-88-3 | 2.0 U | 0.53 U |
| Ethylbenzene | 100-41-4 | 2.0 U | 0.46 U |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 4.0 U | 0.92 U |
| o-Xylene | 95-47-6 | 2.0 U | 0.46 U |
| Naphthalene | 91-20-3 | 10 U | 1.9 U |
| 2-Methylnaphthalene | 91-57-6 | 10 U | 1.7 U |
| C5-C8 Aliphatics | NA | 40 U | |
| C9-C12 Aliphatics | NA | 40 U | |
| C9-C10 Aromatics | NA | 40 U | |

U = undetected at specified reporting limit

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | APH BLANK | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 090805_07.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 8 Sep 2005 6:28 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 2.0 U | 0.63 U |
| Toluene | 108-88-3 | 2.0 U | 0.53 U |
| Ethylbenzene | 100-41-4 | 2.0 U | 0.46 U |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 4.0 U | 0.92 U |
| o-Xylene | 95-47-6 | 2.0 U | 0.46 U |
| Naphthalene | 91-20-3 | 10 U | 1.9 U |
| 2-Methylnaphthalene | 91-57-6 | 10 U | 1.7 U |
| C5-C8 Aliphatics | NA | 40 U | |
| C9-C12 Aliphatics | NA | 40 U | |
| C9-C10 Aromatics | NA | 40 U | |

U = undetected at specified reporting limit

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | APH BLANK | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 090905_05.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 9 Sep 2005 3:02 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 2.0 U | 0.63 U |
| Toluene | 108-88-3 | 2.0 U | 0.53 U |
| Ethylbenzene | 100-41-4 | 2.0 U | 0.46 U |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 4.0 U | 0.92 U |
| o-Xylene | 95-47-6 | 2.0 U | 0.46 U |
| Naphthalene | 91-20-3 | 10 U | 1.9 U |
| 2-Methylnaphthalene | 91-57-6 | 10 U | 1.7 U |
| C5-C8 Aliphatics | NA | 40 U | |
| C9-C12 Aliphatics | NA | 40 U | |
| C9-C10 Aromatics | NA | 40 U | |

U = undetected at specified reporting limit

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-METHOD BLANK

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | APH BLANK | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 091205_05.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 12 Sep 2005 3:47 pm |

| Compound | CAS # | ug/m$^3$ | ppbV |
|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 0.90 U |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 0.55 U |
| Benzene | 71-43-2 | 2.0 U | 0.63 U |
| Toluene | 108-88-3 | 2.0 U | 0.53 U |
| Ethylbenzene | 100-41-4 | 2.0 U | 0.46 U |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 4.0 U | 0.92 U |
| o-Xylene | 95-47-6 | 2.0 U | 0.46 U |
| Naphthalene | 91-20-3 | 10 U | 1.9 U |
| 2-Methylnaphthalene | 91-57-6 | 10 U | 1.7 U |
| C5-C8 Aliphatics | NA | 40 U | |
| C9-C12 Aliphatics | NA | 40 U | |
| C9-C10 Aromatics | NA | 40 U | |

U = undetected at specified reporting limit

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-LCS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 10 ppbV APH LCS | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 090705_04.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 7 Sep 2005 6:03 pm |

| Compound | ug/m$^3$ | ppbV | True Value ug/m$^3$ | % Recovery |
|---|---|---|---|---|
| 1,3-Butadiene | 25 | 11 | 22 | 113% |
| Methyl t-butylether | 31 | 8.7 | 37 | 84% |
| Benzene | 30 | 9.3 | 32 | 93% |
| Toluene | 36 | 9.6 | 38 | 95% |
| Ethylbenzene | 40 | 9.2 | 44 | 91% |
| m&p-Xylenes | 80 | 19 | 88 | 91% |
| o-Xylene | 44 | 10 | 44 | 101% |

U = undetected at specified reporting limit

B= analyte detected in blank

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-LCS

Client: GEOENGINEERS / HALEY | Lab Sample ID: 10 ppbV APH LCS | Client Sample ID: N/A

Laboratory ID: 05-252 | Data File ID: 090805_03.D | Date Sampled: N/A

Date Received: N/A | Dilution Factor: 1.0 | Date & Time Analyzed: 8 Sep 2005 12:03 pm

| Compound | ug/m$^3$ | ppbV | True Value ug/m$^3$ | % Recovery |
|---|---|---|---|---|
| 1,3-Butadiene | 21 | 9.3 | 22 | 93% |
| Methyl t-butylether | 27 | 7.4 | 37 | 72% |
| Benzene | 27 | 8.5 | 32 | 84% |
| Toluene | 34 | 8.9 | 38 | 89% |
| Ethylbenzene | 40 | 9.3 | 44 | 92% |
| m&p-Xylenes | 76 | 17 | 88 | 86% |
| o-Xylene | 47 | 11 | 44 | 107% |

U = undetected at specified reporting limit

B= analyte detected in blank

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-LCS

| | | | | | |
|---|---|---|---|---|---|
| Client: | GEOENGINEERS / HALEY | Lab Sample ID: | 10 ppbV APH LCS | Client Sample ID: | N/A |
| Laboratory ID: | 05-252 | Data File ID: | 090905_03.D | Date Sampled: | N/A |
| Date Received: | N/A | Dilution Factor: | 1.0 | Date & Time Analyzed: | 9 Sep 2005 1:10 pm |

| Compound | ug/m$^3$ | ppbV | True Value ug/m$^3$ | % Recovery |
|---|---|---|---|---|
| 1,3-Butadiene | 21 | 9.3 | 22 | 93% |
| Methyl t-butylether | 31 | 8.5 | 37 | 83% |
| Benzene | 28 | 8.8 | 32 | 87% |
| Toluene | 35 | 9.4 | 38 | 93% |
| Ethylbenzene | 41 | 9.5 | 44 | 94% |
| m&p-Xylenes | 77 | 18 | 88 | 87% |
| o-Xylene | 43 | 9.9 | 44 | 98% |

U = undetected at specified reporting limit

B= analyte detected in blank

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-LCS

Client: GEOENGINEERS / HALEY | Lab Sample ID: 10 ppbV APH LCS | Client Sample ID: N/A

Laboratory ID: 05-252 | Data File ID: 091205_03.D | Date Sampled: N/A

Date Received: N/A | Dilution Factor: 1.0 | Date & Time Analyzed: 12 Sep 2005 1:55 pm

| Compound | ug/m$^3$ | ppbV | True Value ug/m$^3$ | % Recovery |
|---|---|---|---|---|
| 1,3-Butadiene | 24 | 11 | 22 | 109% |
| Methyl t-butylether | 36 | 9.9 | 37 | 97% |
| Benzene | 27 | 8.6 | 32 | 86% |
| Toluene | 35 | 9.2 | 38 | 91% |
| Ethylbenzene | 40 | 9.3 | 44 | 92% |
| m&p-Xylenes | 76 | 17 | 88 | 86% |
| o-Xylene | 42 | 9.8 | 44 | 96% |

U = undetected at specified reporting limit

B= analyte detected in blank

## ENSR AIR TOXICS SPECIALTY LABORATORY
## QUALITY CONTROL RESULTS-DUPLICATE ANALYSES

Client: GEOENGINEERS / HALEY | Lab Sample IDs: 05-252-1 05-252-1DP | Client Sample ID: HS-SV-1

Laboratory ID: 05-252 | Data File IDs: 090705_12.D 090705_13.D

Dilution Factor: 1.0 | Date & Time Analyzed: 8 Sep 2005 1:31 am 8 Sep 2005 2:29 am

| Compound | CAS # | ug/m$^3$ | ug/m$^3$ DUP | % RPD |
|---|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 2.0 U | 2.0 U | NC |
| Methyl t-butylether | 1634-04-4 | 2.0 U | 2.0 U | NC |
| Benzene | 71-43-2 | 3.1 | 3.1 | 0.0% |
| Toluene | 108-88-3 | 37 | 36 | 2.7% |
| Ethylbenzene | 100-41-4 | 3.3 | 3.0 | 9.5% |
| m&p-Xylenes | 108-38-3 & 106-42-3 | 12 | 12 | 0.0% |
| o-Xylene | 95-47-6 | 4.4 | 4.1 | 7.1% |
| Naphthalene | 91-20-3 | 10 | 10 U | NC |
| 2-Methylnaphthalene | 91-57-6 | 15 | 11 | 31% |
| C5-C8 Aliphatics | NA | 1,000 | 1,000 | 0.0% |
| C9-C12 Aliphatics | NA | 1,100 | 1,200 | 8.7% |
| C9-C10 Aromatics | NA | 150 | 160 | 6.5% |

U = undetected at specified reporting limit
B= analyte detected in blank
NC = not calculable

E= value exceeded upper range of calibration
D = value obtained from diluted analysis
RPD Limit = 30%

# CHAIN OF CUSTODY RECORD

ENSR INTERNATIONAL

Page 1 of 1

| | |
|---|---|
| Client/Project Name: GEOENGINEERS / HALEY | Project Location: 500 CORNWALL AVE, BELLINGHAM, WA |
| Project Number: 0275-002-01 T1 | Field Logbook No.: |
| Sampler (Print Name)/(Affiliation): MARCELLA RIPICH, GEI | Chain of Custody Tape No.: |
| Signature: | Send Results/Report to: GEOENGINEERS, 600 STEWART ST SEATTLE, WA NEIL MORTON |

Analysis Requested

| Field Sample No./ Identification | Date | Time | Grab | Comp | Sample Container (Can/Bag) | Canister I.D. | Regulator I.D. | Sample Type (Soil gas/ambient) | NAPHTHALENE | 2-METHYLNAPHTHALENE | C5-C8 ALIPHATICS | C9-C12 ALIPHATICS | C9-C10 AROMATICS by MA DEP APH METHOD | Lab I.D. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS-SV-1 | 8-16-05 | 1230 | | | CAN | C132 CP | A010 (?) | SOIL GAS | X | X | X | X | X | | 05-252-1 |
| HS-SV-2 | | 1115 | | | | 41 | A001 | | X | X | X | X | X | | 05-252-2 |
| HS-SV-3 | | 1500 | | | | A205 | A031 | | X | X | X | X | X | | 05-252-3 |
| HS-SV-4 | | 1250 | | | | 25 | A007 (3) | | X | X | X | X | X | | 05-252-4 |
| HS-SV-5 | | 1530 | | | | 4454 | A023 | | X | X | X | X | X | | 05-252-5 |
| HS-SV-6 | | 1400 | | | | A210 | A006 | | X | X | X | X | X | | 05-252-6 |
| HS-SV-7 | | 1330 | | | | C124 | A015 | | X | X | X | X | X | | 05-252-7 |
| HS-SV-8 | | 1430 | | | | 48 | A019 | SOIL GAS | X | X | X | X | X | | 05-252-8 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

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05-252

| | | | |
|---|---|---|---|
| Relinquished by: (print name) MARCELLA RIPICH | Date: 8-17-05 | Received by: (print name) | Date: |
| Signature: | Time: 1420 | Signature: | Time: |
| Relinquished by: (print name) | Date: | Received by: (print name) | Date: |
| Signature: | Time: | Signature: | Time: |
| Relinquished by: (print name) | Date: | Received for laboratory by: (print name) Christopher Mills | Date: 8/24/05 |
| Signature: | Time: | Signature: | Time: 11 15 |

Analytical Laboratory (Destination):

ENSR Air Laboratory
325 Ayer Rd
Harvard, MA 01451-1132
Phone: (978) 772-2345
Fax: (978) 772-4956

Serial No.

M2K0262.1001

# SAMPLE LOG-IN & RECEIPT CHECKLIST

Client/Proj# GeoEngineers / Haley / 0275-002-01T1

Project Mgr: Christopher Philbrick Lab Pool #: 05-252

Inspected & Logged in by: Christopher Philbrick Date & Time: 8/24/05 11:45

| Sample Matrix | Number of Samples | Analysis Requested | Hold Time & Due by(date) | Storage Location | Disposal Date* |
|---|---|---|---|---|---|
| SUMMA Cans | 8 | Select APH Compounds | HT: 9/13/05<br>Due: 9/7/05 | GCMS Lab | |
| | | | HT:<br>Due: | | |
| | | | HT:<br>Due: | | |

**Circle the appropriate response:** UPS #: 1Z 933 ØE5 12 4Ø63 5653
1Z 933 ØE5 03 4Ø11 1486

1) Shipped / Hand delivered

2) COC present / not present on receipt

3) COC Tape present / not present on shipping container

4) Samples broken / leaking / intact on receipt

5) Samples ambient / chilled on receipt

6) Samples preserved correctly / incorrectly / none recommended

7) Received within / outside holding time

8) COC tapes present / not present on samples

9) Discrepancies / NO discrepancies noted between COCs and samples

**Additional Comments:** CANISTER IDs were not filled out on the COC with the exception of canister 48 for sample HS Sr-8
Log in personnel filled & initial COC for Can IDs.

*= Note that all Canister samples will be considered disposed of during next cleaning.
For canister samples, please refer to Canister Log Book for details.

R:\Air_Tox\LAB\Lab forms\samplog.xls
Last Revised 5/30/03

# APPENDIX M
## Benthic Habitat Survey

# Table of Contents

# APPENDIX M
# BENTHIC HABITAT SURVEY

## 1.0 BENTHIC HABITAT SURVEY METHODOLOGY

GeoEngineers biologists conducted a benthic habitat survey between September 25 and 27, 2012. The primary goal of the survey was to identify the locations and extent of eelgrass at the site. Side-Scan Sonar (SSS) and SCUBA diving were conducted to accomplish the benthic survey. Visual observations of eelgrass locations and densities were made both during the SCUBA dive survey and from the vessel during low tide. This appendix describes the survey methodology.

### 1.1. Side-Scan Sonar

The SSS is an in-water imaging system which uses an acoustic oblique image similar to an aerial photograph. The SSS in conjunction with a global positioning system (GPS) and data reduction software produces an image that is built up of objects on the sea floor.

#### *1.1.1. Equipment*

Equipment used to acquire the SSS imagery consisted of:

- Boston Whaler acquisition vessel
- Independent Trimble PRO XH with NIMA string out at 9600 baud GPS
- EdgeTec 4125: Ultra High Resolution, dual frequency side-scan sonar imaging unit (towfish)
- EdgeTech's Discover acquisition software loaded on a Dell laptop computer
- Leraand Engineering, Inc. Sonar TRX data reduction software

#### *1.1.2. Track Lines*

Track lines are planned vessel paths across a site. The area imaged on either side of the track line is called a swath. The width of a swath is determined by the angle of the sonar within the towfish, the depth the towfish is towed, and the bottom depth. Track lines are designed so that there is approximately 50 percent overlap of associated swaths. This high percentage of overlap is required to image the narrow area directly below the towfish (nadir), which the towfish does not have the ability to "see."

#### *1.1.3. Calibration*

Calibration of the SSS was accomplished by performing a patch test. The patch test consisted of running the SSS over a known submerged target twice in opposite directions. The data from the Patch Test were then compared for positional accuracy and image calibration. The patch test also allowed for fine tuning of the swath width of the towfish. Positional accuracy for the purposes of this survey were considered acceptable with a +/- 1 foot between the patch test swaths. Towfish frequency, swath width, and ping rate (rate of sonar pulse transmission in "pings per second") used in the survey were 400 and 900 kHz with a swath width of 30 meters and a ping rate of 200 pings per second. This combination yielded a sonar resolution of 0.4 inches (29.6 pings per foot) at a boat speed of 4 knots.

#### *1.1.4. Planning*

The original survey design included three track lines; however, after running the patch test, it was determined that two tracks running parallel with approximately 40 feet of separation would yield 100 percent coverage of the desired area with greater than 50 percent overlap.

#### *1.1.5. Data Processing and Interpretation*

The process of combining all sonar files into a composite image using specialized software is known as "mosaicing." Distortions of data induced by fluctuations in vessel speed and tow depth are corrected during this process. Mosaics can be considered as images and are georeferenced raster image formats suitable for use within a GIS format. Classification and interpretation of the images was performed by GeoEngineers using an image truthing methodology. Areas of potential eelgrass identified during the survey were then observed from the surface vessel at low tide and by a diver.

### 1.2. Visual Assessment

The survey area was visually inspected from the vessel during low tide on September 26, 2012 to survey for visible macroalgae at the site. Moderate visibility of approximately two feet allowed for observation of eelgrass beds. Visual observations of eelgrass were then compared to the eelgrass distribution maps generated from SSS.

### 1.3. SCUBA Dive Survey

Two GeoEngineers biologists conducted SCUBA dive surveys along six transects. The surveys were conducted in general accordance with the Washington Department of Fish and Wildlife (WDFW) "Eelgrass/Macroalgae Habitat Interim Survey Guidelines" (WDFW 2008). Equipment used to conduct the eelgrass SCUBA dive survey included:

- Boston Whaler acquisition vessel
- 0.25 square meter weighted PVC frame
- Standard SCUBA apparatus with high pressure compressed air tanks
- OTS Guardian full-face masks with 2-way buddy phone communication

The extent of eelgrass within each transect was noted and eelgrass densities were assessed using a 0.25 square meter frame. The frame was placed in a representative portion of the eelgrass bed and the turions (1 turion is a clump of eelgrass) within the frame were counted. The turion count at each eelgrass density sampling location was then multiplied by four to estimate eelgrass density in turions/square meter. Results are discussed in Section 4.0.