



American Crossarm and Conduit Monitoring Results September 1999 and June 2000

Abstract

This document is one in a series describing the results of groundwater and surface water monitoring at the American Crossarm and Conduit site. Groundwater and surface water downgradient of the facility are being monitored to determine if the selected remedy of off-site disposal and containment of some of the contaminated soil and sediment on the facility property has been an effective form of remediation. Ecology has conducted monitoring at this site since 1997.

Results of samples collected in September 1999 and June 2000 from two downgradient monitoring wells (MW-24 and MW-25) and two on-site surface water stations (ACCSW1 and ACCSW2) are discussed. All samples collected were analyzed for polynuclear aromatic hydrocarbons (PAHs) and chlorinated phenolics.

In both sampling periods, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene were the only PAHs detected in the downgradient monitoring wells. Mean concentrations were 0.022 ug/L for naphthalene, 0.014 ug/L for 2-methylnaphthalene, and 0.008 ug/L for 1-methylnaphthalene. None of the PAH constituents exceeded applicable standards. Chlorinated phenolics were not detected in either of the wells during these two rounds of sampling.

Most of the PAHs analyzed for were detected at both surface water stations. Pentachlorophenol was tentatively identified at station ACCSW1 in September 1999. All detected analytes in the surface water samples were far below established water quality criteria for fresh water (EPA, 1992).

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Background

American Crossarm and Conduit (ACC) of Chehalis, Washington (Figure 1) conducted woodcutting, milling, and treatment of electrical utility poles from the early 1930s to 1985. In 1988 ACC was added to EPA's National Priorities List due to noncompliance of waste handling requirements, which resulted in the contamination of both on- and off-site soil, groundwater and surface water. Pentachlorophenol (PCP), polynuclear aromatic hydrocarbons (PAHs) and dioxins/furans were the primary contaminants identified. Remedial action at the ACC site, conducted by the EPA, consisted of the reduction of floating product on groundwater beneath the facility, off-site disposal of facility structures and the most contaminated soil, and containment of the remaining contaminated soil on the facility property.

After EPA's cleanup activities were completed in the mid-1990s the operation and maintenance responsibilities for the site were transferred to the Washington State Department of Ecology (Ecology). In 1997 Ecology initiated semi-annual sampling of downgradient monitoring wells and surface water to assess the effectiveness of the remedial action. This work is scheduled until the year 2001, at which time the monitoring program will be evaluated.

Methods

Groundwater Sampling

On September 29, 1999, groundwater and surface water samples were collected from two downgradient wells, MW-24 and MW-25, and two on-site surface water stations, ACCSW1 and ACCSW2 (Figure 2). On June 8, 2000, samples were collected from well MW-25 and stations ACCSW1 and ACCSW2. Monitoring well MW-24 was not sampled in June since data from this well may no longer be reliable. Various site conditions (ground subsidence, and site filling and grading) have rendered wells MW-22, MW-23, and MW-24 unusable. MW-23 was decommissioned in the fall of 1998. MW-22 and MW-24 were decommissioned in the fall of 2000.

Sampling methods were consistent with those previously used on this project. Static water levels were recorded prior to well purging. All wells were purged and sampled using a stainless steel submersible pump with a pump rate of about 0.5-gpm. Samples were collected when pH, specific conductance, and temperature readings stabilized (changes of 10% or less between measurements).

Surface Water Sampling

Two surface water samples were collected to determine if adjacent wetlands are receiving contaminants from the ACC site. Samples were collected from two areas considered representative of the site. Surface water samples were collected using decontaminated stainless steel beakers, and transferred to 1-gallon sample jars. The surface water was assumed to be fully

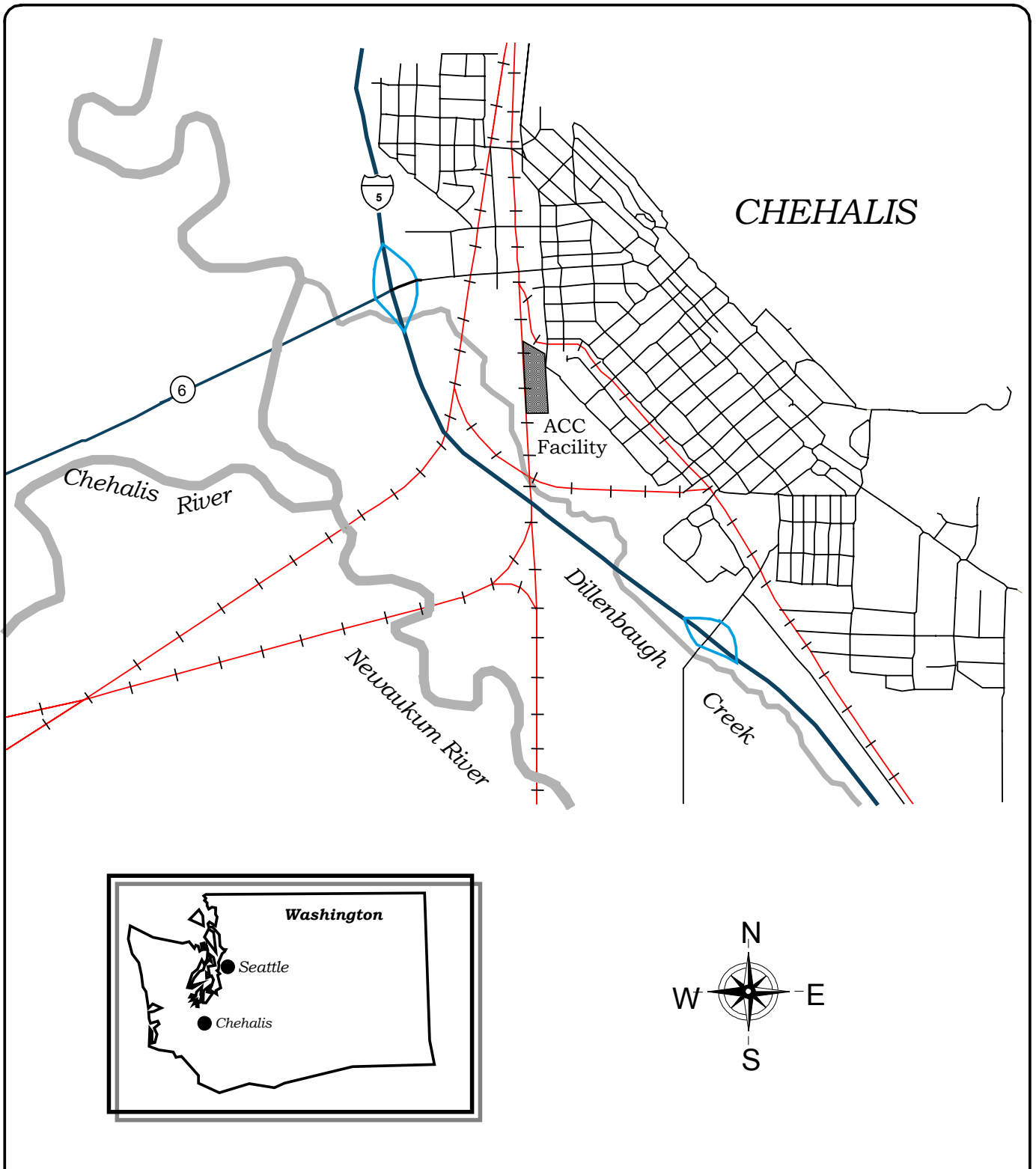


Figure 1: American Crossarm & Conduit Site Location

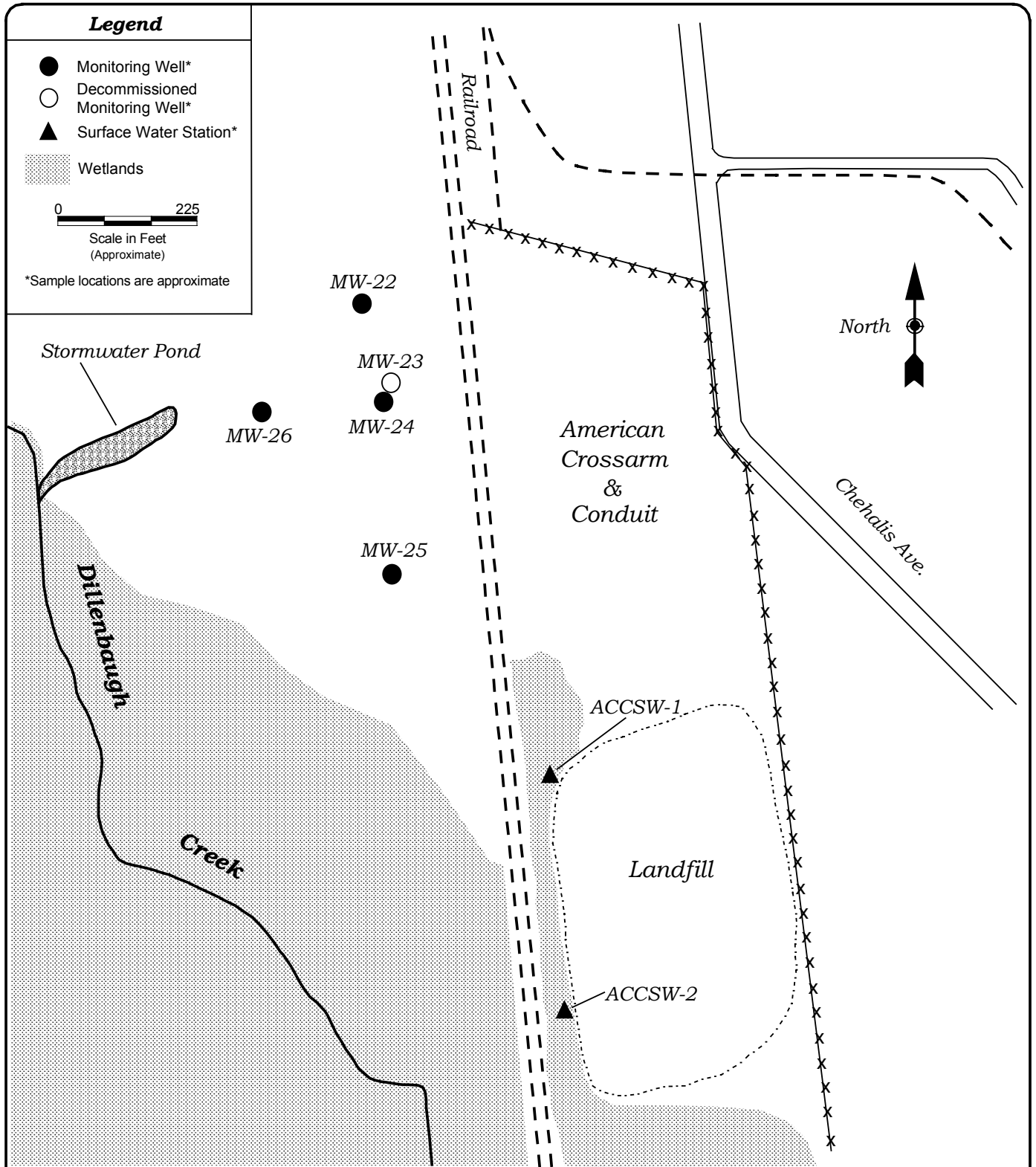


Figure 2: American Crossarm & Conduit Sample Locations

mixed, and the sample was collected at mid-depth and as close to the center of flowing water as could be reached from the bank. Temperature, pH, and specific conductance were measured in the field.

Sampling procedures are discussed in greater detail in Appendix A.

Analysis

Target analytes, analytical method, and detection limits are listed in Table 1.

Table 1: Analytical Methods for September 1999 and June 2000 Samples

Analytes	Method	Reference	Target Detection Limit
Field			
Water Level	Solinst Well Probe	NA	0.01 feet
pH	Orion 25A Field Meter	NA	0.1 Std. Units
Temperature	Orion 25A Field Meter	NA	0.1°C
Specific Conductance	Beckman Conductivity Bridge	NA	10 umhos/cm
Laboratory			
PAHs	SW-846 Method 8270 (SIM)	U.S. EPA 1984	0.1 ug/L
Chlorinated Phenolics	SW-846 Method 8150	U.S. EPA 1986	0.01-1.0 ug/L

The detection limits achieved for PAHs and chlorinated phenolics are generally lower than the stated method detection limit, which is required for this project to meet cleanup standards.

In general, the quality of the data is acceptable. Quality control samples collected in the field consisted of blind field duplicate samples, which were obtained from well MW-25. The numeric comparison of duplicate results is expressed as relative percent difference (RPD). The RPDs for PAH results in September were within 7%, and in June within 14%. In addition to field quality control samples, laboratory blanks, duplicate matrix spikes, and surrogate compound recoveries were performed in the laboratory. Due to the low detection levels achieved with the SIM mode analysis for PAHs, low levels of some target compounds were detected in the laboratory blanks. Compounds that were found in the sample and in the blank were considered native to the sample if the area counts in the sample are greater than or equal to five times the area counts in the associated method blanks. Results for these samples are considered real and do not require qualification. Surrogate compound recoveries, as well as matrix spike results, were within acceptable limits. Further discussion of quality assurance is presented in Appendix B. Laboratory reporting sheets are available upon request.

Results

Field Observations

Depth-to-water measurements and purge volume, as well as pH, specific conductance, and temperature readings, at the time of sampling are listed in Table 2. All field parameters were within expected ranges.

Table 2: Summary of Field Parameters Results for September 29, 1999 and June 8, 2000

Monitoring Well	Total Depth (feet) ¹	Depth to Water (feet) ²	pH (standard units)	Specific Conductance (umhos/cm)	Temperature (°C)	Purge Volume (gallons)
September						
MW-24	42.49	4.65	7.1	478	15.7	14
MW-25	39.43	4.38	7.0	440	16.7	15
ACCSW1	--	--	7.4	440	19.6	--
ACCSW2	--	--	7.4	360	16.3	--
June						
MW-25	39.43	3.35	6.7	441	15.7	17
ACCSW1	--	--	7.6	243	18.9	--
ACCSW2	--	--	6.8	310	17.0	--

¹ As measured from top of the PVC casing.

² Measured from top of casing.

Since monitoring began in 1997 the condition of the monitoring well network (MW-22 to MW-25) has declined. These four wells were installed in 1991. The well logs describe the upper five to 12 feet of surface material as loose fill composed of wood chips and bark, with variable gravel content, which is very soft with limited bearing capacity. It appears that this layer is compressing and/or decomposing, causing the wells' protective outer casings and concrete pads to sink below the top of the well casings. The uneven subsidence of the protective casing and concrete pad for well MW-22 caused the well casing to bend. Since the well casing may be cracked, this well is no longer sampled because the reliability of the data collected is unknown. Well MW-24 was also eliminated from the monitoring program in June for similar reasons. Both wells were decommissioned in the fall of 2000. In addition, the property where the wells are located has been filled and graded. In 1998 well MW-23 was damaged while the property was cleared and subsequently has been decommissioned.

Analytical Results

Analytical results of PAH and chlorinated phenolics analysis for September 1999 are summarized in Table 3.

Table 3: Summary of Analytical Results (ug/L) for September 29, 1999

Sample Station	MW-24		MW-25		ACCSW1		ACCSW2	
<u>Polynuclear Aromatic Hydrocarbons</u>								
Naphthalene	0.016	U	0.016	U	0.058		0.62	J
Acenaphthylene	0.016	U	0.016	U	0.016	U	0.016	U
Acenaphthene	0.016	U	0.016	U	0.16		0.27	
Fluorene	0.016	U	0.016	U	0.12		0.17	
Phenanthrene	0.016	U	0.016	U	0.2		0.11	
Anthracene	0.016	U	0.016	U	0.071		0.03	
Sum LPAH	0.016	U	0.016	U	0.609		1.2	J
Fluoranthene	0.016	U	0.016	U	0.26		0.042	
Pyrene	0.016	U	0.016	U	0.19		0.025	
Benzo(a)anthracene	0.016	U	0.016	U	0.035		0.0041	J
Chrysene	0.016	U	0.016	U	0.079		0.0097	J
Benzo(b)fluoranthene	0.016	U	0.016	U	0.063		0.011	J
Benzo(k)fluoranthene	0.016	U	0.016	U	0.033		0.0051	J
Benzo(a)pyrene	0.016	U	0.016	U	0.012	J	0.005	J
Ideno(1,2,3-cd)pyrene	0.016	U	0.016	U	0.021		0.0044	J
Dibenzo(a,h)anthracene	0.016	U	0.016	U	0.0047	J	0.016	U
Benzo(ghi)perylene	0.016	U	0.016	U	0.016	J	0.0046	J
Sum HPAH	0.016	U	0.016	U	0.7137	J	0.1109	J
2-Methylnaphthalene	0.011	J	0.015	J	0.087		0.14	
1-Methylnaphthalene	0.0051	J	0.0072	J	0.064		0.11	
Dibenzofuran	0.016	U	0.016	U	0.059		0.1	
Retene	0.016	U	0.016	U	0.065		0.0035	J
<u>Chlorinated Phenolics</u>								
2,4,6-Trichlorophenol	0.048	U	0.046	U	0.049	U	0.054	U
2,4,5-Trichlorophenol	0.048	U	0.046	U	0.049	U	0.054	U
2,3,4,6-Tetrachlorophenol	0.044	U	0.042	U	0.045	U	0.049	U
2,3,4,5-Tetrachlorophenol	0.044	U	0.042	U	0.045	U	0.049	U
Pentachlorophenol	0.04	U	0.038	U	0.013	NJ	0.045	U

U : The analyte was not detected at or above the reported value.

J : The analyte was positively identified. The associated numerical result is an estimate.

NJ: There is evidence that the analyte is present. The associated numerical result is an estimate.

Bold: Detected value.

In September, 2-methylnaphthalene and 1-methylnaphthalene were the only PAHs detected in the wells monitored. Estimated concentrations for 2-methylnaphthalene ranged from 0.011 to 0.015 ug/L, while 1-methylnaphthalene ranged from 0.0051 to 0.0072 ug/L. Chlorinated phenolics were not detected in either of the wells during this round of sampling.

Most of the target PAHs were detected at both surface water stations. Pentachlorophenol was tentatively identified at station ACCSW1 at an estimated concentration of 0.013 ug/L. No chlorinated phenolics were detected at station ACCSW2 during this round of sampling.

Results of organics analysis of samples collected in June 2000 are summarized in Table 4.

Table 4: Summary of Analytical Results (ug/L) for June 8, 2000

Sample Station	MW-25	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons</u>			
Naphthalene	0.022	0.037	0.016
Acenaphthylene	0.0067 U	0.0067 U	0.0067 U
Acenaphthene	0.0067 U	0.1	0.058
Fluorene	0.0067 U	0.057	0.039
Phenanthrene	0.0067 U	0.068	0.047
Anthracene	0.0067 U	0.026	0.018
Sum LPAH	0.022	0.288	0.178
Fluoranthene	0.0067 U	0.055	0.046
Pyrene	0.0067 U	0.026	0.021
Benzo(a)anthracene	0.0067 U	0.0058 J	0.0051 J
Chrysene	0.0067 U	0.0075	0.0041 J
Benzo(b)fluoranthene	0.0067 U	0.0067	0.0046 J
Benzo(k)fluoranthene	0.0067 U	0.006 J	0.0056 J
Benzo(a)pyrene	0.0067 U	0.0085	0.0067 U
Ideno(1,2,3-cd)pyrene	0.0067 U	0.0031 J	0.0067 U
Dibenzo(a,h)anthracene	0.0067 U	0.0067 U	0.0067 U
Benzo(ghi)perylene	0.0067 U	0.003 J	0.0067 U
Sum HPAH	0.0067 U	0.1216 J	0.0864 J
2-Methylnaphthalene	0.016	0.038	0.013
1-Methylnaphthalene	0.011	0.029	0.015
Dibenzofuran	0.0067 U	0.0067 U	0.0067 U
Retene	0.0067 U	0.0067 U	0.0067 U
<u>Chlorinated Phenolics</u>			
2,4,6-Trichlorophenol	0.04 U	0.042 U	0.04 U
2,4,5-Trichlorophenol	0.04 U	0.042 U	0.04 U
2,3,4,6-Tetrachlorophenol	0.037 U	0.038 U	0.036 U
2,3,4,5-Tetrachlorophenol	0.037 U	0.038 U	0.036 U
Pentachlorophenol	0.033 U	0.035 U	0.033 U

U : The analyte was not detected at or above the reported value.

J : The analyte was positively identified. The associated numerical result is an estimate.

Bold: Detected value.

In June, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene were the only PAHs detected in monitoring well MW-25, with concentrations of 0.022 ug/L, 0.016 ug/L, and 0.011 ug/L, respectively. Chlorinated phenolics were not detected in MW-25 during this round of sampling.

As in the September sampling, most of the PAHs analyzed for were detected at both surface water stations. In general, concentrations of LPAH and HPAH were higher in the September sampling than in the June results. Chlorinated phenolics were not detected at either surface water station during this round of sampling.

Discussion

Groundwater and surface water downgradient of the facility are being monitored to determine if the selected remedy of off-site disposal and containment of some of the contaminated soil and sediment on the facility property has been an effective form of remediation. At the completion of remediation, long distance transport of PAHs in groundwater was considered very unlikely due to the location of the remaining contaminant plumes, the physical properties of PAHs, and the tight hydrogeologic setting. It was anticipated that remaining PAHs on the ACC property would either become bound to soil particles, microbiologically degrade, or be resolubilized into the water column.

Because large volumes of contaminated soil were present on site, due to low levels of contaminants exceeding cleanup standards at all depths, Model Toxic Control Act (MTCA) Method B cleanup standards were established for areas of contamination within the facility boundary. MTCA Method B cleanup standards for groundwater within the facility boundary are 0.012 ug/L for carcinogenic PAHs (CPAHs) and 0.729 ug/L for pentachlorophenol (PCP). The facility boundary is the point of compliance for groundwater for MTCA Method A cleanup standards and Safe Drinking Water Act (SDWA) MCLs. Groundwater beneath the site is not expected to be used as a source of drinking water due to the very low permeability of the site, expected low well yield, and deed restrictions. SDWA MCLs will be met at the facility boundary. MTCA Method A cleanup standards of 0.1 ug/L for CPAHs in groundwater would also be met at the facility boundary due to the hydrogeologic setting and the physical properties of PAHs.

In September 1999 and June 2000, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene were the only PAHs detected in the downgradient monitoring wells. These PAHs are not classified as carcinogens and, therefore, do not exceed any of the standards that are applicable to this project. Because only two of the original four monitoring wells could be sampled in September, and one well in June, results may not be representative of site conditions. Since beginning the monitoring program in 1997, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene have been the primary PAHs detected in the downgradient wells (as shown in Appendix C). The monitoring does indicate that PAHs are migrating beyond the facility boundary, even though concentrations have been below applicable standards. Naphthalene, 2-methylnaphthalene and 1-methylnaphthalene have a greater solubility due to their lower molecular weights. Water solubility is a direct function of molecular weight, with the lighter weight compounds having greater solubility. In general, however, water solubility is relatively low for all PAHs due to their high octanol/water partition coefficients.

Chlorinated phenolics were not detected in either well during September or June; however, PCP was detected in well MW-22 in 1998. PCP was expected to undergo a fate similar to PAHs, such

as absorption to soil particles and organic materials in the subsurface. Long-distance transport in groundwater was considered unlikely.

Most of the PAHs analyzed for were detected at both surface water stations during both sample events. Considering that these samples are collected adjacent to the landfill in which contaminated site debris was placed and a railroad track, the occurrence of PAHs in the surface water samples is not unexpected. In September the sum of the LPAH doubled from the upstream station (ACCSW1) to the downstream station (ACCSW2) and the HPAH decreased from ACCSW1 to ACCSW2. In June the sum of both the LPAH and HPAH decreased from station ACCSW1 to station ACCSW2. Overall, PAH concentrations typically decrease from the upstream station to the downstream station. In the environment, PAHs can volatilize, become fixed to sediments, biodegrade, or be photo-oxidized.

Table 5 is a summary of ambient water quality criteria for fresh water established for select PAHs and chlorinated phenolics. All detected analytes in the surface water samples were far below the fresh water quality criteria (EPA, 1992). For comparison, human health criteria for fresh water have also been included in Table 5. Over the monitoring period, HPAH concentrations have exceeded some of these criteria. However, access to the area where the surface water samples are collected is restricted with fencing and posted warning signs.

Table 5: Summary of Water Quality and Human Health Criteria for Fresh Water (ug/L)

	Priority Pollutant	Carcinogen	Fresh Acute Criteria	Fresh Chronic Criteria	Human Health Criteria
<u>PAHs</u>					
Naphthalene	Y	N	2300	620	
2-Chloronaphthalene	Y	N	1,600		
Acenaphthene	Y	N	1,700*	520*	
Fluorene	Y	N			1,300
Anthracene	Y	N			9,600
Fluoranthene	Y	N	3,980		300
Pyrene	Y	N			960
Benzo(a)anthracene	Y	Y			0.0028
Chrysene	Y	Y			0.0028
Benzo(b)fluoranthene	Y	Y			0.0028
Benzo(k)fluoranthene	Y	Y			0.0028
Benzo(a)pyrene	Y	Y			0.0028
Dibenzo(a,h)anthracene	Y	Y			0.0028
Indeno(1,2,3-cd)pyrene	Y	Y			0.0028
<u>Chlorinated Phenolics</u>					
2,4,6-Trichlorophenol	Y	Y		970	2.10
2,4,5-Trichlorophenol	N	N			
Pentachlorophenol (for a pH of 6.5)	Y	Y	5.49	3.46	0.28

* Insufficient data to develop criteria value.

(EPA, 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule.)

Conclusions and Recommendations

- In September 1999 and June 2000, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene were the only PAHs detected in the downgradient monitoring wells. Although monitoring since 1997 indicates that PAHs are migrating beyond the facility boundary, none of the PAHs detected exceeds any applicable standards. Monitoring of the downgradient wells should continue as scheduled during the year 2001, at which time the monitoring program should be evaluated.
- Most of the PAHs analyzed for were detected at both surface water stations during both sample events. Considering that these samples are collected adjacent to the landfill in which contaminated site debris was placed and a railroad track, the occurrence of PAHs in the surface water samples is not unexpected. All detected analytes in the surface water samples were far below established water quality criteria for fresh water.
- The condition of the downgradient monitoring wells has declined. Since monitoring began in 1997, wells MW-22, MW-23, and MW-24 have been decommissioned. The reliability of data collected from these wells was unknown, due to the uneven subsidence of the wells protective casings and concrete pads that were bending the well casings. At this time, only one of the original wells (MW-25) is suitable to be sampled. Well MW-26 has been added to the sampling network for the remainder of the monitoring period. The downgradient monitoring network will be evaluated in the spring of 2001 at the completion of five years of sampling.

References

Ecology, 1994. Manchester Environmental Laboratory - Laboratory Users Manual. Washington State Department of Ecology, Manchester, WA.

Marti, P., 1999. American Crossarm and Conduit Monitoring Results – January 6-7, September 9-10, and December 9-10, 1997. Publication No. 99-321. Environmental Investigations and Laboratory Services Program, Washington State Department of Ecology, Olympia, WA.

Marti, P., 1999. American Crossarm and Conduit Monitoring Results – May 5 and October 14, 1998. Publication No. 99-341. Environmental Assessment Program, Washington State Department of Ecology, Olympia, WA.

Marti, P., 1999. American Crossarm and Conduit Monitoring Results – June 22, 1999. Publication No. 99-343. Environmental Assessment Program, Washington State Department of Ecology, Olympia, WA.

U.S. EPA, 1984. Chemical Testing Methods for Complying with the Dangerous Waste Regulations, SW-846. Chapter 173-303 WAC, March 1984, WDOE 83-13.

U.S. EPA, 1986. Test Methods for Evaluating Solid Waste, SW-846. Office of Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

U.S. EPA, 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule. 40 CFR Part 131, Volume 57, No. 246.

U.S. EPA, 1993. American Crossarm and Conduit, Record of Decision. U.S. Environmental Protection Agency.

Weston, Inc., 1992. Remedial Investigation and Feasibility Study (RI/FS) Report, American Crossarm and Conduit Chehalis, Washington.

Appendix A

Groundwater and Surface Water Sampling

Groundwater and surface water samples were collected on September 29, 1999 from two downgradient monitoring wells, MW-24 and MW-25, and two on-site surface water stations, ACCSW1 and ACCSW2. On June 8, 2000 samples were collected from well MW-25 and stations ACCSW1 and ACCSW2. Monitoring well MW-24 was not sampled in June since data from this well may not be reliable. Various site conditions (ground subsidence, and site filling and grading) have rendered wells MW-22, MW-23, and MW-24 unusable. MW-23 was decommissioned in the fall of 1998. MW-22 and MW-24 were decommissioned in the fall of 2000.

The four monitoring wells were sampled using standard sampling techniques. Prior to sample collection, static water level measurements were recorded to 0.01 feet using an electronic water level probe. The probe was rinsed with deionized water after each use. All wells were purged and sampled using a stainless steel submersible pump with a pump rate of about 0.5-gpm. Samples were collected when pH, temperature, and specific conductance readings stabilized (changes of 10% or less between measurements). The pump was decontaminated between wells by circulating laboratory grade detergent/water through the pump for five minutes, followed by a clean water rinse. Purge water was discharged to the ground near each well. All samples for PAHs and chlorinated phenolics were collected in 1-gallon jars with Teflon lined lids.

Two surface water samples were collected to determine if on-site wetlands are receiving any contaminants from the former facility. The samples were collected from two areas considered representative of the site. The first sample location was at the outlet of a small seasonal pond which received surface runoff from the north half of the site. The second sample location was at a wetland area at the south end of the site, adjacent to the landfill. This station should represent runoff from most of the site, which would include possible leachate from the landfill. Surface water samples were collected using decontaminated stainless steel beakers, and transferred to 1-gallon sample jars. The surface water was assumed to be fully mixed and the sample collected at mid-depth and as close to the center of flowing water as could be reached from the bank. Temperature, pH, and specific conductance were measured at the time each sample was collected.

Upon sample collection and proper labeling, samples were stored in an ice-filled cooler. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Ecology, 1994). The Ecology/EPA Laboratory in Manchester analyzed all samples.

Appendix B

Quality Assurance

MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E., Port Orchard Washington 98366

December 20, 2000

Subject: American Crossarm and Conduit
Samples: 99398005 - 009
Project ID: 231199
Project Officer: Pam Marti
By: Greg Perez

SEMIVOLATILE ORGANICS

ANALYTICAL METHODS:

The samples were extracted following the EPA CLP and SW-846 8270 procedure. Analysis was by capillary gas chromatography with mass spectrometry (GC/MS) Single Ion Monitoring mode. Extracts were treated with silica gel to remove interferences.

HOLDING TIMES:

The samples were stored at 4 degrees C until extraction. They were extracted and analyzed within the recommended holding times.

BLANKS:

Low levels of some analytes were detected in the laboratory blanks. An analyte is considered native to the sample when the on-column concentration is at least five times greater than in the associated method blanks.

SURROGATES:

The standard Manchester Laboratory Base/Neutral/Acid (BNA) surrogates were added to the sample prior to extraction. All surrogate recoveries for the sample were within acceptable limits.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

Matrix spikes recoveries were within acceptable limits. 1-methyl naphthalene and retene were not in the spiking solution and have been marked NAF.

COMMENTS:

The data is acceptable for use as reported.

DATA QUALIFIER CODES:

- U - The analyte was not detected at or above the reported value.
- J - The analyte was positively identified. The associated numerical value 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 - There is evidence the analyte is present in the sample.
- NJ - There is evidence that the analyte is present. The associated numerical result is an estimate.
- E - This qualifier is used when the concentration of the associated value exceeds the known calibration range. The associated numerical result is an estimate.
- bold** - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard Washington 98366

CASE NARRATIVE

October 19, 1999

Subject: American Crossarm and Conduit Project

Sample(s): 99398005-09

Officer(s): Pam Marti

By: Bob Carrell
Organics Analysis Unit

CHLORINATED PHENOLS ANALYSIS

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

These water samples for chlorinated phenols were extracted following Manchester Laboratory's standard operating procedure for the extraction of phenolic compounds (EPA method 8041). The samples (and two method blanks) were first acidified to a pH of less than 2, then extracted with methylene chloride and solvent 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, thus demonstrating that the system was free from contamination.

SURROGATES:

The 2,4,6-tribromophenol surrogate recoveries were acceptable, ranging from 85% to 136%.

MATRIX SPIKING:

Recoveries of the matrix spike analytes were acceptable, ranging from 88% to 102%. The relative percent differences (RPD's) between the analyte recoveries for the matrix and matrix spike duplicates were also acceptable.

COMMENTS:

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.

MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E, Port Orchard Washington 98366

CASE NARRATIVE

July 13, 2000

Subject: American Crossarm
Samples: 00-238001 to -238004
Case No. 3045-00
Officer: Pam Marti
By: Dickey D. Huntamer
Organics Analysis Unit

POLYNUCLEAR AROMATIC HYDROCARBONS

ANALYTICAL METHODS:

The semivolatile water samples were solvent extracted with methylene chloride following the Manchester modification of the EPA SW 846 8270 with capillary GC/MS analysis of the sample extracts.

HOLDING TIMES:

All analysis-holding times were within the recommended limits.

BLANKS:

Low levels of some target compounds were detected in the laboratory blanks. Compounds that were found in the sample and in the blank were considered native to the sample if the area counts in the sample are greater than or equal to five times the area counts in the associated method blank.

SURROGATES:

The surrogate compound recoveries were within acceptable limits.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

No matrix spikes were analyzed with the samples.

ANALYTICAL COMMENTS:

No significant problems were encountered in the analysis. The data is acceptable as qualified

DATA QUALIFIER CODES:

- U - The analyte was not detected at or above the reported value.
- J - The analyte was positively identified. The associated numerical value 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.
- E - This qualifier is used when the concentration of the associated value exceeds the known calibration range.
- Bold** - The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard Washington 98366

CASE NARRATIVE

July 14, 2000

Subject: American Crossarm and Conduit Project

Sample(s): 00238001-04

Officer(s): Pam Marti

By: Bob Carrell
Organics Analysis Unit

CHLORINATED PHENOLS ANALYSIS

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

These water samples for chlorinated phenols were extracted following Manchester Laboratory's standard operating procedure for the extraction of phenolic compounds (EPA method 8041). The samples (and two method blanks) were first acidified to a pH of less than 2, then extracted with methylene chloride and solvent 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, thus demonstrating that the system was free from contamination.

SURROGATES:

The 2,4,6-tribromophenol surrogate recoveries were acceptable, ranging from 69% to 84%.

MATRIX SPIKING:

N/A

COMMENTS:

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.

Appendix C
Historical Data

Summary of Analytes Detected (ug/L) at American Crossarm and Conduit on January 1997

Sample Station	MW-22	MW-25	MW-23	MW-24	MW-24A (Duplicate)	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons</u>							
Naphthalene	0.014 U	0.032	0.12	0.069	0.043	0.061	0.015
Acenaphthylene	0.0074 U	0.0078 U	0.0051 J	0.0077 U	0.0075 U	0.019	0.0057 J
Acenaphthene	0.0074 U	0.0078 U	0.0014 J	0.0077 U	0.00094 J	0.06	0.0058 J
Fluorene	0.0074 U	0.0037 J	0.014	0.0097	0.004 J	0.04	0.0055 J
Phenanthrene	0.0035 J	0.012	0.039	0.022	0.0099 J	0.03	0.0085
Anthracene	0.0074 U	0.0023 J	0.0032 J	0.0037 J	0.0028 J	0.035	0.016
Sum LPAH	0.0035 J	0.05 J	0.1827	0.1044 J	0.06064 J	0.245	0.0565 J
Fluoranthene	0.0074 U	0.0012 J	0.0068 J	0.0055 J	0.0021 J	0.042	0.012
Pyrene	0.0074 U	0.0078 U	0.0055 J	0.028	0.0075 U	0.041	0.012
Benzo(a)anthracene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0061 J	0.00067 J
Chrysene	0.0074 U	0.0078 U	0.0027 J	0.0025 J	0.0075 U	0.014	0.0037 J
Benzo(b)fluoranthene	0.0074 U	0.0078 U	0.019 U	0.019 U	0.019 U	0.0071 J	0.019 U
Benzo(k)fluoranthene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0078 U	0.0078 U
Benzo(a)pyrene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0024 J	0.0078 U
Indeno(1,2,3-cd)pyrene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0023 J	0.0078 U
Dibenzo(a,h)anthracene	0.018 U	0.02 U	0.019 U	0.019 U	0.019 U	0.02 U	0.019 U
Benzo(g,h,i)perylene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0025 J	0.0078 U
Sum HPAH	0.0074 U	0.0012 J	0.015 J	0.036 J	0.0021 J	0.1174 J	0.02837 J
2-Methylnaphthalene	0.0097 J	0.017 J	0.029	0.007 J	0.0078 J	0.022	0.0053 U
1-Methylnaphthalene	0.0038 J	0.007 J	0.015 J	0.0094 J	0.0057 J	0.031	0.0034 J
2-Chloronaphthalene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0078 U	0.0078 U
Dibenzofuran	0.0074 U	0.0078 U	0.00095 U	0.0077 U	0.00033 U	0.021	0.0024 J
Retene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0062 J	0.00086 J
<u>Chlorinated Phenolics</u>							
2,4,6-Trichlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
2,4,5-Trichlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
2,3,4,6-Tetrachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.13	0.071
2,3,4,5-Tetrachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
Pentachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.58	0.35

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.

Summary of Analytes Detected (ug/L) at American Crossarm and Conduit on September/December 1997

Sample Station	MW-22	MW-25	MW-23	MW-24	MW-24A (Duplicate)	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons¹</u>							
Naphthalene	0.0071 U	0.01	0.014	0.0067 U	0.0064 U	0.29	0.12
Acenaphthylene	0.0066 U	0.0063 U	0.00056 J	0.0067 U	0.0064 U	0.013	0.0053 J
Acenaphthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.4	0.11
Fluorene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.18	0.051
Phenanthrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.065	0.024
Anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.11	0.029
Sum LPAH	0.0066 U	0.01	0.01456 J	0.0067 U	0.0064 U	1.058	0.3393 J
Fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.23	0.031
Pyrene	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.16	0.021
Benzo(a)anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.021	0.0029 J
Chrysene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.031	0.0037 J
Benzo(b)fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.018 J	0.0031 J
Benzo(k)fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.0064 J	0.0011 J
Benzo(a)pyrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.013	0.0018 J
Indeno(1,2,3-cd)pyrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.0073	0.0012 J
Dibenzo(a,h)anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.0012 J	0.0064 U
Benzo(ghi)perylene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.007	0.0016 J
Sum HPAH	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.4949 J	0.0674 J
2-Methylnaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.14	0.035
1-Methylnaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.16	0.043
2-Chloronaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.0064 U	0.0065 U
Dibenzofuran	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.1	0.026
Retene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.017	0.0024 J
<u>Chlorinated Phenolics²</u>							
2,4,6-Trichlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
2,4,5-Trichlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
2,3,4,6-Tetrachlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.008	0.004
2,3,4,5-Tetrachlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Pentachlorophenol (PCP)	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.007 J	0.005 J

¹ U = The analyte was not detected at or above the reported value.

¹ = PAH results from samples collected in December 1997.

J = The analyte was positively identified. The associated numerical value is an estimate.

² = Chlorinated phenolic results from samples collected in September 1997.

Summary of Analytes Detected (ug/L) at American Crossarm and Conduit in May 1998

Sample Station	MW-22	MW-25	MW-23	MW-24	MW-24A (Duplicate)	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons</u>							
Naphthalene	0.015 0.0066 U	0.017 0.0064 U	0.015 0.0068 U	0.012 0.0066 U	0.012 0.0066 U	0.21 0.0065 U	0.11 0.0065 U
Acenaphthylene	0.0026 J 0.0064 U	0.0064 U	0.0033 J 0.0064 U	0.0066 U	0.0066 U	0.22 0.0066 U	0.12 0.0066 U
Acenaphthene	0.0028 J 0.0064 U	0.0064 U	0.0033 J 0.0064 U	0.0066 U	0.0066 U	0.13 0.0066 U	0.096 0.0066 U
Fluorene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.16 0.0066 U	0.11 0.0066 U
Phenanthrene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.073 0.0066 U	0.036 0.0066 U
Anthracene	0.0204 J 0.0033 U	0.017 0.0032 U	0.0216 J 0.0034 U	0.012 0.0033 U	0.012 0.0033 U	0.793 0.24	0.472 0.047
Sum LPAH							
Fluoranthene	0.0033 U	0.0032 U	0.0034 U	0.0033 U	0.0033 U	0.24 0.0066 U	0.047 0.024
Pyrene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.12 0.0066 U	0.024 0.0066 U
Benzo(a)anthracene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.019 0.0066 U	0.0057 J 0.0066 U
Chrysene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.026 0.0066 U	0.0062 J 0.0066 U
Benzo(b)fluoranthene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.02 0.0066 U	0.0073 J 0.0066 U
Benzo(k)fluoranthene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.0066 J 0.0066 U	0.0037 J 0.0066 U
Benzo(a)pyrene	0.0033 U	0.0032 U	0.0034 U	0.0033 U	0.0033 U	0.006 J 0.0033 U	0.0043 J 0.0032 U
Ideno(1,2,3-cd)pyrene	0.0033 U	0.0032 U	0.0034 U	0.0033 U	0.0033 U	0.0078 J 0.0032 U	0.0032 U
Dibenzo(a,h)anthracene	0.0033 U	0.0032 U	0.0034 U	0.0033 U	0.0033 U	0.0032 U	0.0032 U
Benzo(ghi)perylene	0.0033 U	0.0032 U	0.0034 U	0.0033 U	0.0033 U	0.0069 J 0.0033 U	0.0032 U
Sum HPAH	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.4523 J 0.089	0.0982 J 0.031
2-Methylnaphthalene	0.01 0.0054	0.012 0.0062	0.01 0.0054	0.0098 0.0049	0.01 0.0053	0.089 0.08	0.031 0.026
1-Methylnaphthalene	0.0066 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U	0.0065 U	0.0065 U
2-Chloronaphthalene	0.0033 U	0.0032 U	0.0026 J 0.0068 U	0.0033 U	0.0033 U	0.082 0.024	0.066 0.021
Dibenzofuran	0.0034 J 0.024 U	0.0064 U	0.0068 U	0.0066 U	0.0066 U		
Retene	0.024 U	0.024 U	0.025 U	0.024 U	0.024 U	0.018 J 0.0065 J	0.013 J 0.013 NJ
<u>Chlorinated Phenolics</u>							
2,4,6-Trichlorophenol	0.024 U	0.024 U	0.023 U	0.022 U	0.022 U	0.093 0.022 U	0.068 0.023 U
2,4,5-Trichlorophenol	0.022 U	0.022 U	0.023 U	0.022 U	0.022 U	0.022 U	0.023 U
2,3,4,6-Tetrachlorophenol	0.022 U	0.022 U	0.023 U	0.022 U	0.022 U	0.022 U	0.023 U
2,3,4,5-Tetrachlorophenol	0.022 U	0.022 U	0.023 U	0.022 U	0.022 U	0.022 U	0.023 U
Pentachlorophenol	0.0033 J 0.02 U	0.02 U	0.021 U	0.02 U	0.02 U	0.02 U	0.021 U

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.

NJ = There is evidence that the analyte is present. The associated numerical result is an estimate.

Summary of Analytes Detected (ug/L) at American Crossarm and Conduit in October 1998

Sample Station	MW-22	MW-22A (Duplicate)	MW-24	MW-25	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons</u>						
Naphthalene	0.02 0.0062 U	0.015 0.0063 U	0.014 0.0063 U	0.027 0.0062 U	0.044 0.0063 U	0.24 0.0063 U
Acenaphthylene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.5	0.19
Acenaphthene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.044	0.15
Fluorene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.018	0.096
Phenanthrene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.11	0.029
Anthracene	0.0062 U	0.0063 U	0.0063 U	0.0062 U		
Sum LPAH	0.02	0.015	0.014	0.027	0.716	0.705
Fluoranthene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.46	0.039
Pyrene	0.012 U	0.012 U	0.012 U	0.012 U	0.36	0.022
Benzo(a)anthracene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.043	0.0042 J
Chrysene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.073	0.0072
Benzo(b)fluoranthene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.047	0.007
Benzo(k)fluoranthene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.014	0.0026
Benzo(a)pyrene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.02	0.0049
Ideno(1,2,3-cd)pyrene	0.012 U	0.012 U	0.012 U	0.012 U	0.015	0.0063 U
Dibenzo(a,h)anthracene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.0063 U	0.0063 U
Benzo(ghi)perylene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.014 J	0.0039 J
Sum HPAH	0.0062 U	0.0063 U	0.0063 U	0.0062 U	1.046 J	0.908 J
2-Methylnaphthalene	0.022	0.014	0.014	0.026	0.018	0.048
1-Methylnaphthalene	0.0097	0.0058 J	0.0063 U	0.011	0.043	0.046
Dibenzofuran	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.07	0.091
Retene	0.0062 U	0.0063 U	0.0063 U	0.0062 U	0.027	0.0063 U
<u>Chlorinated Phenolics</u>						
2,4,6-Trichlorophenol	0.047 U	0.047 U	0.048 U	0.047 U	0.049 U	0.047 U
2,4,5-Trichlorophenol	0.047 U	0.047 U	0.048 U	0.047 U	0.0016 NJ	0.047 U
2,3,4,6-Tetrachlorophenol	0.043 U	0.043 U	0.044 U	0.043 U	0.0049 NJ	0.016 NJ
2,3,4,5-Tetrachlorophenol	0.043 U	0.043 U	0.044 U	0.043 U	0.045 U	0.043 U
Pentachlorophenol	0.0031 J	0.0031 NJ	0.04 U	0.039 U	0.17	0.024 NJ

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.

NJ = There is evidence that the analyte is present. The associated numerical result is an estimate.

Summary of Analytes Detected (ug/L) at American Crossarm and Conduit in June 1999

Sample Station	MW-24	MW-24A (Duplicate)	MW-25	ACCSW1	ACCSW2
<u>Polynuclear Aromatic Hydrocarbons</u>					
Naphthalene	0.0063 U	0.0063 U	0.0063 U	0.088	0.099
Acenaphthylene	0.0032 U	0.0032 U	0.0032 U	0.0066	0.0051
Acenaphthene	0.0032 U	0.0032 U	0.00014 J	0.24	0.12
Fluorene	0.0032 U	0.0032 U	0.0032 U	0.15	0.086
Phenanthrene	0.0063 U	0.0063 U	0.0063 U	0.22	0.096
Anthracene	0.0063 U	0.0063 U	0.0063 U	0.074	0.035
Sum LPAH	0.0063 U	0.0063 U	0.00014 J	0.7786	0.4411
Fluoranthene	0.0063 U	0.0063 U	0.0063 U	0.18	0.041
Pyrene	0.0063 U	0.0063 U	0.0063 U	0.11	0.018
Benzo(a)anthracene	0.0063 U	0.0063 U	0.0063 U	0.017	0.0077
Chrysene	0.0063 U	0.0063 U	0.0063 U	0.024	0.0067
Benzo(b)fluoranthene	0.0063 U	0.0063 U	0.0063 U	0.012	0.0041 J
Benzo(k)fluoranthene	0.013 U	0.013 U	0.013 U	0.012 J	0.0084 J
Benzo(a)pyrene	0.0063 U	0.0063 U	0.0063 U	0.01	0.0076
Ideno(1,2,3-cd)pyrene	0.013 U	0.013 U	0.013 U	0.018	0.013 U
Dibenzo(a,h)anthracene	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U
Benzo(ghi)perylene	0.0063 U	0.0063 U	0.0063 U	0.014 J	0.0063 U
Sum HPAH	0.0063 U	0.0063 U	0.0063 U	0.397 J	0.0935 J
2-Methylnaphthalene	0.0063 U	0.0063 U	0.0063 U	0.1	0.03
1-Methylnaphthalene	0.0063 U	0.0063 U	0.0063 U	0.088	0.037
Dibenzofuran	0.0063 U	0.0063 U	0.0063 U	0.066	0.043
Retene	0.0063 U	0.0063 U	0.0063 U	0.018	0.0063 U
<u>Chlorinated Phenolics</u>					
2,4,6-Trichlorophenol	0.05 U	0.049 U	0.048 U	0.049 U	0.049 U
2,4,5-Trichlorophenol	0.05 U	0.049 U	0.048 U	0.049 U	0.049 U
2,3,4,6-Tetrachlorophenol	0.046 U	0.045 U	0.044 U	0.045 U	0.045 U
2,3,4,5-Tetrachlorophenol	0.046 U	0.045 U	0.044 U	0.045 U	0.045 U
Pentachlorophenol	0.041 U	0.041 U	0.04 U	0.04 U	0.041 U

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.