A Department of Ecology Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

# American Crossarm and Conduit Monitoring Results - June 22, 1999


## Abstract

This document is one in a series describing the results of groundwater and surface water monitoring at the American Crossarm and Conduit (ACC) site. Samples were collected on June 22, 1999 from two of the four downgradient monitoring wells (MW-24 and MW-25) and two on-site surface water stations (ACCSW1 and ACCSW2). Monitoring wells MW-22 and MW-23, which were part of the original monitoring network, are no longer sampled because they have been damaged. In 1998, well MW-23 was decommissioned. The well casing of MW-22 is bending under the weight of the protective casing and concrete pad due to the uneven subsidence of the surrounding ground. Since the well casing may be cracked, samples collected from this well are no longer considered reliable. All samples collected for this project were analyzed for polynuclear aromatic hydrocarbons (PAHs) and chlorinated phenolics.

In June, acenaphthene was detected in well MW-25 at an estimated concentration of 0.00014 µg/L. This is the only PAH detected in either of the sampled wells. Acenaphthene is not classified as a carcinogen and therefore does not exceed any of the cleanup standards that are applicable to this project. Chlorinated phenolics were not detected in either of the wells during this round of sampling.

Most of the PAHs analyzed for were detected at both surface water stations. All detected analytes in the surface water samples were far below established water quality criteria for fresh water (EPA, 1992).


## Background

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 the National Priorities List due to noncompliance of waste handling requirements, which resulted in the contamination of both on- and off-site soil, ground water 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 U.S. Environmental Protection Agency (EPA), consisted of the reduction of floating product on groundwater beneath the facility, off-site disposal of facility structures and the most contaminated soil as well as containment of the remaining contaminated soil on the facility property.


*by Pamela B. Marti*


*Waterbody No. WA-1229829466607GW*
*Ecology Report #99-343*
*October 1999*

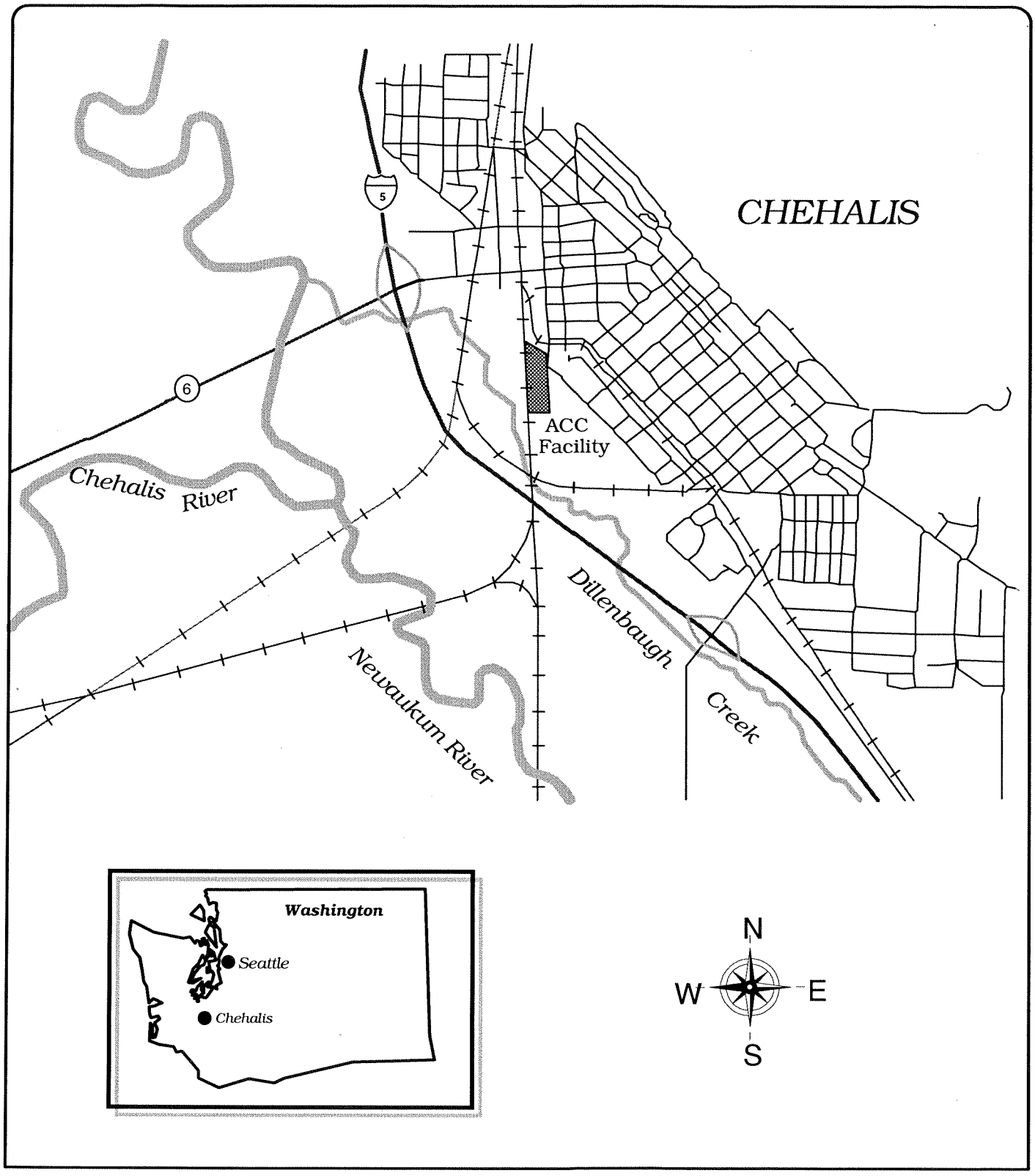


Figure 1: American Crossarm & Conduit Site Location

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.

# Results

Samples were collected on June 22, 1999 from two downgradient monitoring wells (MW-24 and MW-25) and two on-site surface water stations (ACCSW1 and ACCSW2) (Figure 2). Monitoring wells MW-22 and MW-23, which were part of the original monitoring network, are no longer sampled because they have been damaged. MW-23 was decommissioned in the fall of 1998. Sampling procedures are discussed in Appendix A. All samples collected for this project were analyzed for polynuclear aromatic hydrocarbons (PAHs) and chlorinated phenolics. The quality of the data is acceptable for use for both sample rounds. Discussion of quality assurance along with the laboratory reporting sheets is presented in Appendix B.

## Field Observations

Table 1 lists field observations for each sample location including well depth, static water level, pH, specific conductance, temperature, and purged volume. All field parameters were within expected ranges.

**Table 1. Summary of Field Parameters Results for June 22, 1999**

| | *MW-22* | *MW-25* | *MW-24* | *ACCSW1* | *ACCSW2* |
|---|---|---|---|---|---|
| Total Depth (feet) | 35.73 | 39.85* | 42.90* | --- | --- |
| Depth to Water (feet) | --- | 3.20 | 3.37 | --- | --- |
| pH (standard units) | --- | 6.9 | 7.0 | 8.5 | 6.9 |
| Specific Conductance (umhos/cm) | --- | 450 | 475 | 251 | 455 |
| Temperature (°C) | --- | 16.0 | 15.0 | 22.9 | 19.2 |
| Purge Volume (gal) | --- | 18 | 17 | --- | --- |

* Approximately 4 inches were removed from these well casings because subsidence of the protective casing was blocking the well tops.

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 is causing the well casing to bend. Since the well casing may be cracked, this well should no longer be sampled since the data collected may not be reliable. In addition, the property where the wells are located is being filled and graded. In 1998, well MW-23 was damaged while the property was being cleared, and subsequently has been decommissioned.

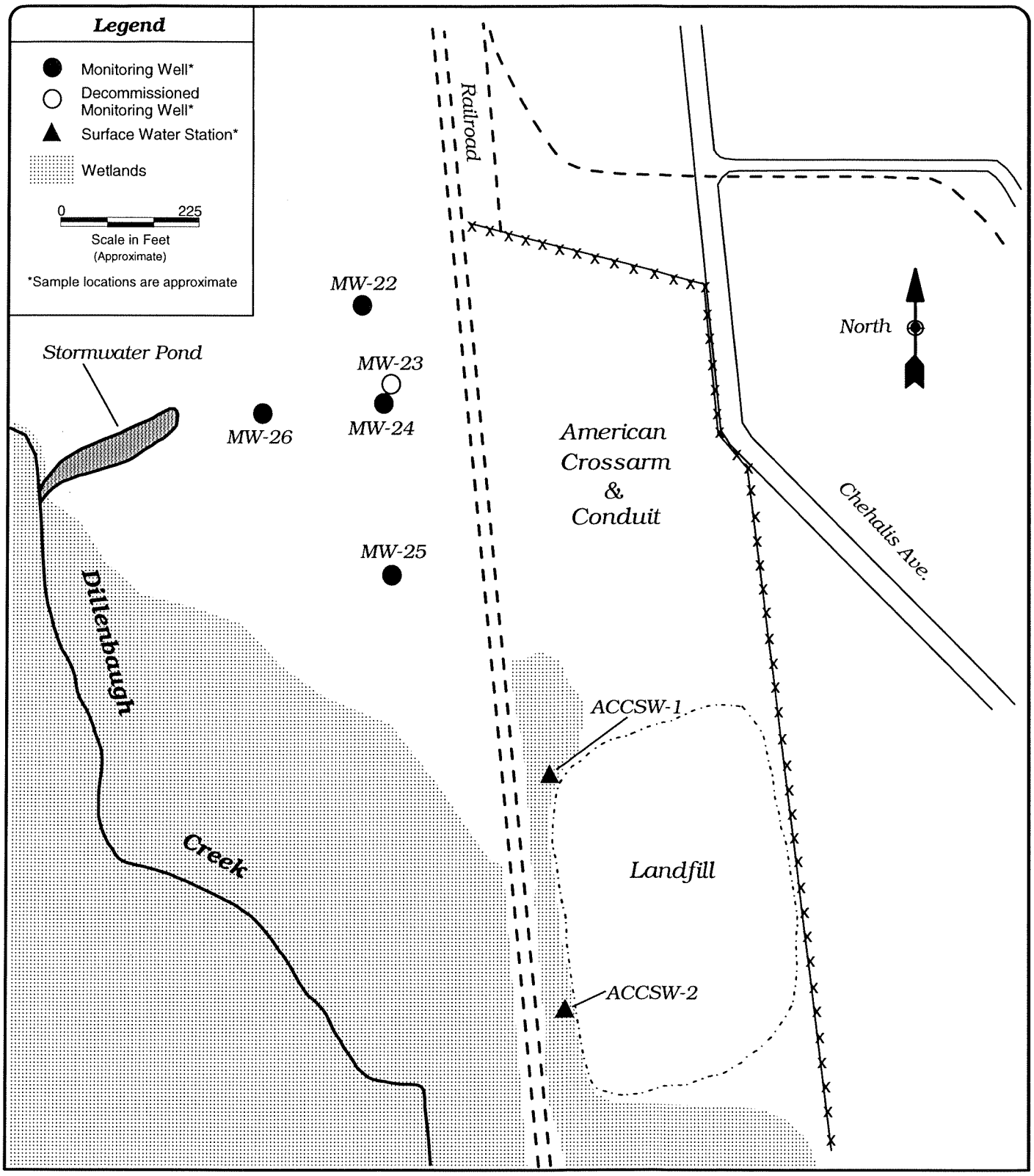


Figure 2: American Crossarm & Conduit Sample Locations

## Analytical Results

All samples were analyzed for polynuclear aromatic hydrocarbons (PAHs) and chlorinated phenolics. PAHs were analyzed using EPA SW846 Method 8270 by SIM (Select Ion Monitoring) with a method detection limit of about 0.1 µg/L. Chlorinated phenolics were analyzed using EPA SW846 Method 8150 (modified) with a method detection limit of 0.01-1.0 µg/L. The detection limits achieved are generally lower then the stated method detection limit, which is required for this project to meet cleanup standards. Analytical results for June 1999 are summarized in Table 2. PAH results have been grouped into low PAH (LPAH) and high PAH (HPAH) based on their molecular weights in relation to fluoranthene. Analytical data from 1997 and 1998 are presented in Appendix C.

In June, acenaphthene was the only PAH detected in well MW-25 at an estimated concentration of 0.00014 µg/L. Chlorinated phenolics were not detected in either of the wells during this round of sampling.

Most of the PAHs analyzed for were detected at both surface water stations. Table 3 shows the sum of both the low and high molecular weight PAHs. 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 resolubalized into the water column. It was expected that MTCA Method A cleanup standards of 0.1 µg/L for carcinogenic PAHs (CPAHs) in groundwater would be met at the facility boundary due to these processes.

In June, acenaphthene was the only PAH detected in one of the sampled monitoring wells. Acenaphthene is not classified as a carcinogen and therefore does 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 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 (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.

Table 2: 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 |
|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons** | | | | | |
| 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 |
| **Chlorinated Phenolics** | | | | | |
| 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.

**Table 3. Summary of PAH Results (µg/L) in Surface Water for June 22, 1999**

| | *June 1999* | |
|---|---|---|
| | *ACCSW1* | *ACCSW2* |
| LPAH | 0.7786 | 0.4411 |
| HPAH | 0.397 J | 0.0935 J |

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

Chlorinated phenolics were not detected in either of the wells during this round of sampling; 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 adjacent to a railroad track, the occurrence of PAHs in the surface water samples is not unexpected. In June, the sum of the LPAH and HPAH decreased from the upstream station (ACCSW1) to the downstream station (ACCSW2). In the environment, PAHs can volatilize, become fixed to sediments, biodegrade, or be photo-oxidized. The physical and chemical properties of different PAHs vary greatly with respect to their varying molecular weights. 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 4.

**Table 4. Summary of Water Quality and Human Health Criteria for Fresh Water (µg/L).**

| | Priority Pollutant | Carcinogen | Fresh Acute Criteria | Fresh Chronic Criteria | Human Health Criteria |
|---|---|---|---|---|---|
| **PAHs** | | | | | |
| Naphthalene | Y | N | 2,300 | 620 | |
| 2-Chloronaphthalene | Y | N | 1,600 | | |
| Acenapthene | 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 |
| **Chlorinated Phenolics** | | | | | |
| 2,4,6-Trichlorophenol | Y | Y | | 970 | 2.10 |
| 2,4,5-Trichlorophenal | 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 Recommendations

- In June 1999, acenaphthene was the only PAH detected in either of the sampled 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 to 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 adjacent to a railroad track, the occurrence of PAHs in the surface water samples is expected. 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 is in decline. The monitoring wells were constructed in an area that has several feet of fill composed of wood chips and bark. This material is now compressing and/or decomposing which is causing the wells protective outer casings and concrete pads to sink below the well tops and, in the case of MW-22, bend the well casing. It is uncertain how long the integrity of the wells will last under these conditions. Well MW-23 was decommissioned in October 1998. The downgradient monitoring network should be evaluated.

## References

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

## Contacts

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# Appendix A

# Sampling Methods

## Sampling Methods

Groundwater and surface water samples were collected on June 22, 1999. Samples were collected from downgradient wells MW-24 and MW-25 and two on-site surface water stations, ACCSW1 and ACCSW2 (Figure 2). Monitoring wells MW-22 and MW-23, which were part of the original monitoring network, are no longer sampled because they have been damaged. MW-23 was decommissioned in the fall of 1998.

In June, sampling procedures were changed due to limited access to the property where the wells are located. 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. The two wells were purged and sampled using decontaminated teflon bailers, in place of the low-flow stainless steel submersible pump. Samples were collected when pH, temperature, and specific conductance readings stabilized (changes of 10% or less between measurements), and a minimum of three well volumes had been removed. 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.

The teflon bailers were pre-cleaned with sequential washes of Liquinox®, hot tap water, 10% nitric acid, distilled-deionized water, and pesticide-grade acetone. After cleaning, bailers were air-dried and wrapped in aluminum foil.

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).

# Appendix B

# Quality Assurance Samples

## Quality Assurance Samples

In general, the quality of the data is acceptable for use for all sample rounds. Quality control samples collected in the field consisted of blind duplicate sample. A blind duplicate sample was collected from well MW-24A. Duplicate samples provide an estimate of combined sampling and laboratory precision. The numeric comparison of duplicate results is expressed as the relative percent difference or RPD. RPDs are the ratio of the difference and the mean of the duplicate results expressed as a percentage. The RPDs could not be calculated since there were no detections in either to the samples.

In addition to field quality control samples: laboratory blanks, 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. The laboratory reported that due to laboratory procedures the detected results in the samples are real and do not require qualification, even though the target analytes were detected in the laboratory blanks. Surrogate compound recoveries, as well as matrix spike results, were within acceptable limits.

**MANCHESTER ENVIRONMENTAL LABORATORY**
7411 Beach Drive E. , Port Orchard Washington 98366

**August 5, 1999**

| | |
|---|---|
| Subject: | American Crossarm and Conduit |
| Samples: | 99258021 |
| Project ID: | 153299 |
| 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). No cleanup of the extracts was necessary.

### 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. A phthalate is considered native to the sample when the concentration is at least ten 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.

### 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

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258021 **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** MW-25 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| Naphthalene | .0063 | U |
| 2-Methylnaphthalene | .0063 | U |
| 1-Methylnaphthalene | .0063 | U |
| 2-Chloronaphthalene | .0032 | U |
| Acenaphthylene | .0032 | U |
| **Acenaphthene** | **.00014** | **J** |
| Dibenzofuran | .0063 | U |
| Fluorene | .0032 | U |
| Phenanthrene | .0063 | U |
| Anthracene | .0063 | U |
| Fluoranthene | .0063 | U |
| Pyrene | .0063 | U |
| Retene | .0063 | U |
| Benzo(a)anthracene | .0063 | U |
| Chrysene | .0063 | U |
| Benzo(b)fluoranthene | .0063 | U |
| Benzo(k)fluoranthene | .013 | U |
| Benzo(a)pyrene | .0063 | U |
| Indeno(1,2,3-cd)pyrene | .013 | U |
| Dibenzo(a,h)anthracene | .0063 | U |
| Benzo(ghi)perylene | .0063 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **78** | **%** |
| **Pyrene-D10** | **90** | **%** |
| **Terphenyl-D14** | **91** | **%** |

Authorized By: _____ Release Date: 8/6/99 Page: 1

# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258021 (Matrix Spike - LMX1) **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** MW-25 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** % Recovery

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **61** | |
| **2-Methylnaphthalene** | **72** | |
| 1-Methylnaphthalene | | NAF |
| **2-Chloronaphthalene** | **68** | |
| **Acenaphthylene** | **75** | |
| **Acenaphthene** | **74** | |
| **Dibenzofuran** | **78** | |
| **Fluorene** | **81** | |
| **Phenanthrene** | **89** | |
| **Anthracene** | **86** | |
| **Fluoranthene** | **96** | |
| **Pyrene** | **95** | |
| Retene | | NAF |
| **Benzo(a)anthracene** | **103** | |
| **Chrysene** | **95** | |
| **Benzo(b)fluoranthene** | **96** | |
| **Benzo(k)fluoranthene** | **93** | |
| **Benzo(a)pyrene** | **94** | |
| **Indeno(1,2,3-cd)pyrene** | **107** | |
| **Dibenzo(a,h)anthracene** | **158** | |
| **Benzo(ghi)perylene** | **112** | |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **60** | % |
| **Pyrene-D10** | **91** | % |
| **Terphenyl-D14** | **95** | % |

Authorized By: _____ Release Date: 8/6/99

# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258021 (Matrix Spike - LMX2) **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** MW-25 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** % Recovery

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **68** | |
| **2-Methylnaphthalene** | **77** | |
| 1-Methylnaphthalene | | NAF |
| **2-Chloronaphthalene** | **72** | |
| **Acenaphthylene** | **79** | |
| **Acenaphthene** | **77** | |
| **Dibenzofuran** | **84** | |
| **Fluorene** | **83** | |
| **Phenanthrene** | **86** | |
| **Anthracene** | **84** | |
| **Fluoranthene** | **85** | |
| **Pyrene** | **87** | |
| Retene | | NAF |
| **Benzo(a)anthracene** | **98** | |
| **Chrysene** | **89** | |
| **Benzo(b)fluoranthene** | **89** | |
| **Benzo(k)fluoranthene** | **86** | |
| **Benzo(a)pyrene** | **87** | |
| **Indeno(1,2,3-cd)pyrene** | **126** | |
| **Dibenzo(a,h)anthracene** | **141** | |
| **Benzo(ghi)perylene** | **98** | |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **66** | **%** |
| **Pyrene-D10** | **87** | **%** |
| **Terphenyl-D14** | **89** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Lab ID:** OBW9176A1 **Method:** SW8270
**QC Type:** Laboratory Method Blank **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **.0088** | **J** |
| **2-Methylnaphthalene** | **.0094** | **J** |
| **1-Methylnaphthalene** | **.0074** | **J** |
| 2-Chloronaphthalene | .01 | U |
| Acenaphthylene | .01 | U |
| Acenaphthene | .01 | U |
| Dibenzofuran | .02 | U |
| **Fluorene** | **.0012** | **J** |
| Phenanthrene | .02 | U |
| Anthracene | .02 | U |
| **Fluoranthene** | **.012** | **J** |
| **Pyrene** | **.0045** | **J** |
| Retene | .02 | U |
| **Benzo(a)anthracene** | **.013** | **J** |
| **Chrysene** | **.0073** | **J** |
| **Benzo(b)fluoranthene** | **.0067** | **J** |
| **Benzo(k)fluoranthene** | **.023** | **J** |
| **Benzo(a)pyrene** | **.021** | |
| **Indeno(1,2,3-cd)pyrene** | **.046** | |
| **Dibenzo(a,h)anthracene** | **.048** | |
| **Benzo(ghi)perylene** | **.034** | |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **77** | **%** |
| **Pyrene-D10** | **102** | **%** |
| **Terphenyl-D14** | **99** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Lab ID:** OBW9176A2 **Method:** SW8270
**QC Type:** Laboratory Method Blank **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **.0081** | **J** |
| **2-Methylnaphthalene** | **.0096** | **J** |
| **1-Methylnaphthalene** | **.0073** | **J** |
| 2-Chloronaphthalene | .01 | U |
| Acenaphthylene | .01 | U |
| Acenaphthene | .01 | U |
| Dibenzofuran | .02 | U |
| **Fluorene** | **.0011** | **J** |
| Phenanthrene | .02 | U |
| Anthracene | .02 | U |
| **Fluoranthene** | **.012** | **J** |
| **Pyrene** | **.0042** | **J** |
| Retene | .02 | U |
| **Benzo(a)anthracene** | **.013** | **J** |
| **Chrysene** | **.0066** | **J** |
| **Benzo(b)fluoranthene** | **.0059** | **J** |
| **Benzo(k)fluoranthene** | **.022** | **J** |
| **Benzo(a)pyrene** | **.021** | |
| Indeno(1,2,3-cd)pyrene | .04 | U |
| Dibenzo(a,h)anthracene | .02 | U |
| Benzo(ghi)perylene | .02 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **73** | **%** |
| **Pyrene-D10** | **98** | **%** |
| **Terphenyl-D14** | **98** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258022 **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** MW-24 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| Naphthalene | .0063 | U |
| 2-Methylnaphthalene | .0063 | U |
| 1-Methylnaphthalene | .0063 | U |
| 2-Chloronaphthalene | .0032 | U |
| Acenaphthylene | .0032 | U |
| Acenaphthene | .0032 | U |
| Dibenzofuran | .0063 | U |
| Fluorene | .0032 | U |
| Phenanthrene | .0063 | U |
| Anthracene | .0063 | U |
| Fluoranthene | .0063 | U |
| Pyrene | .0063 | U |
| Retene | .0063 | U |
| Benzo(a)anthracene | .0063 | U |
| Chrysene | .0063 | U |
| Benzo(b)fluoranthene | .0063 | U |
| Benzo(k)fluoranthene | .013 | U |
| Benzo(a)pyrene | .0063 | U |
| Indeno(1,2,3-cd)pyrene | .013 | U |
| Dibenzo(a,h)anthracene | .0063 | U |
| Benzo(ghi)perylene | .0063 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **69** | **%** |
| **Pyrene-D10** | **91** | **%** |
| **Terphenyl-D14** | **92** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258023 **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** MW-24A **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| Naphthalene | .0063 | U |
| 2-Methylnaphthalene | .0063 | U |
| 1-Methylnaphthalene | .0063 | U |
| 2-Chloronaphthalene | .0032 | U |
| Acenaphthylene | .0032 | U |
| Acenaphthene | .0032 | U |
| Dibenzofuran | .0063 | U |
| Fluorene | .0032 | U |
| Phenanthrene | .0063 | U |
| Anthracene | .0063 | U |
| Fluoranthene | .0063 | U |
| Pyrene | .0063 | U |
| Retene | .0063 | U |
| Benzo(a)anthracene | .0063 | U |
| Chrysene | .0063 | U |
| Benzo(b)fluoranthene | .0063 | U |
| Benzo(k)fluoranthene | .013 | U |
| Benzo(a)pyrene | .0063 | U |
| Indeno(1,2,3-cd)pyrene | .013 | U |
| Dibenzo(a,h)anthracene | .0063 | U |
| Benzo(ghi)perylene | .0063 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **80** | % |
| **Pyrene-D10** | **94** | % |
| **Terphenyl-D14** | **97** | % |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258024 **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** ACCSW1 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **.088** | |
| **2-Methylnaphthalene** | **.1** | |
| **1-Methylnaphthalene** | **.088** | |
| 2-Chloronaphthalene | .0032 | U |
| **Acenaphthylene** | **.0066** | |
| **Acenaphthene** | **.24** | |
| **Dibenzofuran** | **.066** | |
| **Fluorene** | **.15** | |
| **Phenanthrene** | **.22** | |
| **Anthracene** | **.074** | |
| **Fluoranthene** | **.18** | |
| **Pyrene** | **.11** | |
| **Retene** | **.018** | |
| **Benzo(a)anthracene** | **.017** | |
| **Chrysene** | **.024** | |
| **Benzo(b)fluoranthene** | **.012** | |
| **Benzo(k)fluoranthene** | **.012** | **J** |
| **Benzo(a)pyrene** | **.01** | |
| **Indeno(1,2,3-cd)pyrene** | **.018** | |
| Dibenzo(a,h)anthracene | .0063 | U |
| **Benzo(ghi)perylene** | **.014** | |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **71** | **%** |
| **Pyrene-D10** | **85** | **%** |
| **Terphenyl-D14** | **78** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Polyaromatic Hydrocarbons (PNA's)

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258025 **Date Collected:** 06/22/99 **Method:** SW8270
**Field ID:** ACCSW2 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/14/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| **Naphthalene** | **.099** | |
| **2-Methylnaphthalene** | **.03** | |
| **1-Methylnaphthalene** | **.037** | |
| 2-Chloronaphthalene | .0032 | U |
| **Acenaphthylene** | **.0051** | |
| **Acenaphthene** | **.12** | |
| **Dibenzofuran** | **.043** | |
| **Fluorene** | **.086** | |
| **Phenanthrene** | **.096** | |
| **Anthracene** | **.035** | |
| **Fluoranthene** | **.041** | |
| **Pyrene** | **.018** | |
| Retene | .0063 | U |
| **Benzo(a)anthracene** | **.0077** | |
| **Chrysene** | **.0067** | |
| **Benzo(b)fluoranthene** | **.0041** | **J** |
| **Benzo(k)fluoranthene** | **.0084** | **J** |
| **Benzo(a)pyrene** | **.0076** | |
| Indeno(1,2,3-cd)pyrene | .013 | U |
| Dibenzo(a,h)anthracene | .0063 | U |
| Benzo(ghi)perylene | .0063 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2-Fluorobiphenyl** | **77** | **%** |
| **Pyrene-D10** | **88** | **%** |
| **Terphenyl-D14** | **87** | **%** |

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# Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard Washington 98366

## CASE NARRATIVE

**July 16, 1999**

Subject: American Crossarm Project

Sample(s): 99258021-25

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.

### 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.

### HOLDING TIMES:

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

### SURROGATES:

The 2,4,6-tribromophenol surrogate recoveries were acceptable, ranging from 42% to 93%.

**MATRIX SPIKING:**

Not applicable.

**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

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Lab ID:** OBW9176A1 **Method:** SW8041
**QC Type:** Laboratory Method Blank **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/01/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.050 | U |
| 2,4,5-Trichlorophenol | 0.050 | U |
| 2,3,4,6-Tetrachlorophenol | 0.046 | U |
| 2,3,4,5-Tetrachlorophenol | 0.046 | U |
| Pentachlorophenol | 0.042 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **85** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Lab ID:** OBW9176A2 **Method:** SW8041
**QC Type:** Laboratory Method Blank **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/01/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.050 | U |
| 2,4,5-Trichlorophenol | 0.050 | U |
| 2,3,4,6-Tetrachlorophenol | 0.046 | U |
| 2,3,4,5-Tetrachlorophenol | 0.046 | U |
| Pentachlorophenol | 0.042 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **42** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258021 **Date Collected:** 06/22/99 **Method:** SW8041
**Field ID:** MW-25 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/01/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.048 | U |
| 2,4,5-Trichlorophenol | 0.048 | U |
| 2,3,4,6-Tetrachlorophenol | 0.044 | U |
| 2,3,4,5-Tetrachlorophenol | 0.044 | U |
| Pentachlorophenol | 0.040 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **85** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258022
**Field ID:** MW-24
**Project Officer:** Pam Marti

**Date Collected:** 06/22/99
**Date Prepared:** 06/25/99
**Date Analyzed:** 07/01/99

**Method:** SW8041
**Matrix:** Water
**Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.050 | U |
| 2,4,5-Trichlorophenol | 0.050 | U |
| 2,3,4,6-Tetrachlorophenol | 0.046 | U |
| 2,3,4,5-Tetrachlorophenol | 0.046 | U |
| Pentachlorophenol | 0.041 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **85** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258023 **Date Collected:** 06/22/99 **Method:** SW8041
**Field ID:** MW-24A **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/01/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.049 | U |
| 2,4,5-Trichlorophenol | 0.049 | U |
| 2,3,4,6-Tetrachlorophenol | 0.045 | U |
| 2,3,4,5-Tetrachlorophenol | 0.045 | U |
| Pentachlorophenol | 0.041 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **69** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258024 **Date Collected:** 06/22/99 **Method:** SW8041
**Field ID:** ACCSW1 **Date Prepared:** 06/25/99 **Matrix:** Water
**Project Officer:** Pam Marti **Date Analyzed:** 07/01/99 **Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.049 | U |
| 2,4,5-Trichlorophenol | 0.049 | U |
| 2,3,4,6-Tetrachlorophenol | 0.045 | U |
| 2,3,4,5-Tetrachlorophenol | 0.045 | U |
| Pentachlorophenol | 0.040 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **89** | **%** |

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# Manchester Environmental Laboratory

## Department of Ecology

## Analysis Report for

## Chlorophenols - TBP Spike

**Project Name:** American Crossarm & Conduit **LIMS Project ID:** 1532-99

**Sample:** 99258025
**Field ID:** ACCSW2
**Project Officer:** Pam Marti

**Date Collected:** 06/22/99
**Date Prepared:** 06/25/99
**Date Analyzed:** 07/01/99

**Method:** SW8041
**Matrix:** Water
**Units:** ug/L

| Analyte | Result | Qualifier |
|---|---|---|
| 2,4,6-Trichlorophenol | 0.049 | U |
| 2,4,5-Trichlorophenol | 0.049 | U |
| 2,3,4,6-Tetrachlorophenol | 0.045 | U |
| 2,3,4,5-Tetrachlorophenol | 0.045 | U |
| Pentachlorophenol | 0.041 | U |

**Surrogate Recoveries**

| | | |
|---|---|---|
| **2,4,6-Tribromophenol** | **93** | **%** |

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# Appendix C

# Analytical Results from 1997 and 1998 at American Crossarm

# Appendix C

## 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 |
|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons** | | | | | | | |
| 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(ghi)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** |
| **Chlorinated Phenolics** | | | | | | | |
| 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.

# Appendix C (cont'd)

## 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 |
|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons**[1] | | | | | | | |
| 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** |
| **Chlorinated Phenolics**[2] | | | | | | | |
| 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** |

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.

[1] = PAH results from samples collected in December 1997.

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

# Appendix C (cont'd)

## 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 |
|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons** | | | | | | | |
| Naphthalene | **0.015** | **0.017** | **0.015** | **0.012** | **0.012** | **0.21** | **0.11** |
| Acenaphthylene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | 0.0065 U | 0.0065 U |
| Acenaphthene | **0.0026 J** | 0.0064 U | **0.0033 J** | 0.0066 U | 0.0066 U | **0.22** | **0.12** |
| Fluorene | **0.0028 J** | 0.0064 U | **0.0033 J** | 0.0066 U | 0.0066 U | **0.13** | **0.096** |
| Phenanthrene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.16** | **0.11** |
| Anthracene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.073** | **0.036** |
| **Sum LPAH** | **0.0204 J** | **0.017** | **0.0216 J** | **0.012** | **0.012** | **0.793** | **0.472** |
| Fluoranthene | 0.0033 U | 0.0032 U | 0.0034 U | 0.0033 U | 0.0033 U | **0.24** | **0.047** |
| Pyrene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.12** | **0.024** |
| Benzo(a)anthracene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.019** | **0.0057 J** |
| Chrysene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.026** | **0.0062 J** |
| Benzo(b)fluoranthene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.02** | **0.0073 J** |
| Benzo(k)fluoranthene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.0066 J** | **0.0037 J** |
| Benzo(a)pyrene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.006 J** | **0.0043 J** |
| 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 |
| 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** | 0.0032 U |
| **Sum HPAH** | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.4523 J** | **0.0982 J** |
| 2-Methylnaphthalene | **0.01** | **0.012** | **0.01** | **0.0098** | **0.01** | **0.089** | **0.031** |
| 1-Methylnaphthalene | **0.0054** | **0.0062** | **0.0054** | **0.0049** | **0.0053** | **0.08** | **0.026** |
| 2-Chloronaphthalene | 0.0066 U | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | 0.0065 U | 0.0065 U |
| Dibenzofuran | 0.0033 U | 0.0032 U | **0.0026 J** | 0.0033 U | 0.0033 U | **0.082** | **0.066** |
| Retene | **0.0034 J** | 0.0064 U | 0.0068 U | 0.0066 U | 0.0066 U | **0.024** | **0.021** |
| **Chlorinated Phenolics** | | | | | | | |
| 2,4,6-Trichlorophenol | 0.024 U | 0.024 U | 0.025 U | 0.024 U | 0.024 U | **0.018 J** | **0.013 J** |
| 2,4,5-Trichlorophenol | 0.024 U | 0.024 U | 0.025 U | 0.024 U | 0.024 U | **0.0065 J** | **0.013 NJ** |
| 2,3,4,6-Tetrachlorophenol | 0.022 U | 0.022 U | 0.023 U | 0.022 U | 0.022 U | **0.093** | **0.068** |
| 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 | 0.021 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.

# Appendix C (cont'd)

## 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 |
|---|---|---|---|---|---|---|
| **Polynuclear Aromatic Hydrocarbons** | | | | | | |
| Naphthalene | **0.02** | **0.015** | **0.014** | **0.027** | **0.044** | **0.24** |
| Acenaphthylene | 0.0062 U | 0.0063 U | 0.0063 U | 0.0062 U | 0.0063 U | 0.0063 U |
| Acenaphthene | 0.0062 U | 0.0063 U | 0.0063 U | 0.0062 U | **0.5** | **0.19** |
| Fluorene | 0.0062 U | 0.0063 U | 0.0063 U | 0.0062 U | **0.044** | **0.15** |
| Phenanthrene | 0.0062 U | 0.0063 U | 0.0063 U | 0.0062 U | **0.018** | **0.096** |
| Anthracene | 0.0062 U | 0.0063 U | 0.0063 U | 0.0062 U | **0.11** | **0.029** |
| **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 |
| **Chlorinated Phenolics** | | | | | | |
| 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.