Lower Duwamish Waterway Superfund Site

Terminal 117 Early Action Area

FIRST QUARTER 2008 INTERIM GROUNDWATER MONITORING DATA RESULTS – NON-TIME CRITICAL REMOVAL ACTION FINAL

Prepared for

The Port of Seattle
and
The City of Seattle
For submittal to:
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1 Introduction

This First Quarter 2008 Interim Groundwater Monitoring Data Results Report (Report) presents the objectives, methodologies, and results of the interim ground water monitoring activities preceding the Non-Time Critical Removal Actions (NTCRA), at the Terminal 117 (T-117) Early Action Area (EAA) of the Lower Duwamish Waterway (LDW) Superfund Site (Site) in Seattle, Washington (Figure 1). This report was prepared on behalf of the Port of Seattle (Port), and the City of Seattle (City) for submittal to the U.S. Environmental Protection Agency (EPA) in accordance with the *Statement of Work* amendment (SOW, EPA 2007) appended to the NTCRA Administrative Settlement Agreement and Order on Consent (Settlement Agreement) issued on December 22, 2005.

The investigation described herein was performed in accordance with the *Interim Groundwater Monitoring Plan* (Plan; ENSR 2008a) and the *Quality Assurance Project Plan-Non-Time Critical Removal Action – Preliminary Investigation and Interim Groundwater Monitoring Plan* (QAPP; ENSR 2008b) submitted on behalf of the Port and the City to EPA on March 4, 2008.

The Second Quarter 2008 Interim Groundwater monitoring event is planned for June 2008.

1.1 PURPOSE AND OBJECTIVES

The groundwater monitoring network at T-117 includes 10 wells as shown on Figure 2. The monitoring wells are located to provide specific information on the T-117 Upland groundwater (Table 1 in the *Interim Groundwater Monitoring Plan*, ENSR 2008a). Monitoring wells (MW-02 through MW-08) are located along the shoreline to assess the groundwater entering the LDW. Additionally, MW-02 and MW-06 are located downgradient of the highest historical PCB concentrations in contact with groundwater. The shoreline wells are spread out along the entire T-117 Upland shoreline border. Monitoring well MW-03 is located in the center of T-117 Upland near a historical industrial well. New monitoring wells MW-09 and MW-10 are generally upgradient and will assess the groundwater quality entering the site from Basin Oil.

The objectives of the Interim Groundwater Monitoring Plan as stated in the SOW are to:

- Determine if groundwater migrating onto the T-117 Upland contains contaminants at levels that have the potential to recontaminate the T-117 Upland area
- Determine if groundwater at the T-117 Upland contains contaminants at levels that have the potential to cause unacceptable human exposures or

cause contaminants to migrate into the LDW sediments (including any bank or sediment areas created as part of the NTCRA) at levels exceeding the Washington State Sediment Management Standards or Washington State Water Quality Standards.

This report presents all the data associated with the monitoring well installation, tidal study and First Quarter 2008 groundwater sampling event. This data has been collected in accordance with the SOW, the Plan, and the QAPP.

1.2 REPORT ORGANIZATION

This report is organized as follows:

- Section 1 describes the background and the purpose and objectives of the investigation
- Section 2 describes the methods and field procedures used to complete the investigation
- Section 3 provides details of the data quality assurance, management, and usability of the investigation
- Section 4 describes the results of the interim groundwater monitoring-first event investigation
- Section 5 summarizes the soil analytical results.
- Section 6 summarizes the groundwater analytical results
- Section 7 provides references cited in the report
- The appendices provide the monitoring well installation logs, monitoring well development logs, tidal study field data, groundwater monitoring and other field forms, permits, and laboratory and data validation reports.

2 Sampling Process, Methods and Field Procedures

The interim groundwater monitoring field work was performed on the schedule outlined below:

Table 1. Field Work Schedule

DATE	TASK PERFORMED
February 27-28, 2008	Well Installation
February 29, 2008	Well Development/Re-Development
March 4-6, 2008	Tidal Study
March 7, 2008	Re-Develop MW-7
March 10, 2008	Confirm Re-Development Complete
March 11-13, 2008	Collect Groundwater Samples

Well installation, well development, tidal study and groundwater monitoring activities were conducted in accordance with the Plan (ENSR 2008a) and the QAPP (ENSR 2008b).

2.1 WELL INSTALLATION

Three monitoring wells were installed to replace groundwater monitoring wells at the shoreline removed during the 2006 TCRA (MW-04R, MW-05R, and MW-08R), and two new monitoring wells were installed at the T-117 upgradient boundary along the Dallas Avenue ROW (MW-09 and MW-10), as shown on Figure 2. Monitoring wells were advanced and installed in accordance to the QAPP and the Plan. However, MW-09 and MW-10 locations were moved slightly west of the original locations due to overhead powerline interference with the drilling operations. MW-10 was moved an additional two feet west due to underground utilities observed during monitoring well advancement that were not identified by the Washington State "One Call" utility locate service (*see* Section 2.5). Soil samples were collected at 1.5 foot intervals during well installation and were analyzed as discussed in Section 5.0.

2.2 WELL DEVELOPMENT

The new monitoring wells were developed a minimum of 24 hours after installation in accordance with the QAPP. Additionally, existing monitoring wells MW-01, MW-03, and MW-07 were redeveloped, in accordance with the QAPP. Details are presented in Section 4.2. There were no deviations from the procedure outlined for well development in the QAPP during this activity.

2.3 TIDAL STUDY

A 48-hour tidal study was conducted from March 4-6, 2008 to determine if the monitoring wells were tidally affected and to determine the optimal groundwater

sample times. All ten monitoring wells in the groundwater monitoring network and a stilling well (located at the south end of the South Park Marina dock) were included in the 48-hour study to measure LDW tidal variation (Figure 2).

The tidal study was completed and conducted in accordance with the QAPP. However, the time in which the study was conducted was increased from 24 hours to 48 hours to allow for accurate observation of the lowering tide cycle. Section 4.3 and Appendix B discuss the results of the March 2008 tidal study.

2.4 GROUNDWATER SAMPLING

On March 11 through March 13, 2008 groundwater samples were collected from the five existing, three replacement, and two newly installed monitoring wells on the Site. MW-7 was re-sampled on April 18, 2008 to evaluate the validity of the original the results of the March 12, 2008 event.

All groundwater samples were collected in accordance with EPA-approved low-flow groundwater sampling techniques via peristaltic pump as described in the QAPP. All groundwater monitoring wells were purged until the aquifer stabilized according t the QAPP before groundwater samples were collected. See Section 4.1 for well stabilization details. Field notes detailing aquifer stabilization parameters can be found in Appendix C. All groundwater sample collection equipment was decontaminated between sample locations in accordance with the QAPP.

Monitoring wells located on the T-117 Upland are affected by the tidal cycles of the Lower Duwamish Waterway (LDW). Due to this, timing for the collection of groundwater samples is governed by the tides. A tidal study was conducted in 2003 by Windward and a second tidal study was conducted by ENSR in March 2008 (*see* Section 4.3.2). The results of the March 2008 tidal study were used to determine the timing of groundwater sampling in monitoring wells MW-02 through MW-08R.

MW-06 was the only well that went dry during groundwater sampling. This is related to a falling tide rather than purging to dryness. MW-06 was successfully sampled the following day at the beginning of the sampling window.

There were no deviations from the procedures outlined for collecting groundwater samples in the QAPP during this field activity.

2.5 ADDITIONAL FIELD PROCEDURES

Additional field procedures were conducted in accordance with all methods and procedures listed in the QAPP. These included: instrument/equipment calibration and maintenance; decontamination; sample handling and custody; sample packing and labeling; sample log-in; and inspection/acceptance of supplies and consumables.

In additional to the procedures listed in the QAPP, prior to the installation of the groundwater monitoring wells, all well locations were cleared for underground

utilities using Washington State's "One Call" utility locating service. The One Call service identified utilities located along public streets and right of ways.

3 Data Quality Assurance, Management, and Usability

This section discusses the quality assurance (QA) and management process for the analytical data collected during the well installation and interim groundwater monitoring. In addition to the discussion of the data QA process (which includes the analytical methodology and data validation), this section describes the content and usability of the data.

3.1 ANALYTICAL METHODS

3.1.1 Soil Analytical Methods

Soil samples were collected at 1.5-foot intervals with a 1.5-inch diameter split-spoon sampler. Soil samples were collected from the ground surface to 14 feet below ground surface (ft-bgs). Boring/well logs are included in Appendix A. The soil samples were classified and described in accordance with the QAPP, placed in laboratory supplied containers, put on ice and delivered for analysis to Analytical Resources Inc. (ARI), a Washington State Certified Laboratory. Soil samples were submitted for select analytical analysis, summarized below.

Table 2. Summary of Soil Analytical Methods

ANALYTE	METHOD	METHOD REPORTING LIMIT
PCBs	EPA 8082	0.80 mg/kg
Diesel Range Hydrocarbons	NWTPH-Dx	5 mg/kg
Lube Oil Range Hydrocarbons	NWTPH-Dx	10 mg/kg

Notes:
PCB – Polychlorinated Biphenyls
EPA – Environmental Protection Agency
NWTPH-Dx – Northwest analytical method for diesel and heavy oil range hydrocarbons
mg/kg – milligram per kilogram

3.1.2 Groundwater Analytical Methods

Groundwater samples were collected and analyzed from all ten monitoring wells in accordance with the QAPP and the Plan. All groundwater samples were submitted for analysis to ARI. Requested groundwater analysis is summarized below.

Table 3. Summary of Groundwater Analytical Methods

ANALYTE	METHOD	METHOD REPORTING LIMIT
PCBs	EPA 8082 Low Level	0.01 µg/L
Diesel Range Hydrocarbons	NWTPH-Dx	0.25 mg/L
Lube Oil Range Hydrocarbons	NWTPH-Dx	0.50 mg/L
Gasoline Range Hydrocarbons	NWTPH-Gx	0.25 mg/L
Total Suspended Solids	EPA 160.2	1 mg/L
Semi-Volatile Organic Compounds (SVOCs) including Polycyclic Aromatic Hydrocarbons (PAHs)	EPA 8270D and EPA 8270D SIM	0.1 µg/L for PAHs, 0.1 to 10 µg/L for other SVOCs
Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	NWTPH-Gx/EPA 8021	1,000 µg/L
Volatile Organic Compounds (VOCs)	EPA 8260B	0.2 to 5 µg/L depending on analyte
Metals	6010B – Ag, As, Be, Cd, Cr, Cu, Ni, Pd, Se, Sb, Ti, Zn; 7470 – Hg	0.1 to 50 µg/L depending on metal

Notes:
PCB – Polychlorinated Biphenyls
EPA – Environmental Protection Agency
NWTPH-Dx – Northwest analytical method for diesel and heavy oil range hydrocarbons
NWTPH-Gx – Northwest analytical method for gasoline range hydrocarbons
µg/L – microgram per Liter
mg/L – milligrams per Liter
Ag-Silver; As – Arsenic; Be – Beryllium; Cd – Cadmium; Cr – Chromium; Cu-Copper; Ni – Nickel; Pd – Palladium; Se – Selenium; Sb – Antimony; Ti – Thallium; Zn – Zinc; Hg – Mercury

3.2 DATA VALIDATION

All data validation followed the guidelines provided in EPA's *Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-04-009, January 2005 (EPA 2005c), as they applied to the reported methodology.

A Level 4 CLP-like fully validated data package (EPA 1991) was generated and the data was validated and qualified using the control limits specified in Table 1-1 of the QAPP. Data validation reports for the investigation are included in Appendix E. In these reports, conclusions regarding data validation criteria (accuracy, precision, completeness, and method compliance) are provided.

3.2.1 Soil Data Validation Results

Data validation is the process of reviewing and accepting, qualifying, or rejecting data on the basis of established criteria. Precision, accuracy, method compliance, and

completeness of the data set have been determined to be acceptable, based on the data submitted. There were no rejected data points associated with this data set. The reported data are suitable for their intended use with the qualifications and clarifications noted in the Data Validation Report for Soil, found in Appendix E.

3.2.2 Groundwater Data Validation Results

Precision, accuracy, method compliance, and completeness of the data set have been determined to be acceptable, based on the data submitted. None of the data from this investigation are being rejected. The Data Validation Report for Groundwater can be found in Appendix E.

The QA Officer reviewed field notebooks, laboratory report, and results of the data validation to determine if the Data Quality Objectives (DQO) had been met. The usability of the data depends on the magnitude of the DQO exceedance; data that has been rejected has been flagged as "R" and maintained in the database, but will not be used in any decision making. All of the data collected for the Investigation Report are considered usable.

4 Field Results

4.1 WELL INSTALLATION

Three replacement wells (MW-04R, MW-05R, and MW-08R) and two new groundwater monitoring wells (MW-09 and MW-10) were installed on February 27-28, 2008. Well locations are shown in Figure 2. The completion details of all monitoring wells on site are summarized below. Copies of field forms are included in Appendix C.

Table 4. Monitoring Well Details

WELL ID	NORTHING	EASTING	TOC ELEVATION MLLW	SURFACE ELEVATION MLLW	SCREENED INTERVAL (FT-BGS)
MW-01	195296.3657	1275296.941	21.87	22.09	5-15
MW-02	195347.51	1275518.55	15.48	15.855	4.25-14.25
MW-03	195477.519	1275394.665	16.45	16.741	1.5-11.5
MW-04R	195661.809	1275342.79	18.86	19.19	4-14
MW-05R	195541.824	1275433.99	17.33	17.68	5-15
MW-06	195425.761	1275502.07	16.32	16.518	5-15
MW-07	195734.1446	1275130.851	19.85	20.247	10-20
MW-08R	195713.021	1275271.02	19.40	19.69	9-19
MW-09	195472.421	1275223.403	23.40	23.85	5-15
MW-10	195387.319	1275270.011	22.83	23.17	5-15

Notes:

MW-1, MW-4R, MW-5R, MW-8R, MW-9, and MW-10 were surveyed in March 2008, elevations in MLLW

MW-2, MW-3, MW-6, MW-7 were converted from NAVD88 to MLLW using the LDW conversion (by adding 2.42 ft) http://www.nws.usace.army.mil/PublicMenu/Documents/Reg/applications/tides/np/np92.cfm

TOC – Top of Casing

MLLW – Mean Low Low Water Datum

ft-bgs – feet below ground surface

4.2 WELL DEVELOPMENT

The new monitoring wells were developed a minimum of 24 hours after installation in accordance with the QAPP. Additionally, existing monitoring wells MW-01, MW-03, and MW-07 were redeveloped in accordance with the QAPP. MW-01 and MW-03 had small amounts of sediment accumulation in the bottom of each well. The initial measured bottom of MW-07 was several feet above the reported total well depth. When re-developed, MW-07 had approximately 5.73 feet of sediment accumulation at the bottom of the well. The sediment was successfully removed from each of the three wells during re-development, prior to groundwater sampling.

4.3 TIDAL STUDY

A 48-hour tidal study was conducted March 4-6, 2008. The primary purpose of this tidal study was to determine the effect of tidal variations from the LDW on groundwater at the Site. The results of the tidal study were used to determine the most accurate times to collect groundwater samples to: a) ensure samples are representative of the aquifer and not river water from the LDW; and b) provide consistency from sampling event to sampling event.

Table 5 provides a summary of the recommended groundwater sample times for each well at the site based on the results of the tidal study. The sample times were chosen during low negative tide, at the point of maximum drawdown in a given well, to allow for sampling when the groundwater gradient is toward the LDW. This approach is consistent with previous groundwater sampling events and designed to capture water drawn from the surrounding aquifer as opposed to the LDW (Windward, DOF, Onsite 2003c; Windward, DOF, Onsite 2005b; RETEC 2006).

Two monitoring wells went dry during the tidal study, MW-03 and MW-04R. The sample times were modified for these two wells so that ample groundwater was available to collect samples for analysis. Recommended sample time, based on the tidal study, was before the well went dry or before the lowest low tide. Figure 3 illustrates the net groundwater flow results from the tidal study. Appendix B contains complete analysis and results of the 48-hour tidal study.

4.4 GROUNDWATER MONITORING FIELD PARAMETERS

Stabilized field parameters measured during the First Quarter 2008 groundwater sampling event are summarized below. This section discusses the results of each field parameter in detail in Table 6.

Table 5. Summary of Tidal Study Results

Table 6. Stabilized Field Parameters

Well	Sample Date	Field Parameters						
		Time	Temperature	pH	Conductivity	Dissolved Oxygen	ORP	Turbidity
	Units:		(°C)	pH units	(µS/cm)	(mg/L)	(mV)	(NTU)
MW-1	3/11/2008	11:40	11.81	6.08	0.46	0.83	79.0	1.79
MW-2	3/11/2008	16:12	11.53	6.45	0.42	1.34	48.3	3.12
MW-3	3/11/2008	14:10	13.59	6.47	0.34	1.43	-43.9	0
MW-4R	3/11/2008	13:53	9.71	7.28	12.57	5.66	198.5	9.5
MW-5R	3/11/2008	16:25	9.49	8.31	2.95	9.27	49.5	0.00
MW-6	3/13/2008	14:09	10.89	6.53	3.58	6.32	164.9	7.24
MW-7	3/12/2008	14:36	12.22	6.10	0.13	5.33	162.7	2.04
MW-8R	3/12/2008	16:45	8.76	8.84	12.55	7.85	67.7	1.26
MW-9	3/12/2008	13:20	13.21	6.11	0.45	5.67	232.4	1.04
MW-10	3/11/2008	11:28	11.07	5.51	0.33	0.65	154.3	1.53
Sitewide Minimum			8.76	5.51	0.13	0.65	-43.90	0.00
Sitewide Maximum			13.59	8.84	12.57	9.27	232.40	9.50
Sitewide Mean			11.30	6.46	0.46	5.50	116.65	1.66

Notes:
Stabilized field parameters are the last measured values before collecting groundwater samples.
°C – degrees Celsius
µS/cm – microSiemens per centimeter
mg/L – milligrams per Liter
mV – millivolts
NTU – Nephelometric Turbidity Units

4.4.1 pH

The mean pH of groundwater across the Site during the reporting period was 6.46, with a minimum value of 5.51, and a maximum value of 8.84. The minimum value was detected in MW-10 and the maximum value was detected in MW-8.

4.4.2 Conductivity

The mean conductivity (µS/cm) of groundwater across the Site during the reporting period was 0.46, with a minimum value of 0.13, and a maximum value of 12.57. The maximum value was detected in MW-4R; the minimum value was detected in MW-7.

4.4.3 Temperature

The mean temperature (^{o}C) of groundwater across the Site during the reporting period was 11.30 with a minimum value of 8.76 and a maximum value of 13.59. The temperature fluctuation varies seasonally. The maximum value was detected in MW-3 in and the minimum value was detected in MW-8.

4.4.4 Dissolved Oxygen

The typical dissolved oxygen (DO) concentration in groundwater is between 0 mg/L and 10 mg/L, which is equal to the saturation index of dissolved oxygen in water. The mean DO concentration in groundwater across the Site during the reporting period was 5.50 mg/L, with a minimum value of 0.65 mg/L (MW-10), and a maximum value of 9.27 mg/L (MW-5).

4.4.5 Oxidation-Reduction Potential

The mean oxidation-reduction potential (ORP) in groundwater across the Site during the reporting period was 116.65mV, with a minimum value of -43.90, and a maximum value of 232.40 mV. Negative ORP values indicate reducing conditions. Only one well, MW-3, had a negative ORP value during aquifer stabilization prior to groundwater sampling. The negative ORP value may be related to detections of TPH in the groundwater collected out of this well, even though no visual or olfactory observations of hydrocarbons were identified.

4.4.6 Turbidity

The mean turbidity in monitoring wells across the Site during the reporting period was 1.66 NTU with a minimum value of 0.0 and a maximum value of 9.50.

5 Well Installation Soil Analytical Results

Soil samples were collected from the three replacement monitoring wells (MW-04R, MW-05R, and MW-08R) and the two newly installed monitoring wells (MW-09 and MW-10). Soil samples were collected at 1.5 foot intervals, and were analyzed for PCBs and TPH (diesel and motor oil range). Soil analytical results from the well installation are presented in Table 7 and in Appendix F soil analytical results are presented alongside laboratory flags and validation qualifiers.

5.1 POLYCHLORINATED BIPHENYLS (PCBS)

Table 7 shows the analytical results for PCBs in soil. Arochlor© 1260 was the only PCB detected. Total PCB concentrations ranged from non-detect (all five borings had at least one depth interval that was non-detect) to 4.2 mg/kg in MW-05R (at 10-11.5 feet below ground surface [ft-bgs]). Soil collected from MW-04R, MW-05R, MW-09, and MW-10 had total PCBs concentrations above the MTCA Method A Cleanup Level for unrestricted land use of 1 mg/kg. Soil results from MW-08R were below the screening level at all depth intervals.

5.2 TOTAL PETROLEUM HYDROCARBONS (TPH)

Table 7 shows the TPH analytical results for soils. Total TPH concentrations in the five borings ranged from non-detect (MW-09 and MW-10 at select depth intervals) to 45,000 mg/kg at MW-05R (at 5.0 to 6.5 ft-bgs). Motor oil-range hydrocarbons were below 2,000 mg/kg (MTCA Method A Cleanup Level for unrestricted land use) with the exception of selected samples from borings MW-04R and MW-05R. Diesel-range hydrocarbons were below 500 mg/kg with the exception of one sample from MW-05R. The 5.0 to 6.5 ft-bgs sample from MW-05R had a concentration of 9,000 mg/kg, exceeding the 2,000 mg/kg MTCA Method A Cleanup Level for unrestricted land use. TPH concentrations are roughly collocated with PCB concentrations; all three soil samples with TPH concentrations exceeding action levels also exceed the PCB action level.

Table 7. T-117 First Quarter 2008 Soil Results

6 Groundwater Analytical Results

This section presents the results from the first quarter 2008 groundwater sampling event conducted between March 11 and March 13, 2008 and a re-sampling event on April 18, 2008. Groundwater samples were collected from all ten groundwater monitoring wells and were analyzed for PCBs, TPH, PAHs and SVOCs, VOCs, BTEX, total and dissolved metals. Groundwater analytical results were compared to the Washington Administrative Code (WAC) Chapter 173-201 Water Quality Standards for Surface Waters of the State of Washington.

Table 8 presents the analytical results from the March 2008 groundwater sampling event, Table 9 summarizes the detected constituents in samples collected since 2003. Appendix E contains the results from historical groundwater sampling events. Appendix F presents the analytical results from the March 2008 groundwater sampling event alongside the laboratory flags and validation qualifiers.

6.1 POLYCHLORINATED BIPHENYLS (PCBS)

Aroclor© 1260 was the only PCB detected in groundwater at the Site since 2003. During the March 2008 sampling, Aroclor© 1260 was detected in the groundwater from MW-03 (2.0 µg/L), MW-05R (0.057 µg/L), and MW-06 (0.082 µg/L). Detections of Aroclor© 1260 are above the PCB screening level of 0.03 µg/L (WAC Chapter 173-201 Water Quality Standards for Surface Waters of the State of Washington). Groundwater results for total PCBs are below the laboratory detection limit for the remaining wells.

Historically, Aroclor© 1260 has been detected above the screen level of 0.03 µg/L in monitoring wells MW-03 and MW-05/05R. Historical concentrations have been similar, or higher than the results of the March 2008 sampling event.

MW-06 had a detection of Aroclor© 1260 (0.082 µg/L) during the March 2008 sampling event above the screening level. This is the second time the well has been sampled for total PCBs since the 1999 soil removal. Aroclor© 1260 was detected during the August 2006 at a concentrations of 0.02 µg/L. Detections of total PCB will be monitored at this well during the next quarterly sampling event to determine trends.

MW-07 was sampled on March 12 and re-sampled on April 18, 2008. The results of the March 12 sampling event are suspected to be anomalous; PCB was detected above the laboratory detection limit for the first time since the well has been sampled (detected at 0.036 µg/L). Historically (since 2003), PCB has not been reported above the laboratory detection limit in this well. Furthermore, the monitoring well is located in an area of the site with low to non-detect soil concentrations of PCB. The results of the April 18 re-sampling event are below the laboratory detection limit for all PCBs, consistent with the historical groundwater data. Future groundwater sampling will provide further indication whether the March 12, 2008 result in MW-07 is suspect.

Table 8. T-117 First Quarter 2008 Groundwater Results

Table 9. T-117 Groundwater Detections 2003 – Present

Groundwater results from MW-02, MW-07, and MW-08/08R have historically been below laboratory reporting level, or detected below the screen level of 0.03 µg/L.

6.2 TOTAL PETROLEUM HYDROCARBONS (TPH)

During the March 2008 sampling event two monitoring wells, MW-02 and MW-03, reported detections of TPH. Diesel range hydrocarbons were detected at MW-02 (0.7 mg/L) and MW-03 (4.2 mg/L). Motor oil range hydrocarbons were detected at MW-03 (3.3 mg/L). Gasoline range hydrocarbons were not detected in the groundwater in any of the 10 monitoring wells sampled. Detections during the March 2008 sampling event are consistent, or lower, than historic groundwater sample results. While results are lower, they continue to exceed the MTCA Method A Cleanup Level for unrestricted land use (0.5 mg/L). TPH will be monitored in future groundwater sampling events to assess TPH levels in groundwater at the Site.

6.3 POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) AND SEMIVOLATILE ORGANIC COMPOUNDS (SVOCS)

PAHs including chrysene, acenaphthene, naphthalene, pyrene, and fluorene were detected in MW-02, MW-03, and MW-05R. All detected PAHs were below the screening levels, with the exception of Chrysene, which was detected in MW-03 (0.5 µg/L) above the screening level of 0.018 µg/L.

Historically, PAHs were not detected above each analyte's respective reporting limit in any well with the exception of MW-03. During the May 2003 event PAHs were detected in the groundwater from MW-02, MW-03, and MW-05R. Similar to the March 2008 result, chrysene is the only PAH detected above the screening level of 0.018 µg/L (May 2003, 0.1 µg/L). 1-Methylnaphthalene was also detected in MW-02 (0.19 µg/L); no screening level is available for this PAH.

Bis(2-Ethylhexyl)phthalate is the only other SVOCs reported during the March 2008 groundwater sampling event. Bis(2-Ethylhexyl)phthalate was detected in MW-01, MW-03, MW-06, MW-08R, and MW-10 ranging from 1.1 µg/L (MW-08R) to 2.0 µg/L (MW-03). None of these reported detections are above the screening level of 2.2 µg/L.

6.4 VOLATILE ORGANIC COMPOUNDS (VOCS)

Of the 67 VOCs analyzed for, 7 VOCs were detected in the groundwater from MW-02, MW-03, MW-05R, MW-07, MW-09 and MW-10. All detected VOCs are below their respective screening level. VOC detections are summarized below:

- Acetone – MW-03 (7.7 µg/L), MW-05R (3.5 µg/L), and MW-07 (3.8 µg/L)
- Chlorobenzene – MW-02 at a concentration of 0.4 µg/L
- Cis-1,2-Dichloroethene MW-10 at a concentration of 1.2 µg/L

- Tetrachloroethene – MW-09 and MW-10 at a concentration of 1.0 µg/L and 2.0 µg/L, respectively
- Trichloroethene – MW-10 at a concentration of 0.5 µg/L
- Xylenes (m-, p-, and o-xylenes) – MW-03 at a concentration of 0.7 µg/L (m- and p-xylenes) and 0.3 µg/L (o-xylene).

VOCs have not historically been analyzed for in groundwater. The detections of tetrachloroethene and trichloroethene in MW-09 and MW-10 and not is wells located farther downgradient suggest an upgradient source of chlorinated solvents.

6.5 PRIORITY POLLUTANT METALS

Chromium (total), copper (total and dissolved), silver (total and dissolved) and zinc (total) were detected in the groundwater from 8 of the 10 monitoring wells. None of the detected metals, total or dissolved, exceed their respective screening levels.

7 References

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Appendix A

Well Boring Logs

Appendix B

Tidal Study

Appendix C

Field Forms

Appendix D

Utility Permit

Appendix E

Historical Analytical Data and First Quarter 2008 Laboratory and Data Validation Reports

(NOTE: Provided on attached CD-ROM)

Appendix F

First Quarter 2008 Groundwater and Soil Results Tables with Lab and Applied Validation Qualifiers

(NOTE: Provided on attached CD-ROM)

Table 5. Summary of Tidal Study Results

Well ID	Elevation (Average from 1st low low to 2nd low low)	Tidal Range (48 hrs)	Tidal Efficiency (Quarter Cycle)	Average Lag Time (Low Tides Only)	Suggested Sample Collection Time	Rationale	Actual sample time 3/11/08-3/13/08	Applicable Low Low Tide 3/11/08-3/13/08	Sample time relative to tide 3/11/08-3/13/08	Notes
	MLLW	ft	% of channel	hr:min	hr:min		Day hr:min	Day hr:min	hr:min	
MW-01	13.03	0	0%	NA	Anytime	Not tidally influenced	3/11/08 11:40	NA	NA	
MW-02	7.76	4.41	37%	2:16	2:15 after low tide	Low water level	3/11/08 16:30	3/11/08 14:41	1:49	
MW-03	**7.19**	**4.56**	**39%**	**1:43**	0:45 after low tide (well goes dry)	Low water level before well goes dry	3/11/08 14:10	3/11/08 14:41	-0:31	well went dry during sampling
MW-04R	**7.43**	**3.18**	**27%**	**2:05**	1:45 before low tide (well goes dry)	Low water level before well goes dry	3/11/08 14:15	3/11/08 14:41	-0:26	
MW-05R	7.61	5.54	47%	2:23	2:25 after low tide	Low water level	3/11/08 16:30	3/11/08 14:41	1:49	
MW-06	7.00	5.98	51%	1:07	1:05 after low tide	Low water level	3/13/08 14:30	3/13/08 16:27	-1:57	well went dry during sampling
MW-07	NA	NA	NA	0:33*	0:30 after low tide	Low water level	3/12/08 14:45	3/12/08 15:31	-0:46	well redeveloped between tidal study and sampling event
MW-08R	7.28	7.61	64%	0:40	0:40 after low tide	Low water level	3/12/08 16:45	3/12/08 15:31	1:14	
MW-09	9.07	0.03	0%	NA	Anytime	Not tidally influenced	3/12/08 13:20	NA	NA	
MW-10	9.42	0.02	0%	NA	Anytime	Not tidally influenced	3/11/08 11:45	NA	NA	
Stilling Well	6.54	11.8	100%	0:00	NA	NA	NA	NA	NA	

Bold values include extrapolated figures for wells that went dry

* average of high tides only

NA - not applicable

Table 7. T-117 First Quarter 2008 Soil Results

Location ID	Sample ID	Sample Date	Sample Type	Start Depth	End Depth	Depth Interval Unit	Analyte Unit / Elevation (mllw)	Aroclor 1016 mg/kg	Aroclor 1221 mg/kg	Aroclor 1232 mg/kg	Aroclor 1254 mg/kg	Aroclor 1260 mg/kg	Aroclor-1242 mg/kg	Aroclor-1248 mg/kg	Total PCBs mg/kg	Diesel Range Hydrocarbons mg/kg	Motor Oil Range Hydrocarbons mg/kg	Total TPH mg/kg
MW-4R	MW-4R-0.5-2.0	2/28/2008		0.5	2	ft	19.19	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	**29**	**300**	**329**
MW-4R	MW-4R-2.5-4.0	2/28/2008		2.5	4	ft	19.19	< 0.57	< 0.57	< 0.57	< 0.57	**3.80**	< 0.57	< 0.57	**3.8**	**370**	**2,500**	**2,870**
MW-4R	MW-4R-5.0-6.5	2/28/2008		5	6.5	ft	19.19	< 0.032	< 0.032	< 0.032	< 0.032	**0.044**	< 0.032	< 0.032	**0.044**	< 110	**520**	**520**
MW-4R	MW-4R-7.5-9.0	2/28/2008		7.5	9	ft	19.19	< 0.032	< 0.032	< 0.032	< 0.032	**0.053**	< 0.032	< 0.032	**0.053**	< 110	**580**	**580**
MW-4R	MW-4R-10.0-11.5	2/28/2008		10	11.5	ft	19.19	< 0.032	< 0.032	< 0.032	< 0.032	**0.048**	< 0.032	< 0.032	**0.048**	< 110	**790**	**790**
MW-4R	MW-4R-12.5-14.0	2/28/2008		12.5	14	ft	19.19	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 120	**510**	**510**
MW-5	MW-5-0.5-2.0	2/27/2008		0.5	2	ft	17.68	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	**7.1**	**70**	**71.7**
MW-5	MW-5-2.5-4.0	2/27/2008		2.5	4	ft	17.68	< 0.17	< 0.17	< 0.17	< 0.17	**0.59**	< 0.17	< 0.17	**0.59**	< 52	**390**	**390**
MW-5	MW-5-5.0-6.5	2/27/2008		5	6.5	ft	17.68	< 0.33	< 0.33	< 0.33	< 0.33	**2.40**	< 0.33	< 0.33	**2.4**	**9,000**	**36,000**	**45,000**
MW-5	MW-5-7.5-9.0	2/27/2008		7.5	9	ft	17.68	< 0.27	< 0.27	< 0.27	< 0.27	**1.50**	< 0.27	< 0.27	**1.5**	**430**	**4,000**	**4,430**
MW-5	MW-5-10.0-11.5	2/27/2008		10	11.5	ft	17.68	< 0.56	< 0.56	< 0.56	< 0.56	**4.20**	< 0.56	< 0.56	**4.2**	**230**	**990**	**1220**
MW-5	MW-05-12.5-14.0	2/27/2008		12.5	14	ft	17.68	< 0.032	< 0.032	< 0.032	< 0.032	**0.120**	< 0.032	< 0.032	**0.12**	**12**	**46**	**58**
MW-8	MW-08-0.5-2.0	2/28/2008		0.05	2	ft	19.69	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 100	**460**	**460**
MW-8	MW-08-2.5-4.0	2/28/2008		2.5	4	ft	19.69	< 0.032	< 0.032	< 0.032	< 0.032	**0.046**	< 0.032	< 0.032	**0.046**	**25**	**150**	**175**
MW-8	MW-08-5.0-6.5	2/28/2008		5	6.5	ft	19.69	< 0.032	< 0.032	< 0.032	< 0.032	**0.063**	< 0.032	< 0.032	**0.063**	< 280	**1,600**	**1,600**
MW-8	DUP-01-022808	2/28/2008	FD	7.5	9	ft	19.69	< 0.032	< 0.032	< 0.032	< 0.032	**0.052**	< 0.032	< 0.032	**0.052**	< 110	**390**	**390**
MW-8	MW-08-7.5-9.0	2/28/2008		7.5	9	ft	19.69	< 0.032	< 0.032	< 0.032	< 0.032	**0.053**	< 0.032	< 0.032	**0.053**	< 110	**530**	**530**
MW-8	MW-08-10.0-11.5	2/28/2008		10	11.5	ft	19.69	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 110	**470**	**470**
MW-8	MW-08-12.5-14.0	2/28/2008		12.5	14	ft	19.69	< 0.032	< 0.032	< 0.032	< 0.032	**0.16 J**	< 0.032	< 0.032	**0.16 J**	< 120	**340**	**340**
MW-9	MW-09-0.5-2.0	2/27/2008		0.5	2	ft	23.85	< 0.55	< 0.55	< 0.55	< 0.55	**1.40**	< 0.55	< 0.55	**1.4**	**18**	**180**	**198**
MW-9	MW-09-2.5-4.0	2/27/2008		2.5	4	ft	23.85	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 5.8	**24**	**24**
MW-9	MW-09-5.0-6.5	2/27/2008		5	6.5	ft	23.85	< 0.033	< 0.033	< 0.033	< 0.033	**0.055**	< 0.033	< 0.033	**0.055**	< 6	**16**	**16**
MW-9	MW-09-7.5-9.0	2/27/2008		7.5	9	ft	23.85	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 0.032	< 5.6	< 11	< 11
MW-9	MW-09-10.0-11.5	2/27/2008		10	11.5	ft	23.85	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 6.2	**14**	**14**
MW-9	MW-09-12.5-14.0	2/27/2008		12.5	14	ft	23.85	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 0.033	< 5.3	< 11	< 11
MW-10	MW-10-0.5-2.0	2/28/2008		0.5	2	ft	23.17	< 0.1	< 0.1	< 0.1	< 0.1	**0.40**	< 0.1	< 0.1	**0.4**	**73**	**520**	**593**
MW-10	MW-10-2.5-4.0	2/28/2008		2.5	4	ft	23.17	< 0.29	< 0.29	< 0.29	< 0.29	**1.50**	< 0.29	< 0.29	**1.5**	< 58	**380**	**380**
MW-10	MW-10-5.0-6.5	2/28/2008		5	6.5	ft	23.17	< 0.16	< 0.16	< 0.16	< 0.16	**0.54**	< 0.16	< 0.16	**0.54**	< 5.7	**13**	**13**
MW-10	DUP-02-022808	2/28/2008	FD	7.5	9	ft	23.17	< 0.033	< 0.033	< 0.033	< 0.033	**0.14**	< 0.033	< 0.033	**0.14**	< 5.5	< 11	< 11
MW-10	MW-10-7.5-9.0	2/28/2008		7.5	9	ft	23.17	< 0.033	< 0.033	< 0.033	< 0.033	**0.10**	< 0.033	< 0.033	**0.1**	< 5.5	**15**	**15**
MW-10	MW-10-10.0-11.5	2/28/2008		10	11.5	ft	23.17	< 0.033	< 0.033	< 0.033	< 0.033	**0.053**	< 0.033	< 0.033	**0.053**	< 5.8	< 12	< 12
MW-10	MW-10-12.5-14.0	2/28/2008		12.5	14	ft	23.17	< 0.032	< 0.032	< 0.032	< 32	< 0.032	< 0.032	< 0.032	< 0.032	< 5.6	< 11	< 11

Bold - Detecticated with +) and low (indicated with -) bias based on lab QC results
< - Non Detect at the Reporting limit shown.
FD - Field Duplicate
J - Estimated concentration with possible high (indicated with +) and low (indicated with -) bias based on lab QC results
ft - feet

Table 8. T-117 First Quarter 2008 Groundwater Results

Location ID Sample ID Sample Date Sample Type				MW-01 MW-1-0308 3/11/2008	MW-02 MW-2-0308 3/11/2008	MW-03 MW-3-0308 3/11/2008	MW-04R MW-4R-0308 3/11/2008	MW-05 MW-5-0308 3/11/2008	MW-06 MW-6-0308 3/13/2008	MW-07 MW-7-0308 3/12/2008	MW-07* MW-7-041808 4/18/2008	MW-08 MW-8-0308 3/12/2008	MW-09 DUP-1-0308 3/11/2008 Duplicate	MW-09 MW-9-0308 3/12/2008	MW-10 MW-10-0308 3/11/2008
Analyte	**Total or Dissolved**	**Unit**	**Screening level**												
EPA 160.2															
Total Suspended Solids	NV	mg/L	NV	**1.2**	**9**	**82.5**	**2.1**	**72.6**	**7.7**	< 1.1	< 2.2	**5.5**	< 2.1	< 1.1	< 1
NWTPH-Dx															
Diesel Range Hydrocarbons	NV	mg/L	0.5	< 0.25	**0.7**	**4.2**	< 0.25	< 0.25	< 0.25	< 0.25	NA	< 0.25	< 0.25	< 0.25	< 0.25
Motor Oil Range Hydrocarbons	NV	mg/L	0.5	< 0.5	< 0.5	**3.3**	< 0.5	< 0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
Gasoline Range Hydrocarbons	NV	mg/L	0.5	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	NA	< 0.25	< 0.25	< 0.25	< 0.25
SW6010B / SW7470A (Priority Pollutant Metals)															
Antimony	D	mg/l	0.64	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Antimony	T	mg/l	0.64	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	D	mg/l	0.00014	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	T	mg/l	0.00014	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Beryllium	D	mg/l	NV	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium	T	mg/l	NV	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	NA	< 0.001	< 0.001	< 0.001	< 0.001
Cadmium	D	mg/L	0.42	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	NA	< 0.002	< 0.002	< 0.002	< 0.002
Cadmium	T	mg/L	0.42	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	NA	< 0.002	< 0.002	< 0.002	< 0.002
Chromium	D	mg/L	NV	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	NA	< 0.005	< 0.005	< 0.005	< 0.005
Chromium	T	mg/L	NV	< 0.005	< 0.005	**0.006**	**0.006**	< 0.005	< 0.005	< 0.005	NA	< 0.005	< 0.005	< 0.005	< 0.005
Copper	D	mg/L	0.48	< 0.002	**0.002**	< 0.002	**0.003**	< 0.002	**0.006**	< 0.002	NA	**0.002**	< 0.002	**0.003**	**0.004**
Copper	T	mg/L	0.48	**0.002**	**0.004**	**0.01**	**0.004**	< 0.002	**0.007**	< 0.002	NA	**0.004**	**0.003**	**0.003**	**0.005**
Lead	D	mg/L	0.21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NA	< 0.02	< 0.02	< 0.02	< 0.02
Lead	T	mg/L	0.21	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	NA	< 0.02	< 0.02	< 0.02	< 0.02
Mercury	D	mg/L	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	NA	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Mercury	T	mg/L	0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	NA	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	D	mg/L	4.6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	< 0.01	< 0.01	< 0.01	< 0.01
Nickel	T	mg/L	4.6	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	< 0.01	< 0.01	< 0.01	< 0.01
Selenium	D	mg/L	4.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Selenium	T	mg/L	4.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Silver	D	mg/L	0.0019	< 0.003	< 0.003	< 0.003	**0.004**	< 0.003	< 0.003	< 0.003	NA	**0.003**	< 0.003	< 0.003	< 0.003
Silver	T	mg/L	0.0019	< 0.003	< 0.003	< 0.003	**0.003**	< 0.003	**0.003**	< 0.003	NA	**0.005**	< 0.003	< 0.003	< 0.003
Thallium	D	mg/L	0.00047	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Thallium	T	mg/L	0.00047	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	NA	< 0.05	< 0.05	< 0.05	< 0.05
Zinc	D	mg/L	26	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NA	< 0.01	< 0.01	< 0.01	< 0.01
Zinc	T	mg/L	26	< 0.01	< 0.01	**0.01**	< 0.01	< 0.01	< 0.01	< 0.01	NA	< 0.01	< 0.01	< 0.01	< 0.01
EPA 8021B (BTEX)															
Benzene	NV	µg/L	51	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Ethylbenzene	NV	µg/L	2100	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
o-Xylene	NV	µg/L	NV	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Toluene	NV	µg/L	15000	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Xylene (meta & para)	NV	µg/L	NV	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
EPA 8082 (PCBs)															
Aroclor 1016	NV	µg/L	0.03	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor 1221	NV	µg/L	NV	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.015	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor 1232	NV	µg/L	NV	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.012	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor 1254	NV	µg/L	0.03	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor 1260	NV	µg/L	0.03	< 0.01	< 0.01	**2**	< 0.01	**0.057**	**0.082**	**0.036**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor-1242	NV	µg/L	NV	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aroclor-1248	NV	µg/L	NV	< 0.01	< 0.01	< 0.011	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Analyte	Total or Dissolved	Unit	Location ID Sample ID Sample Date Sample Type Screening level	MW-01 MW-1-0308 3/11/2008	MW-02 MW-2-0308 3/11/2008	MW-03 MW-3-0308 3/11/2008	MW-04R MW-4R-0308 3/11/2008	MW-05 MW-5-0308 3/11/2008	MW-06 MW-6-0308 3/13/2008	MW-07 MW-7-0308 3/12/2008	MW-07* MW-7-041808 4/18/2008	MW-08 MW-8-0308 3/12/2008	MW-09 DUP-1-0308 3/11/2008 Duplicate	MW-09 MW-9-0308 3/12/2008	MW-10 MW-10-0308 3/11/2008
EPA 8260B (VOCs)															
1,1,1,2-Tetrachloroethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1,1-Trichloroethane	NV	µg/L	NV	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2	< 0.2 J	NA	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J
1,1,2,2-Tetrachloroethane	NV	µg/L	4	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichloroethane	NV	µg/L	16	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1,2-Trichlorotrifluoroethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloroethene	NV	µg/L	7100	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,1-Dichloropropene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,2,3-Trichlorobenzene	NV	µg/L	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
1,2,3-Trichloropropane	NV	µg/L	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
1,2,4-Trichlorobenzene	NV	µg/L	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
1,2,4-Trimethylbenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dibromo-3-chloropropane	NV	µg/L	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dibromoethane (EDB)	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	NV	µg/L	1300	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichloroethane	NV	µg/L	37	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2	< 0.2 J	NA	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J
1,2-Dichloropropane	NV	µg/L	15	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,3,5-Trimethylbenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	NV	µg/L	960	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichloropropane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
1,4-Dichlorobenzene	NV	µg/L	190	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
2,2-Dichloropropane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
2-Chloroethylvinylether	NV	µg/L	NV	< 1	< 1	< 1	< 1	< 1	< 0.2	< 1	NA	< 1	< 1	< 1	< 1
2-Chlorotoluene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
2-Hexanone	NV	µg/L	NV	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 1	< 2.5	NA	< 2.5	< 2.5	< 2.5	< 2.5
4-Chlorotoluene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
4-Isopropyltoluene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Acetone	NV	µg/L	NV	< 3	< 3	**7.7**	< 3	**3.5**	< 1	**3.8**	NA	< 3	< 3	< 3	< 3
Acrolein	NV	µg/L	290	< 5	< 5	< 5	< 5	< 5	< 1	< 5	NA	< 5	< 5	< 5	< 5
Acrylonitrile	NV	µg/L	0.25	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Benzene	NV	µg/L	51	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromobenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromochloromethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane	NV	µg/L	17	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromoethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromoform	NV	µg/L	140	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Bromomethane	NV	µg/L	1500	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Disulfide	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Carbon Tetrachloride	NV	µg/L	1.6	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2	< 0.2 J	NA	< 0.2 J	< 0.2 J	< 0.2 J	< 0.2 J
Chlorobenzene	NV	µg/L	1600	< 0.2	**0.4**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2 J	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Chloroform	NV	µg/L	470	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Chloromethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
cis-1,2-Dichloroethene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	**1.2**
cis-1,3-Dichloropropene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Dibromochloromethane	NV	µg/L	13	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Dibromomethane	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Dichloromethane	NV	µg/L	590	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	NV	µg/L	2100	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobutadiene	NV	µg/L	18	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
Iodomethane	NV	µg/L	NV	< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Isopropylbenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
Methyl ethyl ketone	NV	µg/L	NV	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 1	< 2.5	NA	< 2.5	< 2.5	< 2.5	< 2.5
Methyl isobutyl ketone	NV	µg/L	NV	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 1	< 2.5	NA	< 2.5	< 2.5	< 2.5	< 2.5
Naphthalene	NV	µg/L	NV	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 1	< 0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
n-Propylbenzene	NV	µg/L	NV	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	NV	µg/L	NV	< 0.2	< 0.2	**0.3**	< 0.2	< 0.2	< 0.2	< 0.2	NA	< 0.2	< 0.2	< 0.2	< 0.2

Location ID				MW-01		MW-02		MW-03		MW-04R		MW-05		MW-06		MW-07		MW-07*	MW-08		MW-09		MW-09		MW-10	
Sample ID				MW-1-0308		MW-2-0308		MW-3-0308		MW-4R-0308		MW-5-0308		MW-6-0308		MW-7-0308		MW-7-041808	MW-8-0308		DUP-1-0308		MW-9-0308		MW-10-0308	
Sample Date				3/11/2008		3/11/2008		3/11/2008		3/11/2008		3/11/2008		3/13/2008		3/12/2008		4/18/2008	3/12/2008		3/11/2008		3/12/2008		3/11/2008	
Sample Type																					Duplicate						
Analyte	Total or Dissolved	Unit	Screening level																								
sec-Butylbenzene	NV	µg/L	NV	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
Styrene	NV	µg/L	NV	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
tert-Butylbenzene	NV	µg/L	NV	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
Tetrachloroethene	NV	µg/L	3.3	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2		**0.9**		**1**		**2**	
Toluene	NV	µg/L	15000	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
trans-1,2-Dichloroethene	NV	µg/L	10000	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
trans-1,3-Dichloropropene	NV	µg/L	NV	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2	<	0.2 J	NA	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	
trans-1,4-Dichloro-2-butene	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Trichloroethene	NV	µg/L	30	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2		**0.5**	
Trichlorofluoromethane	NV	µg/L	NV	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2	<	0.2 J	NA	<	0.2 J	<	0.2 J	<	0.2 J	<	0.2 J	
Vinyl Acetate	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Vinyl Chloride	NV	µg/L	2.4	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	NA	<	0.2	<	0.2	<	0.2	<	0.2	
Xylene (meta & para)	NV	µg/L	NV	<	0.4	<	0.4		**0.7**	<	0.4	<	0.4	<	0.4	<	0.4	NA	<	0.4	<	0.4	<	0.4	<	0.4	
EPA 8270D (SVOCs)																											
1,2,4-Trichlorobenzene	NV	µg/L	70	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
1,2-Dichlorobenzene	NV	µg/L	1300	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
1,3-Dichlorobenzene	NV	µg/L	960	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
1,4-Dichlorobenzene	NV	µg/L	190	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2,2'-Oxybis(1-Chloropropane)	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2,4,5-Trichlorophenol	NV	µg/L	3600	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2,4,6-Trichlorophenol	NV	µg/L	2.4	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2,4-Dichlorophenol	NV	µg/L	290	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2,4-Dimethylphenol	NV	µg/L	850	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2,4-Dinitrophenol	NV	µg/L	5300	<	10 J	<	10 J	<	10 J	<	10 J	<	10 J	<	10 J	<	10 J	NA	<	10 J	<	10 J	<	10 J	<	10 J	
2,4-Dinitrotoluene	NV	µg/L	3.4	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2,6-Dinitrotoluene	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2-Chloronaphthalene	NV	µg/L	1600	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2-Chlorophenol	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2-Methylphenol	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
2-Nitroaniline	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
2-Nitrophenol	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
3,3'-Dichlorobenzidine	NV	µg/L	0.03	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
3-Nitroaniline	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
4,6-Dinitro-o-cresol	NV	µg/L	NV	<	10	<	10	<	10	<	10	<	10	<	10	<	10	NA	<	10	<	10	<	10	<	10	
4-Bromophenyl phenyl ether	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
4-Chloro-3-methylphenol	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
4-Chloroaniline	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
4-Chlorophenyl phenyl ether	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
4-Methylphenol	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
4-Nitroaniline	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
4-NITROPHENOL	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
Benzoic Acid	NV	µg/L	NV	<	10	<	10	<	10	<	10	<	10	<	10	<	10	NA	<	10	<	10	<	10	<	10	
Benzyl Alcohol	NV	µg/L	NV	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
bis(2-chloroethoxy)methane	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
bis(2-chloroethyl)ether	NV	µg/L	0.53	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
bis(2-Ethylhexyl)phthalate	NV	µg/L	2.2		**1.4**	<	1		**2**	<	1	<	1		**1.5**	<	1	NA		**1.1**		**1.1**	<	1		**1.2**	
Butyl benzyl phthalate	NV	µg/L	1900	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Carbazole	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Diethyl phthalate	NV	µg/L	44000	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Dimethyl phthalate	NV	µg/L	1100000	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Di-n-butyl phthalate	NV	µg/L	4500	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Di-n-Octyl phthalate	NV	µg/L	NV	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Hexachlorobenzene	NV	µg/L	0.00029	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Hexachlorobutadiene	NV	µg/L	18	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Hexachlorocyclopentadiene	NV	µg/L	1100	<	5	<	5	<	5	<	5	<	5	<	5	<	5	NA	<	5	<	5	<	5	<	5	
Hexachloroethane	NV	µg/L	3.3	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Isophorone	NV	µg/L	960	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	
Nitrobenzene	NV	µg/L	690	<	1	<	1	<	1	<	1	<	1	<	1	<	1	NA	<	1	<	1	<	1	<	1	

Analyte	Total or Dissolved	Unit	Screening level	Location ID Sample ID Sample Date Sample Type	MW-01 MW-1-0308 3/11/2008	MW-02 MW-2-0308 3/11/2008	MW-03 MW-3-0308 3/11/2008	MW-04R MW-4R-0308 3/11/2008	MW-05 MW-5-0308 3/11/2008	MW-06 MW-6-0308 3/13/2008	MW-07 MW-7-0308 3/12/2008	MW-07* MW-7-041808 4/18/2008	MW-08 MW-8-0308 3/12/2008	MW-09 DUP-1-0308 3/11/2008 Duplicate	MW-09 MW-9-0308 3/12/2008	MW-10 MW-10-0308 3/11/2008
N-Nitroso-Di-N-Propylamine	NV	µg/L	0.51		< 5	< 5	< 5	< 5	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 5
N-Nitrosodiphenylamine	NV	µg/L	6		< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
Pentachlorophenol	NV	µg/L	3		< 5	< 5	< 5	< 5	< 5	< 5	< 5	NA	< 5	< 5	< 5	< 5
Phenol	NV	µg/L	1700000		< 1	< 1	< 1	< 1	< 1	< 1	< 1	NA	< 1	< 1	< 1	< 1
EPA 8270D SIM (PAHs)																
1-Methylnaphthalene	NV	µg/L	NV		< 0.1	**0.19**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	NV	µg/L	NV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	NV	µg/L	990		< 0.1	< 0.1	< 0.1	< 0.1	**0.31**	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	NV	µg/L	NV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	NV	µg/L	40000		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	NV	µg/L	NV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	NV	µg/L	0.018		< 0.1	< 0.1	**0.5**	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	NV	µg/L	NV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	NV	µg/L	140		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	NV	µg/L	5300		< 0.1	< 0.1	< 0.1	< 0.1	**0.1**	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	NV	µg/L	0.018		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Naphthalene	NV	µg/L	NV		< 0.1	< 0.1	**0.19**	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	NV	µg/L	NV		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	NV	µg/L	4000		< 0.1	< 0.1	**0.33**	< 0.1	< 0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	< 0.1	< 0.1

Red - Detected value that exceeds screening level
Bold - Detected Result
< - Non Detect at the Reporting limit shown.
FD - Field Duplicate
J - Estimated concentration with possible high (indicated with +) and low (indicated with -) bias based on lab QC results
NV - No established value
TPH/NWTPH screening levels obtained from the MTCA Method A Cleanup Level for unrestricted land use
PCBs screening levels are obtained from the Surface Water ARAR - Aquatic Life - Marine/Chronic - National Toxics Rule, 40 CFR 131
Cadium, Copper, Lead, and Silver screening levels are obtained from the WAC Chapter 173-201A-Aquatic Life - Marine/Acute Water Quality Standards for Surface Waters of the State of Washington
All other groundwater screening levels were obtained from the Surface Water ARAR - Human Health – Marine – Clean Water Act §304
NA- Not Analyzed
* MW-07 was re-sampled on April 18, 2008 to verify results of the March 12, 2008 event.

Table 9. T-117 Groundwater Detections 2003 – Present (T117 Groundwater — 2003-2008 Detected Analytes Only)

Chemical Name	Total/ Dissolved	Unit	Action Level	Action Level Unit	Location ID / Sample ID / Sample Date / Sample Type	MW-01 SP-MW1 5/8/2003 N	MW-01 MW-1-0308 3/11/2008 N	MW-02 SP-MW2 5/8/2003 N	MW-02 T117-MW2 1/13/2004 N	MW-02 T117-MW-2 6/22/2005 N	MW-02 MW-2-0806 8/10/2006 N	MW-02 MW-2-0308 3/11/2008 N	MW-03 SP-MW3 5/8/2003 N	MW-03 MW-3-0308 3/11/2008 N	MW-04 SP-MW4 5/8/2003 N	MW-04 T117-MW-4 1/14/2004 N	MW-04 T117-MW-4 6/22/2005 N	MW-04 MW-4-0806 8/11/2006 N	MW-04R MW-4R-0308 3/11/2008 N	MW-05 T117-MW5-2 1/14/2004 N	MW-05 T117-MW-5 6/20/2005 N	T117-SB-3 MW-5-0806 8/10/2006 N	MW-05 T117-MW5-20 1/26/2006 N
Metals																							
Arsenic	D	mg/L	0.00014	mg/L		NA	NA	NA	NA	NA	**0.082**	NA	NA	NA	NA	NA	NA	**0.00066**	NA	NA	NA	**0.00129**	NA
Arsenic	T	mg/L	0.00014	mg/L		NA	NA	NA	NA	NA	**0.0903**	NA	NA	NA	NA	NA	NA	**0.00065**	NA	NA	NA	**0.004**	NA
Cadmium	D	mg/L	0.42	mg/L		NA	NA	NA	NA	NA	< 0.011	NA	NA	NA	NA	NA	NA	**0.000518**	NA	NA	NA	**0.000289**	NA
Cadmium	T	mg/L	0.42	mg/L		NA	NA	NA	NA	NA	**0.000123**	NA	NA	NA	NA	NA	NA	**0.000482**	NA	NA	NA	**0.000375**	NA
Chromium	T	mg/L	NV	—		NA	< 0.005	NA	NA	NA	**0.00393**	< 0.005	NA	**0.006**	NA	NA	NA	**0.00128**	**0.006**	NA	NA	**0.00307**	NA
Chromium	D	mg/L	NV	—		NA	NA	NA	NA	NA	**0.00304**	NA	NA	NA	NA	NA	NA	**0.00123**	NA	NA	NA	**0.0017**	NA
Copper	D	mg/L	0.48	mg/L		NA	< 0.002	NA	NA	NA	NA	**0.002**	NA	< 0.002	NA	NA	NA	NA	**0.003**	NA	NA	NA	NA
Copper	T	mg/L	0.48	mg/L		NA	**0.002**	NA	NA	NA	NA	**0.004**	NA	**0.01**	NA	NA	NA	NA	**0.004**	NA	NA	NA	NA
Lead	T	mg/L	0.21	mg/L		NA	NA	NA	NA	NA	**0.000027**	NA	NA	NA	NA	NA	NA	< 0.000036	NA	NA	NA	< 0.000034	NA
Silver	D	mg/L	NV	—		NA	< 0.003	NA	NA	NA	NA	< 0.003	NA	< 0.003	NA	NA	NA	NA	**0.004**	NA	NA	NA	NA
Silver	T	mg/L	0.0019	mg/L		NA	< 0.003	NA	NA	NA	NA	< 0.003	NA	< 0.003	NA	NA	NA	NA	**0.003**	NA	NA	NA	NA
Zinc	T	mg/L	26	mg/L		NA	< 0.01	NA	NA	NA	NA	< 0.01	NA	**0.01**	NA	NA	NA	NA	< 0.01	NA	NA	NA	NA
NWTPH																							
Diesel Range Hydrocarbons	T	mg/L	0.5	mg/L		NA	< 0.25	NA	NA	NA	NA	**0.7**	NA	**4.2**	NA	NA	NA	NA	< 0.25	NA	NA	NA	NA
Motor Oil Range Hydrocarbons	T	mg/L	0.5	mg/L		NA	< 0.5	NA	NA	NA	NA	< 0.5	NA	**3.3**	NA	NA	NA	NA	< 0.5	NA	NA	NA	NA
TPH - Diesel Range	T	mg/L	0.5	mg/L		< 0.26	NA	< 0.26	NA	**0.5**	**0.94**	NA	**0.7**	NA	< 0.3	NA	NA	< 0.25	NA	NA	NA	< 0.25	NA
TPH - Lube Oil Range	T	mg/L	NV	—		< 0.42	NA	< 0.42	NA	NA	NA	NA	**1.4**	NA	< 0.48	NA	NA	NA	NA	NA	NA	NA	NA
SW8082																							
PCBs (total calc'd)	T	µg/L	0.03	µg/L		< 0.051	NA	< 0.05	< 1	< 0.16	**0.01 J**	NA	< 0.053	NA	< 0.051	< 1	< 0.06	< 0.01 J	NA	< 1	**0.04 J**	**0.029 J**	**0.32**
Aroclor 1260	T	µg/L	0.03	µg/L		**< 0.051**	< 0.01	**< 0.05**	**< 1**	**< 0.04**	**0.01 J**	< 0.01	**< 0.053**	**2**	**< 0.051**	**< 1**	**< 0.04**	< 0.01 J	< 0.01	**< 1**	**0.04 J**	**0.029 J**	**0.32**
SW8260B																							
Acetone	T	µg/L	NV	—		NA	< 3	NA	NA	NA	NA	< 3	NA	**7.7**	NA	NA	NA	NA	< 3	NA	NA	NA	NA
Chlorobenzene	T	µg/L	1600	µg/L		NA	< 0.2	NA	NA	NA	NA	**0.4**	NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA
cis-1,2-Dichloroethene	T	µg/L	NV	—		NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA
Tetrachloroethene	T	µg/L	3.3	µg/L		NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA
Trichloroethene	T	µg/L	30	µg/L		NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA
Total Xylenes (calc'd)	T	µg/L	NV	—		< 1	NA	< 1	< 1	NA	NA	NA	**1.3**	NA	< 1	< 1	NA	NA	NA	< 1	NA	NA	NA
o-Xylene	T	µg/L	NV	—		NA	< 0.2	NA	NA	NA	NA	< 0.2	NA	**0.3**	NA	NA	NA	NA	< 0.2	NA	NA	NA	NA
Xylene (meta & para)	T	µg/L	NV	—		< 1	< 0.4	< 1	< 1	NA	NA	< 0.4	**1.3**	**0.7**	< 1	< 1	NA	NA	< 0.4	< 1	NA	NA	NA
SW8270D SIM																							
Total HPAH (calc'd)	T	µg/L	NV	—		< 0.099	NA	< 0.096	< 1.1	< 0.2 J	< 1	NA	**0.1**	NA	< 0.11	< 1.1	NA	< 1	NA	< 1	NA	< 1	NA
Total LPAH (calc'd)	T	µg/L	NV	—		< 0.099	NA	< 0.096	< 1.1	< 0.2	< 1	NA	**2**	NA	< 0.11	< 1.1	NA	< 1	NA	< 1	NA	< 1	NA
Total PAH (calc'd)	T	µg/L	NV	—		< 0.099	NA	< 0.096	< 1.1	< 0.2 J	< 1	NA	**2.1**	NA	< 0.11	< 1.1	NA	< 1	NA	< 1	NA	< 1	NA
1-Methylnaphthalene	T	µg/L	NV	—		< 0.099	< 0.1	< 0.096	NA	NA	NA	**0.19**	**0.15**	< 0.1	< 0.11	NA	NA	NA	< 0.1	NA	NA	NA	NA
Acenaphthene	T	µg/L	990	µg/L		< 0.099	< 0.1	< 0.096	< 1.1	< 0.2	< 1	< 0.1	**0.39**	< 0.1	< 0.11	< 1.1	NA	< 1	< 0.1	< 1	NA	< 1	NA
Benzo(a)anthracene	T	µg/L	0.018	µg/L		< 0.0099	NA	< 0.0096	**< 1.1**	**< 0.2**	**< 1**	NA	**0.016**	NA	< 0.011	**< 1.1**	NA	**< 1**	NA	**< 1**	NA	**< 1**	NA
Benzo(b)fluoranthene	T	µg/L	0.018	µg/L		< 0.0099	NA	< 0.0096	**< 1.1**	**< 0.2**	**< 1**	NA	**0.013**	NA	< 0.011	**< 1.1**	NA	**< 1**	NA	**< 1**	NA	**< 1**	NA
Benzofluoranthenes (total-calc'd)	T	µg/L	NV	—		< 0.0099	NA	< 0.0096	< 1.1	< 0.2	< 1	NA	**0.013**	NA	< 0.011	< 1.1	NA	< 1	NA	< 1	NA	< 1	NA
Chrysene	T	µg/L	0.018	µg/L		< 0.0099	**< 0.1**	< 0.0096	**< 1.1**	**< 0.2**	**< 1**	**< 0.1**	**0.1**	**0.5**	< 0.011	**< 1.1**	NA	**< 1**	**< 0.1**	**< 1**	NA	**< 1**	NA
Fluorene	T	µg/L	5300	µg/L		< 0.099	< 0.1	< 0.096	< 1.1	< 0.2	< 1	< 0.1	**1.6**	< 0.1	< 0.11	< 1.1	NA	< 1	< 0.1	< 1	NA	< 1	NA
Naphthalene	T	µg/L	NV	—		NA	< 0.1	NA	NA	NA	NA	< 0.1	NA	**0.19**	NA	NA	NA	NA	< 0.1	NA	NA	NA	NA
Pyrene	T	µg/L	4000	µg/L		NA	< 0.1	NA	NA	NA	NA	< 0.1	NA	**0.33**	NA	NA	NA	NA	< 0.1	NA	NA	NA	NA
Phenol	T	µg/L	1700000	µg/L		NA	NA	NA	NA	NA	**5.8**	NA	NA	NA	NA	NA	NA	< 1	NA	NA	NA	< 1	NA
bis(2-Ethylhexyl)phthalate	T	µg/L	2.2	µg/L		NA	**1.4**	NA	NA	NA	NA	< 1	NA	**2**	NA	NA	NA	NA	< 1	NA	NA	NA	NA

Notes:
Red - Detected value that exceeds screening level
Bold - Detected Result
Blue - Non-detected value that exceeds the screening level
< - Non Detect at the Reporting limit shown.
FD - Field Duplicate
J - Estimated concentration with possible high (indicated with +) and low (indicated with -) bias based on lab QC results
NV - No established value
TPH/NWTPH screening levels obtained from the MTCA Method A Cleanup Level for unrestricted land use
PCBs screening levels are obtained from the Surface Water ARAR - Aquatic Life - Marine/Chronic - National Toxics Rule, 40 CFR 131
Cadium, Copper, Lead, and Silver screening levels are obtained from the WAC Chapter 173-201A-Aquatic Life - Marine/Acute Water Quality Standards for Surface Waters of the State of Washington
All other groundwater screening levels were obtained from the Surface Water ARAR - Human Health – Marine – Clean Water Act §304
NA- Not Analyzed
* MW-07 re-sampled on April 18, 2008 to verify results from the March 12, 2008 sampling event.

Table 9. T-117 Groundwater Detections 2003 – Present (T117 (

Chemical Name	Total/ Dissolved	Unit	Action Level	Action Level Unit	Location ID	MW-06	T117-SB-4	MW-06	MW-06	MW-07	MW-07	MW-07	MW-07*	MW-08	MW-08	MW-08R	MW-09	MW-10
					Sample ID	T117-MW6	MW-6-0806	T117-MW-6	MW-6-0308	T117-MW-7	MW-7-0806	MW-7-0308	MW-7-04180	T117-MW-8	MW-8-0806	MW-8-0308	MW-9-0308	MW-10-0308
					Sample Date	1/14/2004	8/11/2006	6/20/2005	3/13/2008	6/20/2005	8/11/2006	3/12/2008	3/18/2008	6/20/2005	8/10/2006	3/12/2008	3/12/2008	3/11/2008
					Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N
Metals																		
Arsenic	D	mg/L	0.00014	mg/L		NA	**0.00062**	NA	NA	NA	**0.00072**	NA	NA	NA	**0.00086**	NA	NA	NA
Arsenic	T	mg/L	0.00014	mg/L		NA	**0.00065**	NA	NA	NA	**< 0.00068**	NA	NA	NA	**0.00089**	NA	NA	NA
Cadmium	D	mg/L	0.42	mg/L		NA	**0.000064**	NA	NA	NA	< 0.019	NA	NA	NA	**0.000174**	NA	NA	NA
Cadmium	T	mg/L	0.42	mg/L		NA	**0.000115**	NA	NA	NA	**0.000086**	NA	NA	NA	**0.000189**	NA	NA	NA
Chromium	T	mg/L	NV	—		NA	**0.00193**	NA	< 0.005	NA	< 0.34	< 0.005	NA	NA	**0.00246**	< 0.005	< 0.005	< 0.005
Chromium	D	mg/L	NV	—		NA	**0.00052**	NA	NA	NA	< 0.26	NA	NA	NA	**0.00172**	NA	NA	NA
Copper	D	mg/L	0.48	mg/L		NA	NA	NA	**0.006**	NA	NA	< 0.002	NA	NA	NA	**0.002**	**0.003**	**0.004**
Copper	T	mg/L	0.48	mg/L		NA	NA	NA	**0.007**	NA	NA	< 0.002	NA	NA	NA	**0.004**	**0.003**	**0.005**
Lead	T	mg/L	0.21	mg/L		NA	**0.00019**	NA	NA	NA	**0.000043 J**	NA	NA	NA	**0.00009**	NA	NA	NA
Silver	D	mg/L	NV	—		NA	NA	NA	< 0.003	NA	NA	< 0.003	NA	NA	NA	**0.003**	< 0.003	< 0.003
Silver	T	mg/L	0.0019	mg/L		NA	NA	NA	**0.003**	NA	NA	< 0.003	NA	NA	NA	**0.005**	< 0.003	< 0.003
Zinc	T	mg/L	26	mg/L		NA	NA	NA	< 0.01	NA	NA	< 0.01	NA	NA	NA	< 0.01	< 0.01	< 0.01
NWTPH																		
Diesel Range Hydrocarbons	T	mg/L	0.5	mg/L		NA	NA	NA	< 0.25	NA	NA	< 0.25	NA	NA	NA	< 0.25	< 0.25	< 0.25
Motor Oil Range Hydrocarbons	T	mg/L	0.5	mg/L		NA	NA	NA	< 0.5	NA	NA	< 0.5	NA	NA	NA	< 0.5	< 0.5	< 0.5
TPH - Diesel Range	T	mg/L	0.5	mg/L		NA	< 0.25	NA	NA	NA	< 0.25	NA	NA	NA	< 0.25	NA	NA	NA
TPH - Lube Oil Range	T	mg/L	NV	—		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW8082																		
PCBs (total calc'd)	T	µg/L	0.03	µg/L		< 1	**0.02 J**	< 0.18	NA	< 0.08	< 0.01 J	NA	NA	< 0.08	**0.021 J**	NA	NA	NA
Aroclor 1260	T	µg/L	0.03	µg/L		**< 1**	**0.02 J**	**< 0.06**	**0.082**	**< 0.06**	< 0.01 J	**0.082**	< 0.010	**< 0.04**	**0.021 J**	< 0.01	< 0.01	< 0.01
SW8260B																		
Acetone	T	µg/L	NV	—		NA	NA	NA	< 1	NA	NA	**3.8**	NA	NA	NA	< 3	< 3	< 3
Chlorobenzene	T	µg/L	1600	µg/L		NA	NA	NA	< 0.2	NA	NA	< 0.2	NA	NA	NA	< 0.2	< 0.2	< 0.2
cis-1,2-Dichloroethene	T	µg/L	NV	—		NA	NA	NA	< 0.2	NA	NA	< 0.2	NA	NA	NA	< 0.2	< 0.2	**1.2**
Tetrachloroethene	T	µg/L	3.3	µg/L		NA	NA	NA	< 0.2	NA	NA	< 0.2	NA	NA	NA	< 0.2	**1**	**2**
Trichloroethene	T	µg/L	30	µg/L		NA	NA	NA	< 0.2	NA	NA	< 0.2	NA	NA	NA	< 0.2	< 0.2	**0.5**
Total Xylenes (calc'd)	T	µg/L	NV	—		< 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	T	µg/L	NV	—		NA	NA	NA	< 0.2	NA	NA	< 0.2	NA	NA	NA	< 0.2	< 0.2	< 0.2
Xylene (meta & para)	T	µg/L	NV	—		< 1	NA	NA	< 0.4	NA	NA	< 0.4	NA	NA	NA	< 0.4	< 0.4	< 0.4
SW8270D SIM																		
Total HPAH (calc'd)	T	µg/L	NV	—		< 1	< 1	NA	NA	NA	< 1	NA	NA	NA	< 1	NA	NA	NA
Total LPAH (calc'd)	T	µg/L	NV	—		< 1	< 1	NA	NA	NA	< 1	NA	NA	NA	< 1	NA	NA	NA
Total PAH (calc'd)	T	µg/L	NV	—		< 1	< 1	NA	NA	NA	< 1	NA	NA	NA	< 1	NA	NA	NA
1-Methylnaphthalene	T	µg/L	NV	—		NA	NA	NA	< 0.1	NA	NA	< 0.1	NA	NA	NA	< 0.1	< 0.1	< 0.1
Acenaphthene	T	µg/L	990	µg/L		< 1	< 1	NA	< 0.1	NA	< 1	< 0.1	NA	NA	< 1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	T	µg/L	0.018	µg/L		**< 1**	**< 1**	NA	NA	NA	**< 1**	NA	NA	NA	**< 1**	NA	NA	NA
Benzo(b)fluoranthene	T	µg/L	0.018	µg/L		**< 1**	**< 1**	NA	NA	NA	**< 1**	NA	NA	NA	**< 1**	NA	NA	NA
Benzofluoranthenes (total-calc'd)	T	µg/L	NV	—		< 1	< 1	NA	NA	NA	< 1	NA	NA	NA	< 1	NA	NA	NA
Chrysene	T	µg/L	0.018	µg/L		**< 1**	**< 1**	NA	**< 0.1**	NA	**< 1**	**< 0.1**	NA	NA	**< 1**	**< 0.1**	**< 0.1**	**< 0.1**
Fluorene	T	µg/L	5300	µg/L		< 1	< 1	NA	< 0.1	NA	< 1	< 0.1	NA	NA	< 1	< 0.1	< 0.1	< 0.1
Naphthalene	T	µg/L	NV	—		NA	NA	NA	< 0.1	NA	NA	< 0.1	NA	NA	NA	< 0.1	< 0.1	< 0.1
Pyrene	T	µg/L	4000	µg/L		NA	NA	NA	< 0.1	NA	NA	< 0.1	NA	NA	NA	< 0.1	< 0.1	< 0.1
Phenol	T	µg/L	1700000	µg/L		NA	< 1	NA	NA	NA	< 1	NA	NA	NA	< 1	NA	NA	NA
bis(2-Ethylhexyl)phthalate	T	µg/L	2.2	µg/L		NA	NA	NA	**1.5**	NA	NA	< 1	NA	NA	NA	**1.1**	< 1	**1.2**

Notes:
Red - Detected value that exceeds screening level
Bold - Detected Result
Blue - Non-detected value that exceeds the screening level
< - Non Detect at the Reporting limit shown.
FD - Field Duplicate
J - Estimated concentration with possible high (indicated with +) and low (indicated with -) bias based on lab QC results
NV - No established value
TPH/NWTPH screening levels obtained from the MTCA Method A Cleanup Level for unrestricted land use
PCBs screening levels are obtained from the Surface Water ARAR - Aquatic Life - Marine/Chronic - National Toxics Rule, 40 CFR 131
Cadium, Copper, Lead, and Silver screening levels are obtained from the WAC Chapter 173-201A-Aquatic Life - Marine/Acute Water Quality Standards for Surface Waters of the State of Washington
All other groundwater screening levels were obtained from the Surface Water ARAR - Human Health – Marine – Clean Water Act §304
NA- Not Analyzed
* MW-07 re-sampled on April 18, 2008 to verify results from the March 12, 2008 sampling event.

Tables 1 through 4 are in the report

Table 6 is in the report

Figure 2. Site map

Prepared by MVI, edited MVI 11/16/07; F:\PROJECTS\GIS\ArcGIS8\POS_T117\Projects\NewFigures11_10_07\T117_Figure2 Sitemap.mxd (Created in ArcGIS 9.2)

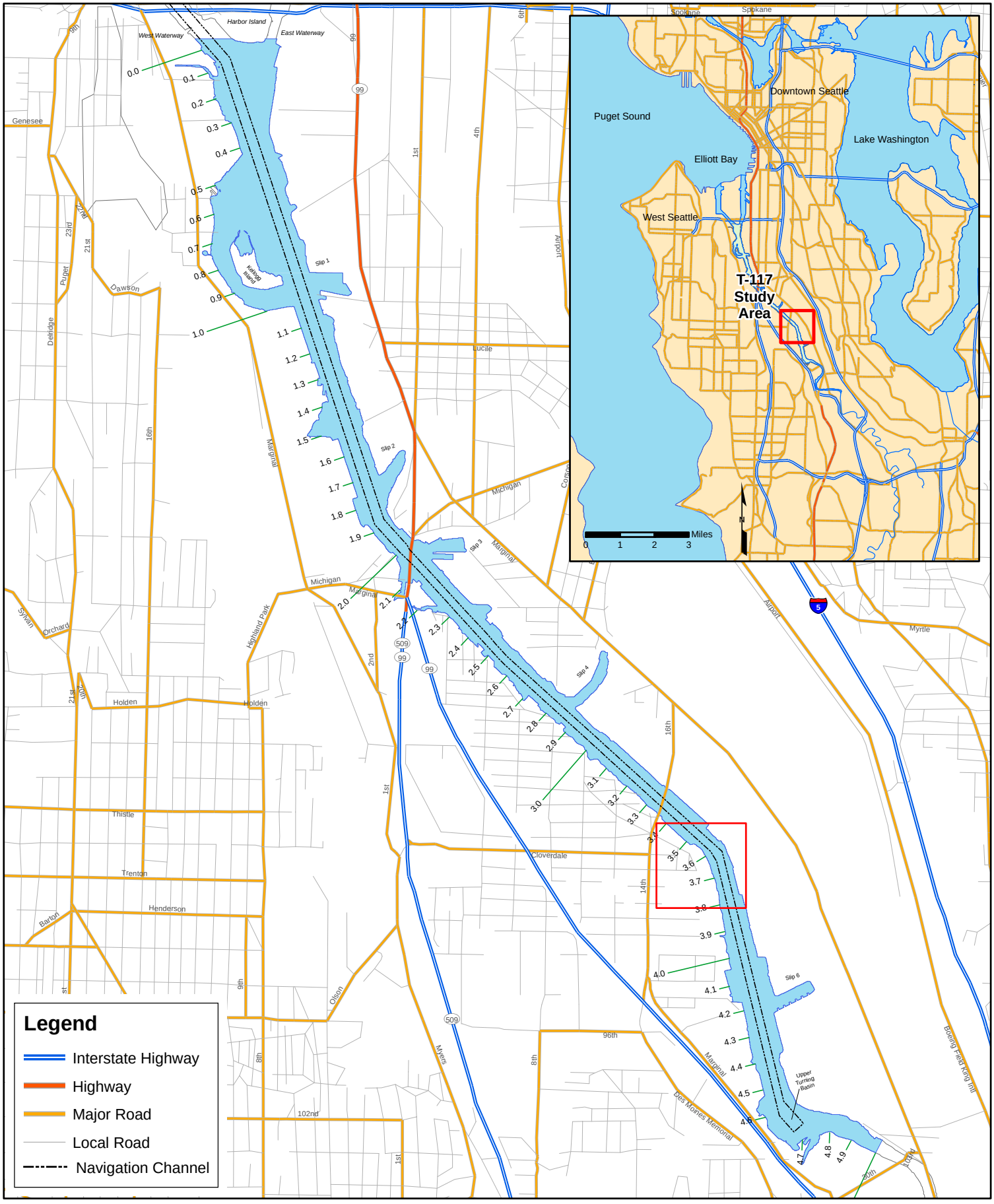
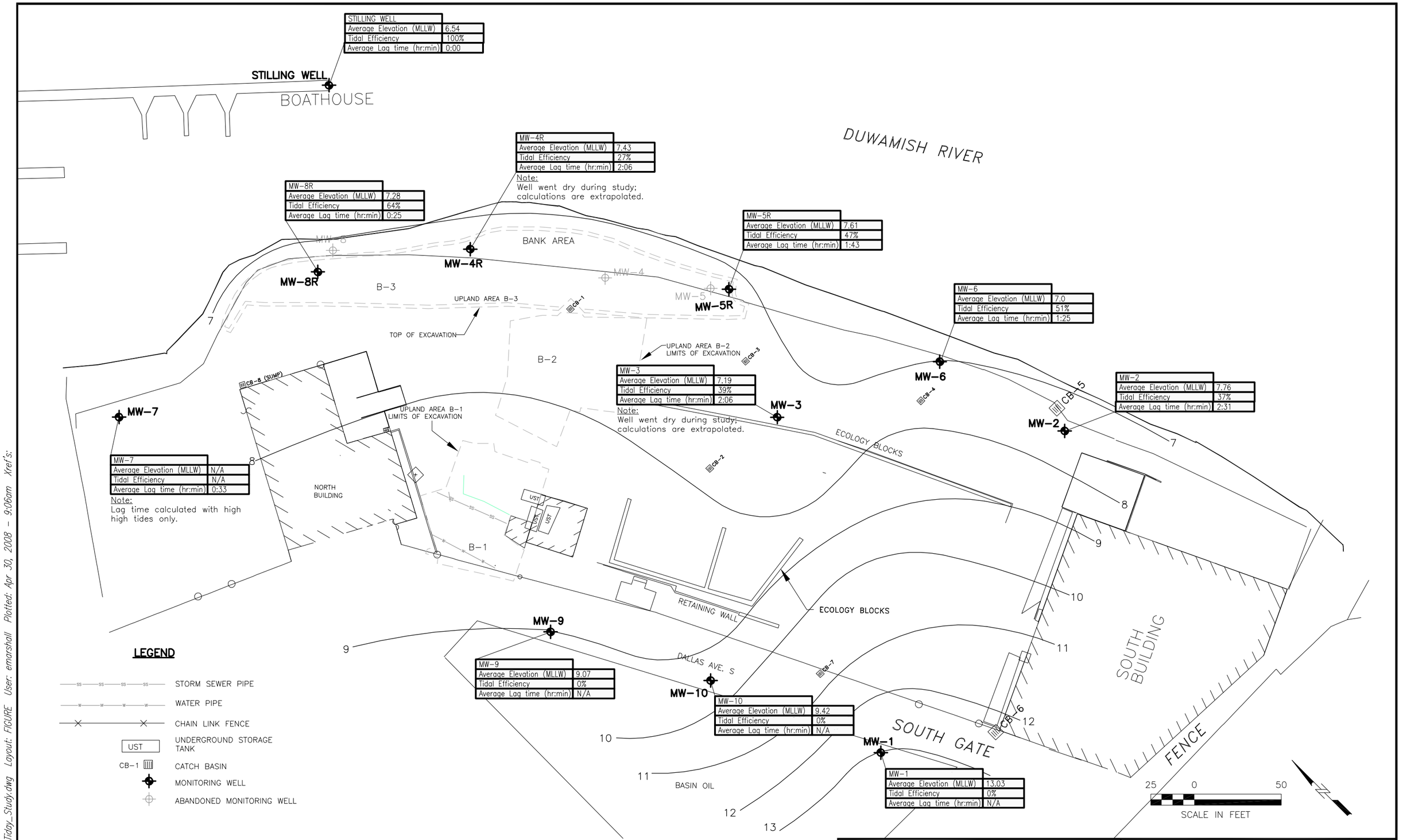


Figure 1. T-117 study area

F:\PROJECT\SGIS\ArcGIS8\POS_T117\Projects\Figure1-1GeneralLayout.mxd



NOTE: SURVEY DATA PROVIDED BY PORT OF SEATTLE SURVEY SERVICES.

ENSR | AECOM

PORT OF SEATTLE T-117
SEATTLE, WASHINGTON
05842-016-100

DATE: 4/24/08 | DRWN: E.M./SEA

NET GROUNDWATER FLOW DIRECTION, TIDAL EFFICIENCIES, AND TIDAL LAG TIMES 3/4/08-3/5/08

FIGURE 3

File: L:\T-117\Tidy_Study.dwg Layout: FIGURE User: emarshall Plotted: Apr 30, 2008 - 9:06am Xref's:

Port of Seattle; City of Seattle responses to EPA Final Comments of July 17, 2008 Draft First Quarter 2008 Interim Groundwater Monitoring Data Results – Non-Time Critical Removal Action Report, May 2, 2008
T-117 Early Action Area, Lower Duwamish Waterway Superfund Site, Seattle, Washington

Comment Responses are included in *italics* below the comment.

EPA Comments on Draft 1Q08 Interim Groundwater Monitoring Data Results (May 2, 2008)

General Comments:

1. In general, the Data Validation and Monitoring Data Report (Report) are complete and very well-organized. The validation had no significant deviations from the QAPP and the EPA quality guidance criteria. Most of the sample results affected by an out of control QC run were appropriately qualified, although, in some instances (as listed below), there were a few QC items that were not discussed or mentioned in the validation report.

Comment noted.

2. In addition, it is highly recommended that a final data spreadsheet with both the lab and applied validation qualifiers must be included as an attachment to the Monitoring Report.

Two spreadsheets have been created, one for for soil and one for groundwater, in the requested format. Both hard and electronic copies have been attached as Appendix F to the Report and will be attached to future reports.

3. In some of the samples, both Aroclors 1254 and 1260 were detected but only the PCB 1260 was reported. This is acceptable especially if a clean chromatographic separation of the Aroclor peaks could not be obtained. In cases like this, however, it is highly recommended that the Aroclor 1254 as non-detects at the elevated reporting limits due to 1260 interferences or as a detected compound with an estimated qualifier, "J".

The approach mentioned in the comment does not appear to follow method (SW-846 8082) requirements. If Aroclor 1254 met all identification requirements (retention time, second-column or GC/MS confirmation) then this analyte would have been reported with its' own concentration. We do not see that second column confirmation was achieved for Aroclor 1254. SW-846 method 8082 states that: "Compound identification

based on single-column analysis should be confirmed on a second column, or should be supported by at least one other qualitative technique."

Specific Comments:

4. Volatile Organic Compound Analyses (VOCs)

The following VOC target compounds exceeded the control limit criteria for the initial Calibration Verification Standard runs, indicating high bias in the associated results. Although the associated results do not need qualifications, these out of control ICV runs should have been discussed in the validation report.

Analysis Dates	Compounds	Recoveries (%)	Control Limits (%)	Qualifiers Detects/Non-Detects
ICV031208 03/12/08 0929 AM	Hexachlorobutadiene Naphthalene 1,2,3-trichlorobenzene	135 110.7 125	66-130 62-106 71-113	J/None J/None J/None
ICV031208 3/13/08 10:08 AM	Chloromethane 1,1,1-trichloroethane 1,1-dichloropropene Trichlorethene 1,2-dichloropropane Trans-1,3-dichloropropene	123 113 120 116 115 124	44-120 73-112 75-115 73-113 77-113 64-117	
Continuing Calibrations		%Ds	Control Limits	
CCV NT7 3/14/08 11:11	Dichlorodifluoromethane Trichlorofluoromethane Carbon tetrachloride 1,2-dochlotoethane	-26 -28.9 -37.4 -34	±25 ±25 ±25 ±25	J/UJ J/UJ J/UJ J/UJ
CCV NT5 3/18/08 10:46	Chloroethane	-41	±25	J/UJ

Per current USEPA CLP National Functional Guidance (NFG), undetected analytes associated with high ICV %Rs (high bias indicators) do not require qualification. Included in the data validation report under item 13 is this comment:

> *"Noncompliant relative response factors (RRFs), percent relative standard deviations (%RSDs), percent differences (%Ds), and/or percent recoveries (%Rs) associated with non-target analytes or non-project samples, or **high bias indicators associated with undetected project sample results, were not considered during validation since they do not affect reported project sample results**."*

We believe that this level of data validation reporting is sufficient since these outliers do not impact data results.

For the CCV data listed above, the affected analytes were qualified in the data set and the outliers were defined in the data validation report. All affected analytes were non-detect, so only UJ qualifiers were assigned.

5. Laboratory Control Samples (LCS) – The following compounds exceeded the recovery criteria indicating high bias in the associated detected results. Associated detected sample results should be qualified estimated, "J".

1, 1, 1-trichlorethane = 120% high bias
Carbon tetetrachloride = 135% high bias
Trans-1, 2-dichloropropene = 121% high bias

According to SW-846 Method 8000, Section 8.5.4, Recommended QC acceptance criteria for matrix spike samples and LCS: "Many methods may not contain recommended acceptance criteria for LCS results. The laboratory should use 70 - 130% as an interim acceptance criteria for recoveries of spiked analytes, until in-house LCS limits are developed. Where in-house limits have been developed for matrix spike recoveries, the LCS results should fall within those limits, as the LCS is prepared in a clean matrix.…As a general rule, the recoveries of most compounds spiked into samples should fall within the range of 70 - 130%, and this range should be used as a guide in evaluating in-house performance."

Based on this directive from the method, the stated LCS %Rs for 1,1,1-TCA and trans-1,2-DCPE were compliant since they fell within the 70-130% data validation QC limits. The high carbon tetrachloride %R did not initiate qualification of sample data since this analyte was not detected in any project samples. The data validation report states in item 15: "High spike recoveries associated with undetected project sample results did not initiate data qualification since the indicated high system bias was not realized."

Again, we believe that this level of data validation reporting is sufficient since these outliers do not impact data results.

6. PCB Aroclor Analyses:

a. All of the sample quantitation reports listed the sample matrix as water and not soil. For proper documentation, these QL reports should be corrected by the lab or reconciled with all the other Chain of custody and sample documentation.

We could find no instance for ARI Job Nos. MK73 and MK 75 where the sample matrix was mistakenly noted as water rather than soil. Please let us know where this mistake occurred and we will reconcile it.

b. All reported results with a lab qualifier "Y" must be given an appropriate validation qualifier, "U" with an elevated detection limit due to PCB interference.

There are no defined data validation qualifiers for this instance. In the data validation report (Item 6) we can mention this occurrence. Although we have not made this change, we could define our own qualifier (maybe UY) for these individual analytes.

The UY qualifier would mean undetected at an elevated reporting limit due to interference. We have not made

c. Eight samples had detections of both 1260 and 1254. Only the PCB1260 was reported in the samples because it was the more pre-dominant PCB in the sample. If the chromatographic separation of the 1254 major peaks could not be attained for an accurate quantitation, it is highly recommended that the 1254 detection limits be elevated at the level of the detection or report them as an estimated detection in the samples.

As previously indicated, positive identification of Aroclor 1254 was not obtained (see response to comment 3 above). Aroclor 1260 appeared to be the predominant Aroclor so it was positively identified and quantified. Where concentrations of Aroclor 1254 were below the reporting limit they were not reported. If Aroclor 1254 meets the identification criteria indicated in the response to comment 3, above, then it will be reported separate from Aroclor 1260 with either elevated reporting limits or qualified concentrations if quantitation cannot be accurately obtained. Any anomalies like this will also need to be clearly addressed in the laboratory case narrative.

d. The following samples had 1254 but were not reported by the lab:

Sample Number	Calculated Aroclor 1254 Concentration (ug/Kg)	%D between columns/ Qualifier
MW-05-0.5-2.0	960	<30% no flag
MW-05-7.5-9.0	680	>30% /J
MW-05-10-11.5	2100	>30% /J
MW-10-2.5-4.0	670	>30% /J
MW-10-5-6.5	220	>30% /J
MW-10-7.5-9.0	41	>30% /J
MW-09-0.5-2.0	630	>30% /J
MW-04R-2.5-4.0	1800	>30% /J

We do not believe that sample identification criteria were met for these Aroclor 1254 results as discussed in the response to comment 3, above.

7. Total Petroleum Hydrocarbon Analyses: Motor Oil – AK103 C25-C36 – all %Ds in the continuing calibration verification (CCV) runs exceeded the control limits of 25% indicating high bias in the associated results, detected results must be qualified estimated, “J”. No flags for non-detects.

The method followed for this analysis was Diesel Range Hydrocarbons (DRH) as Diesel and Motor Oil by Washington Department of Environment (WDOE) GC/FID method NWTPH-Dx. The NWTPH-Dx QC limits were set at 0-20%RSD for ICV and 0-15%D for CCV for target analytes. The WAMoil (C24-C38) CCV %Ds all complied with these

CCV objectives. The AK103 CCV %Ds are not applicable to this analysis since this was not the carbon range reported for Motor oil and since the AK103 (ADEC) method was not followed.