VOLUME II

OPERATION AND MAINTENANCE REPORT

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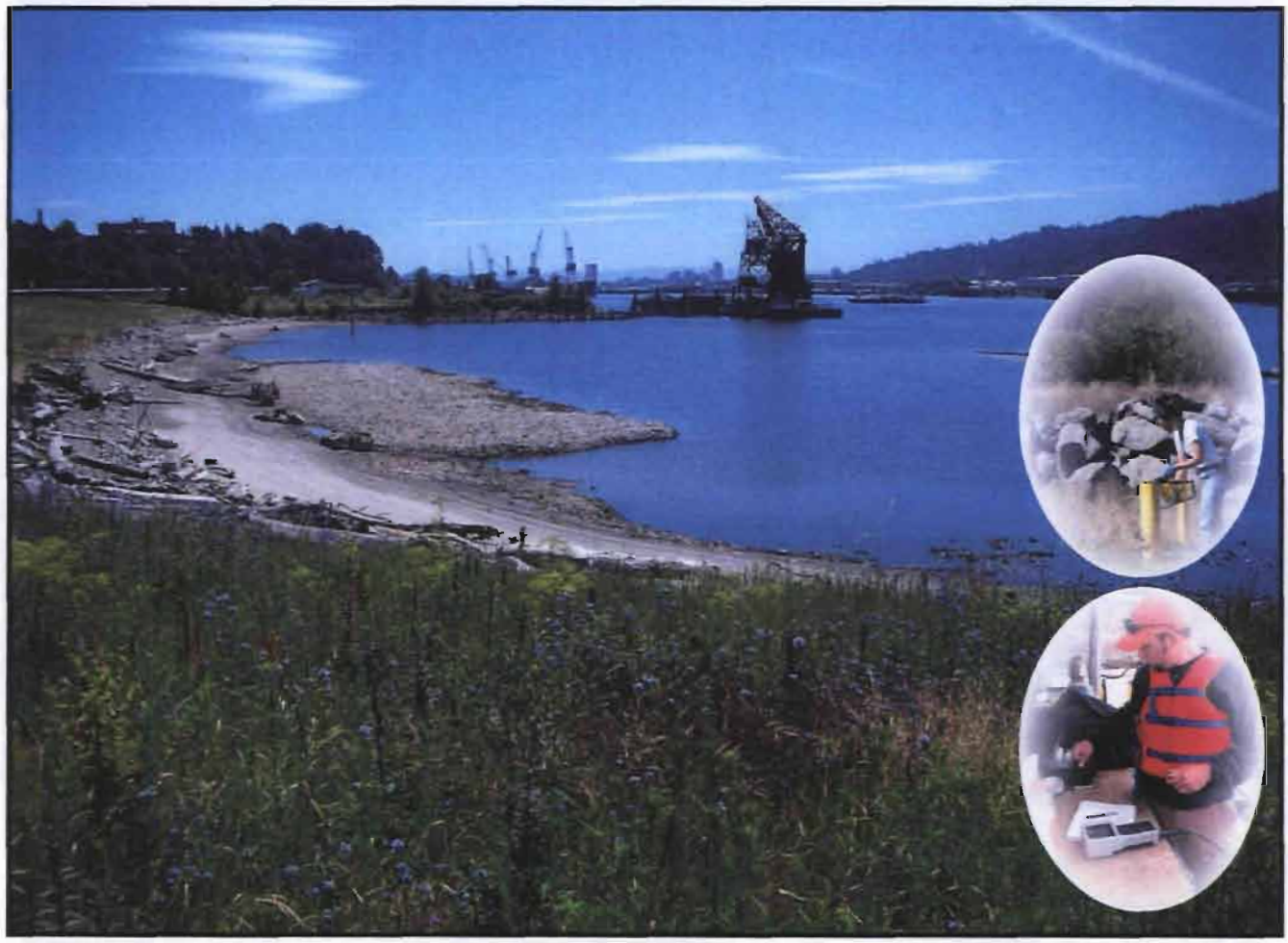
(JANUARY 2007 THROUGH DECEMBER 2007)

MCCORMICK & BAXTER CREOSOTING COMPANY
SUPERFUND SITE

PORTLAND, OREGON



May 2008

Task Order No. 71-03-28

ecology and environment, inc.

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State of Oregon
Department of
Environmental
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Volume 2

Operation and Maintenance Report

(January 2007 through December 2007)

McCormick & Baxter Creosoting Company Site Portland, Oregon

Task Order No. 71-03-28

May 2008

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
Northwest Region
2020 SW Fourth Avenue
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Attachment E

Armoring Assessment and Repair

McCormick & Baxter Creosoting Company Site Portland, Oregon

Task Order No. 71-03-28

May 2008

Prepared for:

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List of Abbreviations and Acronyms

AAC	Advanced American Construction, Inc.
BAA	Biological Assessment Addendum
DEA	David Evans & Associates, Inc.
DEQ	Oregon Department of Environmental Quality
E & E	Ecology and Environment, Inc.
EMR	Environmental Monitoring Report
EMRP	Environmental Monitoring Report Plan
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
GPS	Global Positioning System
McCormick & Baxter	McCormick & Baxter Creosoting Company
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NTU	Nephelometric Turbidity Unit
OC	Organoclay
O&M	Operations and Maintenance
Site	McCormick & Baxter Creosoting Company
USACE	United States Army Corps of Engineers

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1 Introduction and Purpose

Ecology and Environment, Inc. (E & E) under contract with the Oregon Department of Environmental Quality (DEQ), prepared this armoring assessment and repair report for the McCormick & Baxter Creosoting Company (McCormick & Baxter) Portland Plant site located in Portland, Oregon. The site, a former wood-treating facility, is located along the Willamette River at 6900 North Edgewater Street. This report was prepared under Task Order 71-03-28 to document the assessment of the sediment cap integrity, including bathymetric difference image analysis, diver inspections, and repairs of the sediment cap armor that occurred in June and July 2007.

The activities associated with the armoring assessment and repair included the following.

- Evaluation of bathymetric difference images showing changes in underwater surface elevations between the 2004 and 2006 multibeam bathymetric surveys, identification of potential anomalies, and performance inspections of potential anomalies;
- Placement of additional rock armoring in six locations identified during inspections and sampling events in 2006 and 2007; and
- Performance of environmental monitoring at the site during construction activities in June and July of 2007.

This report contains background information regarding previous sediment cap inspections; a discussion of the bathymetric image difference analysis (difference analysis); a description of the sediment cap repair construction activities; and a summary of environmental monitoring results at the site. Also included are photo documentation; the Environmental Monitoring Report Plan (EMRP) prepared prior to starting construction activities; the Environmental Monitoring Report (EMR) submitted to the National Marine Fisheries Service (NMFS) at the completion of construction activities; daily Construction Monitoring Forms documenting construction activities; and Difference Images completed August 2007, as Appendices A through E, respectively.

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2 Background

2.1 Site Background

As specified in the Record of Decision for this site, a sediment cap was selected by DEQ and the United States Environmental Protection Agency (EPA) to prevent humans and aquatic organisms from direct contact with contaminated sediments and to minimize releases of contaminants from the sediment that might result in contamination of the Willamette River in excess of Federal and state ambient water quality criteria. Construction of the sediment cap was implemented in 2004 and primarily consisted of an armored sand cap placed over approximately 23 acres of contaminated sediment. Construction occurred during the summers of 2004 and 2005. Sediment cap construction performed in 2005 followed construction work performed by the City of Portland to stabilize two, high-pressure sewer lines located within a one-acre portion of the sediment cap.

In addition to the sand layer, an oil adsorptive material known as organophyllic clay was placed in two creosote seep areas. To protect the cap from erosion, the sand and organophyllic clay were armored with a combination of rock and articulated concrete blocks. The design of the cap armoring layer was based on evaluation of erosional forces, including hydraulic induced stresses due to river currents associated with a 500-year flood, vessel-induced propeller velocities from a tractor tug and various sized recreational boats, wind waves associated with a 100-mile per hour wind storm, and vessel wakes associated with various boats including a 100-foot fireboat traveling at 14 knots. These forces were evaluated taking into account river level variations due to tidal action and flood currents. Additionally, numerical modeling was used to analyze wave transformation between deep water and the shoreline.

In 2005, four organoclay (OC) mats were installed at the site. The OC mats were placed at locations where ebullition, in conjunction with tidal pumping, created minute pathways of movement for otherwise non-mobile (residual) creosote. Three of the four mats are located in the embayment area, and one of the mats is located beneath the Burlington Northern Railroad bridge.

A detailed discussion of sediment cap construction activities is provided in the documents titled *Remedial Action Construction Summary Report Sediment Cap*

(June 2004 through November 2004) (E & E 2006a) and *Remedial Action Construction Summary Report Sediment Cap Completion (August 2005 through October 2005)* (E & E 2006b), both issued by E & E in May 2006.

Since 2005, two additional organoclay mats have also been placed at the site. One mat was installed in 2006; details of the installation are provided in the document titled *Organoclay Cap Performance Evaluation – Field Study* included as Attachment E of the *Operations and Maintenance Report (October 2005 through December 2006)* issued by E & E in March 2007 (E & E 2007). The second mat was installed in October 2007, after the armor repair discussed in this report. The mat installed in October 2007 was put in place to intercept potential NAPL releases at one location where a sheen from a gas bubble was observed along the river bank. Off-gasses formed beneath the river (due to natural biological processes and the degradation of wood debris and potentially contaminants) tend to migrate via ebullition through preferential pathways. These 'bubble pathways' have been frequently observed at the site; typically no oily sheen is observed in connection with these bubble pathways, but in one instance a sheen was observed, prompting the placement of the mat. Details of the installation are provided in the document titled *Site Observations and Activity Summary,* included as Attachment B of this O&M Report. The location of all organoclay mats can be seen on the updated record drawings included in this report as Attachment I.

2.2 Sediment Cap Inspection Background

The findings from inspections and surveys conducted prior to December 2005, as well as cap completion details, are documented in reports E & E submitted to DEQ in May 2006 (E & E 2006a, 2006b, 2006c, and 2006d). David Evans and Associates, Inc. (DEA) performed a series of side-scan sonar and multibeam bathymetric surveys of the Willamette River bottom within the sediment cap boundary to help E & E identify potential anomalies within the sediment cap. The findings of the 2004 and 2005 surveys (DEA 2005) were used to guide cap repairs conducted in 2005 and to help complete the Sediment Cap Construction Record Drawings, which are included as Appendix B of the Sediment Cap Completion Construction Summary Report (E & E 2006b).

Bathymetric and side scan sonar images developed from June 2004 through December 2006 are provided in the document *Sediment Cap Armoring Integrity Assessment* included as Attachment C of the 2006 O&M Report (E & E 2007). The findings of the bathymetric and side scan sonar surveys performed in April 2006 were compared to previous surveys to identify remaining anomalies with sediment cap armoring and to guide diver inspections conducted in September 2006.

In addition to the sonar and bathymetric surveys, E & E performed the following activities to evaluate the integrity of the sediment cap's armoring:

- Monthly or weekly visual beach inspections of armoring from the shoreline during 2006 and 2007 (i.e., beach inspections);
- Diver inspections of submerged armoring in 2006 and 2007; and
- Physical probing of rock armor in 2006.

Visual inspections from the shoreline were performed on a weekly basis August 2006 through October 2006 and on a monthly basis January 2006 through July 2006 and November 2006 up to armor repair activities in June/July 2007. No signs of damage to the sediment cap armor or deficiencies in the armor addressed in this report were observed from the shore.

Based on the differencing image showing changes in underwater surface elevations between the November 2005 and April 2006 multibeam bathymetric survey events, potential anomalies were identified where shoaling or deepening had occurred. Six areas were identified where it appeared there may have been deposition or scouring of the riverbed surface. A seventh area was identified where pilings and/or logs appeared to be present.

E & E contracted with Advanced American Construction, Inc. (AAC) to conduct diver inspections in September 2006 to investigate the armor layer of the cap at the six potential anomalies identified from the imagery and along transects across the sewer pipeline area, as well as to remove the pilings and/or logs in a seventh area. Divers manually inspected targeted locations to determine the thickness of the outer armor layer, to visually evaluate the armor coverage, and to determine whether corrective action was necessary to maintain the integrity of the sediment cap. Following diver inspections, three areas were identified as being deficient in rock armoring. The locations are Areas 1, 2, and 3, indicated on Figure 2-1. AAC subcontracted DEA to supply a field hydrographer equipped with GPS to provide location data during the diver inspections to guide the inspections as well as to document the observation points and any anomalies identified in the course of the inspection

E & E also inspected armor integrity in the course of diver-assisted surface water sampling in October 2006 and March 2007. Inspections conducted in October 2006 revealed the absence of rock armoring in one of the sample locations (Location 5) in the shallow embayment riverward of the former Tank Farm Area. E & E subsequently conducted physical probing of the armor in this portion of the embayment on December 6, 2006, to estimate the extent of the exposed sand cap. The extent is indicated as Area 6 on Figure 2-1. Inspections conducted in March 2007 revealed the absence of rock armoring at two locations near one of the sample locations (Location 10). The locations are Areas 4 and 5, indicated on Figure 2-1.

A detailed discussion of the difference images, diver inspections, and embayment probing performed in 2006 is provided in Attachment C of the 2006 O&M Report (E & E 2007).

3 Bathymetric Difference Analysis

Multibeam bathymetric surveys were conducted in June 2004, November 2004, November 2005, and April 2006. Previous difference image analysis showing changes in underwater surface elevations were completed for June 2004 versus November 2004 and November 2005 versus April 2006. In June 2007, E & E contracted with DEA for the preparation of additional difference analysis for the previously performed multibeam bathymetric surveys. These figures are included in Appendix E. Sheets 1 through 6 of Appendix E show the difference analysis for the following dates:

- June 2004 verses November 2004,
- June 2004 verses November 2005,
- November 2004 verses November 2005,
- June 2004 versus April 2006,
- November 2004 verses April 2006, and
- November 2005 verses April 2006.

The additional images were prepared to more easily identify trends not readily visible when only compared to the previous survey event.

Each difference analysis was reviewed by E & E and DEQ. In general, difference images showed expected shoaling (thickening) were cap material was placed and indicates that the extent of the cap conforms with the design plans for the cap. Sheet 1 of the differencing images correctly indicates an area of no change near the sewer line area, which was not capped as of November 2004. Sheet 2 of the difference analysis correctly indicates shoaling following the sediment cap completion work, which capped the sewer line area and included additional capping material under the Burlington Northern railroad bridge. The sediment cap completion work can also be seen as shoaling on subsequent sheets comparing pre- and post-sediment cap completion surveys. Also, in general, the cap appears to be stable, with no visible trends of deepening or shoaling that would indicate the cap itself is being affected by erosional forces.

Following review, however, three potential anomalies were identified. The anomalies can be seen initially on Sheet 1 as deepening and continue to be present on Sheets 2 and 4. Figure 3-1 highlights the three areas of concern. Based on the results of the difference analysis, additional sediment cap diver inspections were

performed in July 2007, during the armor repair. Results of the diver inspections are discussed in Section 4.3.2.

4 Construction Activities

To address the deficiencies in the rock armor overlying the sediment cap, additional armoring material was placed at selected locations.

4.1 Contracting and Subcontracting

Under contract with DEQ, E & E prepared a Scope of Work contract documents and specifications, and the EMRP for the armor repair. E & E also sub-contracted the marine construction contractor, provided field oversight, and prepared the post-construction EMR. A sole-source subcontract was awarded to AAC based on their reasonable prices, familiarity with the site, previous sources of rock armor, and previous armor placement experience at the site.

Under subcontract with E & E, AAC placed additional rock armoring at six locations, provided diver inspections and environmental protection, and assisted with turbidity monitoring. AAC also provided project management of the material/equipment vendors that were required to complete armor repairs. Morse Bros., Inc. supplied the 6 and 10-inch minus rock for the armor repair.

4.2 Pre-Construction Activities

4.2.1 Inspections

Previous sediment cap inspections are described in Section 2.2. During inspections conducted in 2006 and 2007, six areas were identified as being deficient in rock armoring, and three areas were identified as needing additional diver inspections based on difference analysis.

4.2.2 Pre-Construction Meetings

E & E, DEQ, and AAC attended a site meeting on May 9, 2007, to discuss site conditions, environmental monitoring during construction, and rock placement techniques. Attendees included John Montgomery and Eric White with E & E, Kevin Parrett with DEQ, and Mike Johns and Jake Duyck with AAC.

4.2.3 Regulatory Compliance

Substantive compliance with regulations prescribed under the Endangered Species Act (ESA) was required due to the potential for sediment cap construction activities to impact Federally listed salmon species (e.g., chinook salmon) in the Willamette River. In 2004, The United States Army Corps of Engineers (USACE),

with assistance from E & E, developed a biological assessment addendum (BAA) to update the biological assessment that had been submitted for barrier wall work (EPA 2003a). Submitted on behalf of the EPA, the BAA triggered the issuance by NOAA Fisheries of an updated biological opinion (NOAA Fisheries 2004). Two additional BAAs were submitted after the contractor's construction methods were known. The first one (E & E 2004a) discussed the importation of topsoil for the 2005 upland cap, and the second (E & E 2004b) addressed towing pilings to the shore, operating equipment in shallow water, and grouting underwater articulated concrete block seams. In May 2006, the EPA, with assistance from DEQ, developed a BAA to update the biological assessment to cover activities for the Operation and Maintenance of the Soil Cap, Sediment Cap, and Groundwater Remedy (EPA 2006). The BAA again triggered the issuance by NMFS of an updated biological opinion in October 2006 (NMFS 2006). The biological opinion determined that the Operations and Maintenance of site remedies was not likely to jeopardize ESA species but mandated that reasonable and prudent measures be taken during construction.

E & E developed an EMRP to be used by field oversight personnel to implement conservation measures prescribed in the 2006 biological opinion. The EMRP is included as Appendix B of this report. Please refer to Section 5 for additional details associated with the development and implementation of this plan.

In preparation for sediment cap construction in 2004, the USACE prepared the Clean Water Act Section 401 substantive regulatory determination (EPA 2003b) for signature by the EPA. The 401 determination described measures to be taken during construction to mitigate impacts to water quality and provided the procedures to follow for notification and record keeping with respect to water quality issues. Because the AAC's work was a continuation of the originally planned sediment cap construction, the 2004 Clean Water Act Section 401 substantive determination was carried over to armor repair in 2006.

The timeframe for in-water work at the site is limited by the biological opinion to July 1 through October 31. However, DEQ requested that the work window be expanded to allow work to begin June 25, 2007, to take advantage of higher water levels to allow better access to place rock in the embayment. This request was approved by NOAA Fisheries on June 12, 2007.

4.3 Construction Activities

Construction activities during the armor assessment and repair consisted of the following components:

- General Mobilization and Preparation;
- Diver Inspections and Verification;
- Additional Rock Placement in Areas 1 through 5; and

- Additional Rock Placement Area 6.

Equipment used during site activities include a Manitowoc Vicon 4100W crane mounted on a barge, material barge, tug boat, diving support boat, two skiffs, a CAT 308C excavator, a CAT 930G loader, a crew boat, and small material placement barge. The crane barge was equipped with Hypack software and GPS to provide location data.

4.3.1 General Mobilization and Preparation

AAC mobilized all their equipment, except for the small material placement barge, to the site on June 26, 2007. The small material placement barge was mobilized to the site at the end of day on June 27, 2007. All work was performed with water-based equipment, and no mobilization occurred at the site on land.

4.3.2 Diver Inspections and Verification

AAC utilized divers to delineate the boundary of each deficient area, verify the location and thickness of the placed rock, and inspect anomalies identified during differencing imaging analysis.

Prior to placing rock at Areas 1 through 5 (Figure 2-1), AAC used GPS coordinates provided by E & E to locate each repair area. The GPS was located at the end of the crane boom, which corresponded spatially to the clam shell bucket. Therefore, the clam shell bucket was used to locate each area. Once the area was generally located, divers entered the water and delineated the deficient areas using buoys. This assisted in accurate material placement, as well as verifying the GPS coordinates, for the deficient area. Area 6 had previously been delineated during probing activities on December 6, 2006; and therefore, did not require locating using GPS. At the location, six divers entered the water and visually inspected and probed to further delineate the area and to place buoys at more frequent intervals than had been placed in 2006.

After AAC placed the rock armoring, as described in Section 4.3.3 for Areas 1 through 5, divers again entered the water and performed inspections of the placed rock to verify placement and thickness. If an area was found to still be deficient, the divers instructed the crane operator where to place additional material. E & E viewed a live video feed on the dive boat while the divers were performing verifications to ensure areas of concern were addressed. In Areas 1 through 5, only Area 1 required additional material to be placed. (Diver verification found an area of approximately 6'x6' along the northern edge that remained deficient after initial rock placement.) Following additional rock placement, diver inspections showed sufficient coverage. Rock placement at Area 6 took several days; therefore, diver verification did not take place until one day of rock placement remained. Diver verification of Area 6 indicated that a crescent-shaped portion of the northern end required additional material placement. The remaining material

was placed in the area delineated by the divers, after which no subsequent diver inspections occurred.

As time allowed, three additional areas were inspected as indicated on Figure 3-1. The areas were identified during the June 2007 differencing image analysis. No additional rock was placed at any of the locations. Diver inspections of Areas 8 and 9 indicated that sufficient rock armoring exists. Because the deepening occurred between June 2004 and November 2004 and does not appear to be worsening, it is possible it was a result of initial consolidation of the underlying sediments during and directly following sediment cap construction. During diver inspections of Area 7, a thick layer of sand was present with no visible armoring; however, this sand appeared to have accumulated on the ledge of the cap armor surface and is believed to be underlain with rock armor. Because the deepening does not appear to be worsening, it is also likely that initial consolidation of the underlying sediments during and directly following sediment cap construction caused the anomaly. Figure 3-1 also depicts a scour hole near the bridge pier that was filled during sediment cap construction. E & E recommends that these areas continue to be monitored in the future.

4.3.3 Rock Placement Areas 1 through 5

Approximately 139 tons of 6-inch minus rock was placed at five locations (Areas 1 through 5), covering a total area of approximately 200 square yards, where rock armoring was found to be deficient. Work began on June 26, 2007 and ended June 27, 2007.

Following diver delineation in Areas 1 through 5, an oil absorbent boom was placed around the work area, and the material was placed using a clam shell bucket and the Manitowoc crane. The material barge was secured to the side of the crane barge and moved as one unit. Material was picked up directly off the material barge using the clam shell. Rock was released from the bucket at or near the water surface and allowed to drop through the water column into the target location.

At Areas 4 and 5, each time a bucket of material was placed the GPS and Hypack software recorded the bucket location. However, at Areas 1 through 3, each bucket location was not able to be marked because of software difficulties. The GPS remained viable and was able to guide the crane operator to the placement location. In addition, diver delineation and verifications confirmed sufficient coverage was achieved without being able to track the load distribution on screen.

For Areas 1, 4, and 5, the crane and material barge were secured outside the sediment cap using spuds; the crane had a long enough reach to access those locations from outside the sediment cap. For Areas 2 and 3, the material and crane barge had to be put into placement position using a tug boat and crew boat--this is referred to as "live boating." These two Areas were located too far within the sedi-

ment cap boundary to be accessed from a barge stationed outside the cap boundary. AAC downloaded the sediment cap coordinates provided by E & E directly into the Hypack software program to assist in navigation and ensure that no spuds were extended into the sediment cap.

4.3.4 Rock Placement Area 6

Approximately 752 tons of 10-inch minus rock was placed in the embayment (Area 6), covering a total area of approximately 800 square yards, where rock armoring was found to be deficient. Work in the embayment began on June 28, 2007, and ended July 11, 2007.

Prior to beginning work in the embayment area, an oil absorbent boom was placed around the work area. During work hours, one end of the boom remained open to allow boat access to the area. Because the crane barge was unable to gain access to the embayment, rock was loaded onto a smaller barge that could be guided to the work area using a crew boat and small skiffs. Rock was placed from the material barge into a box using a loader. The crane was then used to move the box to the smaller barge and dump the material on the small barge. Rock was unloaded from the small barge to the target area using an excavator. Rock was either released from the excavator bucket and allowed to fall through the water column, or was pushed off the end of the barge using the excavator blade. Throughout placement of material, AAC used a skiff and probe to determine extent of coverage and check for deficient spots.

Placing additional rock armoring at Area 6 had several complicating factors. As mentioned above, the low water levels of June and July limited the type of boat that could enter the work area to one having a draft of no more than three feet. The crane barge could not unload directly to this area, as it was beyond the boom reach. AAC successfully used a smaller barge guided into position using skiffs. However, this was a slower process and not as accurate for material placement as the clam shell. Work could only be performed during high tide, otherwise the barge would become grounded on a shoal that ran perpendicular to the site shoreline in the embayment. Rock placement in the embayment was scheduled around the daytime high tide from June 28, 2007, to July 9, 2007. On July 9, 2007, the daytime high tide was not high enough to provide the draft necessary to get the small barge into the embayment. E & E, DEQ, and AAC made the decision to begin placing material during the evening high tide to take advantage of the much higher water levels. Night work occurred approximately from 11 p.m. to 5 a.m. During the late night hours of July 9, 2007, and early morning hours of July 10, 2007, the remaining rock armoring was placed.

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5 Environmental Monitoring

Prior to construction, E & E prepared an EMRP, which outlined the monitoring, documentation, and reporting procedures to be followed by oversight personnel. This monitoring was intended to evaluate impacts to water quality and make certain that the protective measures presented in the NMFS biological opinion were implemented.

E & E utilized a full-time, on-site environmental monitor. When construction activities were performed, monitoring included daily shoreline walks and daily turbidity monitoring (during in-water work). The contractor's work procedures were monitored during all construction activities.

The environmental monitor and/or the oversight supervisor performed a daily shoreline walk. During the daily shoreline walk, the environmental monitor/oversight supervisor would document the occurrence of all sick, dead or injured fish and animals and any sheen observed in the river in the daily environmental monitoring report forms. No dead or injured endangered species were observed.

One day prior to AAC beginning construction activities, a large sheen was observed along the river bank at the site and was again observed the morning construction activities were to begin. Because sheen was observed at the site prior to construction activities, E & E inspected the site before and after construction activities each day to differentiate between construction-related sheen and other site sheen. Although sheen was continuously observed along the shore at the site during construction activities, none of the sheen appeared to have resulted from the activities. Sheen observations are described in Attachment B of this report. During construction activities, E & E observed AAC driving and pulling spuds on the crane barge to ensure no sheen was released. As noted previously, spudding and anchoring took place only outside of the cap footprint. E & E also carefully monitored rock placement for any sign of a release of sheen at the placement location. No sheen was observed in the work areas.

E & E developed the water quality monitoring plan, included in the EMRP, which set forth measures to reduce turbidity during construction. The on-site environmental oversight engineer used this plan to assist with monitoring of the contractor's turbidity-minimizing procedures and construction techniques. Turbidity measurements were taken to monitor the construction activities. If turbidity readings had exceeded the turbidity criteria or improper construction techniques had been observed, proper notification and actions would have been taken. The water

quality management plan was available on the McCormick & Baxter site for inspection upon request by EPA or NOAA Fisheries.

Turbidity was monitored during all in-water construction activity. A turbidity background level was established prior to the start of construction activities by measuring turbidity near the shore at two locations: one approximately 100 feet upstream of the upstream edge of the planned work area and one approximately 100 feet downstream of the downstream edge of the planned work area. During in-water work activities, turbidity was monitored within the work area as well as at compliance points located approximately 100 feet upstream and 100 feet downstream from the work area. Water samples/readings were collected/taken at the bottom, mid-level, and top of the water column but not closer than within 5-foot intervals. The turbidity meter took six readings for each depth and averaged the readings for a more accurate measurement.

Turbidity measurements were taken and recorded at least once every four hours during in-water work. The first sample was taken approximately four hours after the initiation of in-water work and once at each four-hour interval thereafter. No turbidity reading exceeded the Water Quality Certifications during construction activities. Background turbidity was established to be 4.35 NTU, so the action level was set at 9.35 NTU (5 greater than background). The maximum turbidity observed at the compliance point was 7.84 NTU.

Visual monitoring of turbidity levels occurred at least once every four hours (two-hour lag time from turbidity readings) during in-water work. Visual observations were recorded on the daily environmental monitoring form. No visual observations of turbidity at levels approaching the turbidity action level were observed.

As prescribed in the biological opinion, the turbidity meter was calibrated before and after each monitoring event. The results of calibration were recorded in the Daily Turbidity Report. Daily turbidity measurements, including information identifying all sampling locations and times and calibration information were faxed to NMFS.

Results of all monitoring activities are presented in the *Environmental Monitoring Report Placement of Additional Rock Armoring (June/July 2007)* attached as Appendix C to this report and submitted to NMFS on August 9, 2007. The report includes photo documentation, copies of the daily environmental monitoring forms, and daily turbidity reports.

In summary, no dead or injured endangered species and no sheen in the work area were observed during environmental monitoring. Turbidity monitoring showed no adverse effects resulting from construction activities.

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Figures

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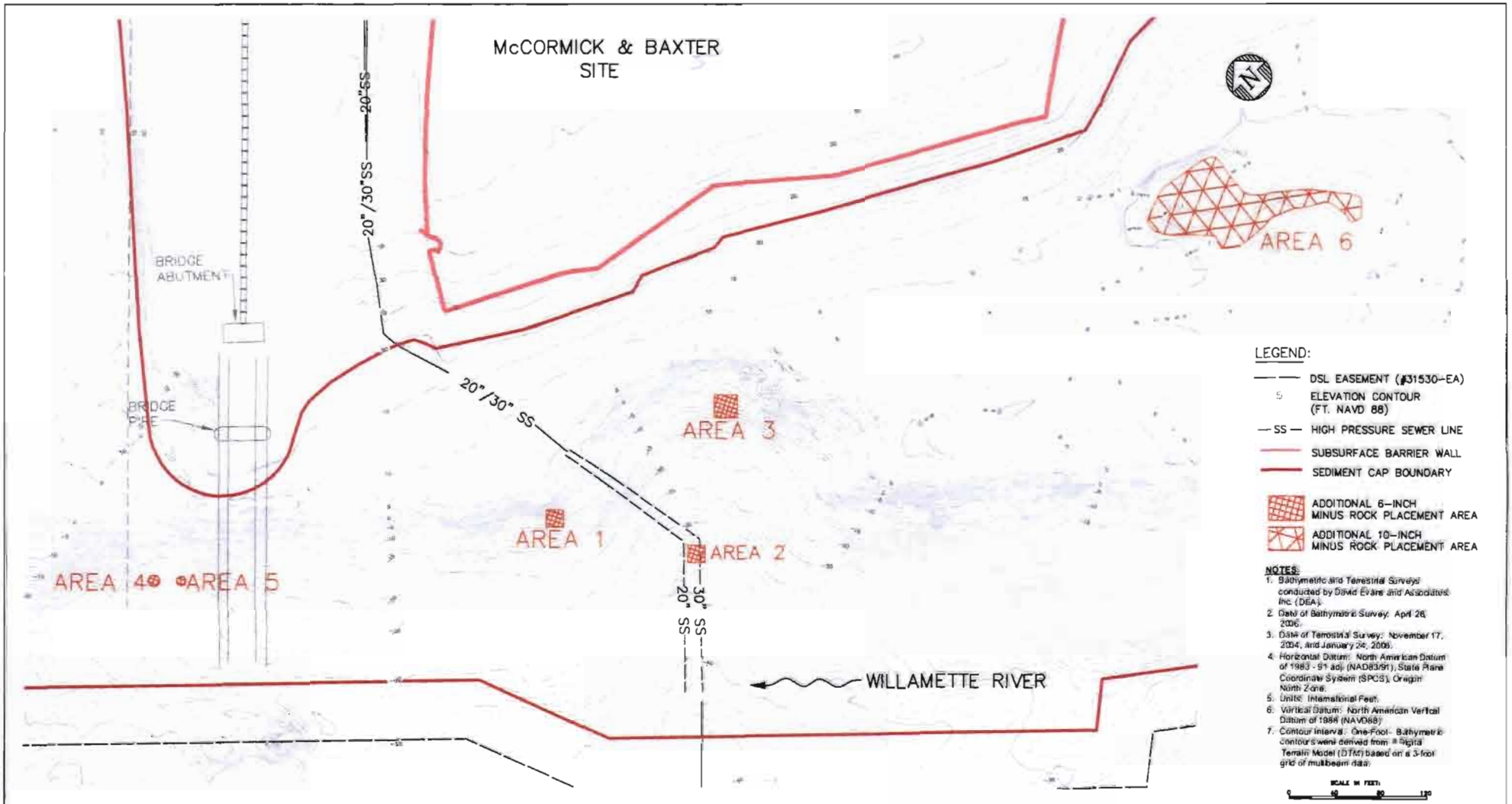


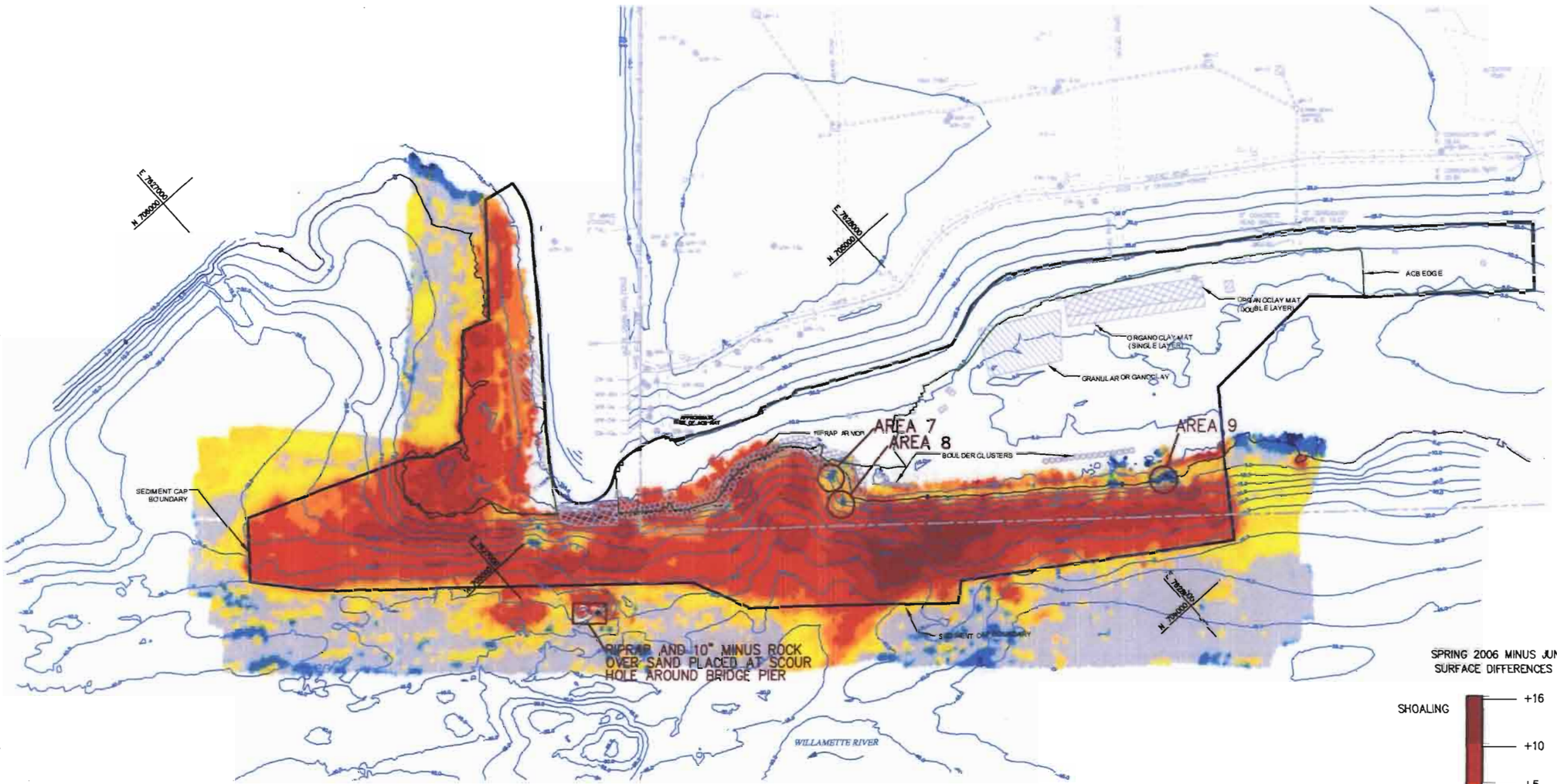
ecology and environment inc.

DRAWN BY A. WHITMAN	CHECKED BY C. NANCARROW
DRAWN BY Z. LEHN	APPROVED BY –

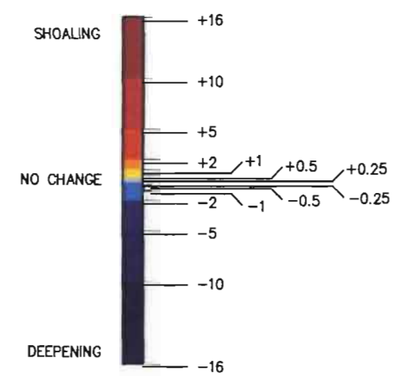
FIGURE 2-1
ARMOR REPAIR AREAS

MCCORMICK AND BAXTER SUPERFUND SITE
WILLAMETTE RIVER, PORTLAND, OREGON

SCALE	DATE DRAWN	DWG FILE NO. M:\ARB\BASEMAP\ Basemap_Rev_Chk 3D 2008.dwg Armor Repair_Fig 2-1 Layout	REV
As Noted	11-13-07		



SPRING 2006 MINUS JUNE 2004
SURFACE DIFFERENCES (FEET)



NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: June 1st and 11th, 2004 vs. April 26th, 2006.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
6. Contour Interval: 5 feet.
   Contours represent a composite surface from November, 2004; January, 2005; and December 2006 upland surveys and April, 2006 in-water survey.
7. The analysis was generated from a 3-foot difference grid of the multibeam bathymetry. The 3-foot grid values of the June 1st and 11th, 2004 survey were subtracted from the April 26th, 2006 survey to produce the difference grid.
8. Water surface elevations were obtained from a Real-Time Kinematic Global Positioning System (RTK GPS). An RTK GPS base station was deployed to provide real-time GPS corrections. RTK corrections were applied to the shipboard GPS for logging of water surface elevations at one-second intervals. A 30-second average of RTK GPS observations was used for correcting multibeam soundings to NAVD88 elevations.
9. Horizontal positions were acquired with an Applanix POS/MV, combined inertial and Real Time Kinematic Global Positioning System (RTKGPS).
10. Depths were acquired with a Reson Seabat 8101 multibeam bathymetric sonar integrated with an Applanix POS/MV positioning and motion reference system.

DWG NO.	DATE	DESCRIPTION	NO.	DATE	DWN	APP'D	DESCRIPTION
–	–	–	–	–	–	–	–

REFERENCE DRAWINGS — REVISIONS

ecology and environment inc.

DESIGNED BY	CHECKED BY
A. WHITMAN	C. NANCARROW
DRAWN BY	APPROVED BY
Z. LEHN	–

FIGURE 3-1
POTENTIAL ANOMALIES - DIVER INSPECTION AREA

MCCORMICK AND BAXTER SUPERFUND SITE
WILLAMETTE RIVER, PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	REV.
As Noted	11-13-07	04_diff_Spring06_June04_11-07-07.dwg	

CAD ON SEAVAS(Engineering Documents\McCORMICK & BAXTER\MB Sediment Cap Surveys 2004-2007\DEA_Diff Surveys_06-06-2007

A

Photo Documentation

McCormick & Baxter Creosoting Company Site
Portland, Oregon

Photographed by: Lenna Cope

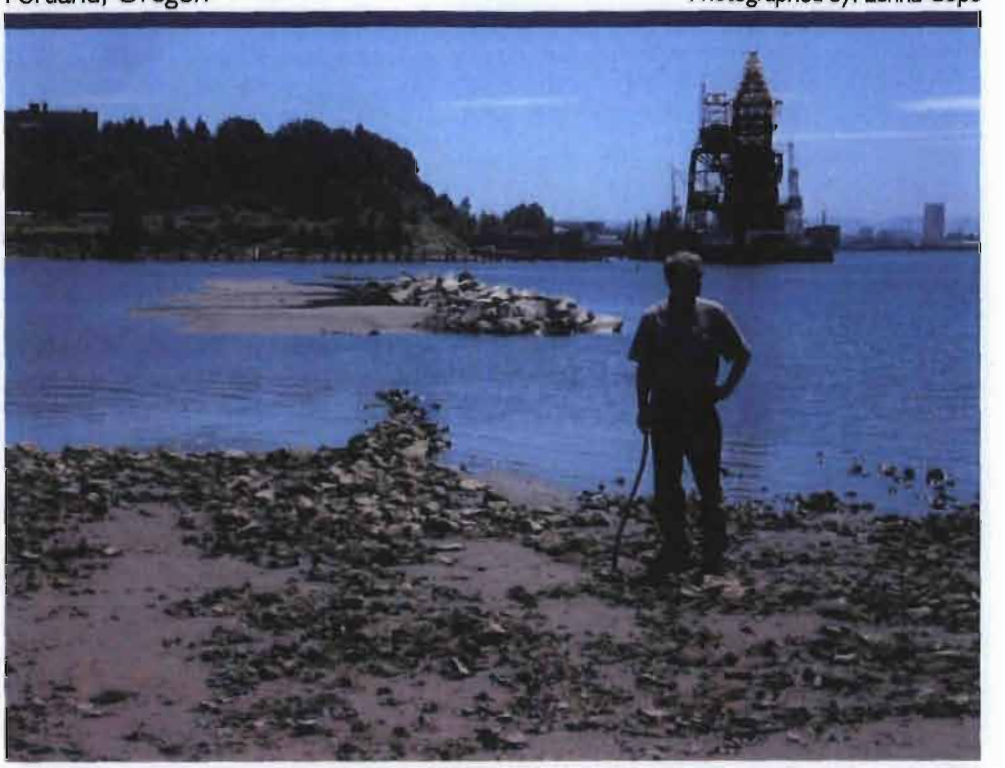


Photo 1 Rock reef located off shore of the site which creates embayment.

Direction: South *Date: 6/26/2007* *Time: 12:13*

Photo 2 6-inch minus rock to be placed at locations 1 through 5.

Direction: South *Date: 6/27/2007* *Time: 8:55*

Photographed by: Lenna Cope

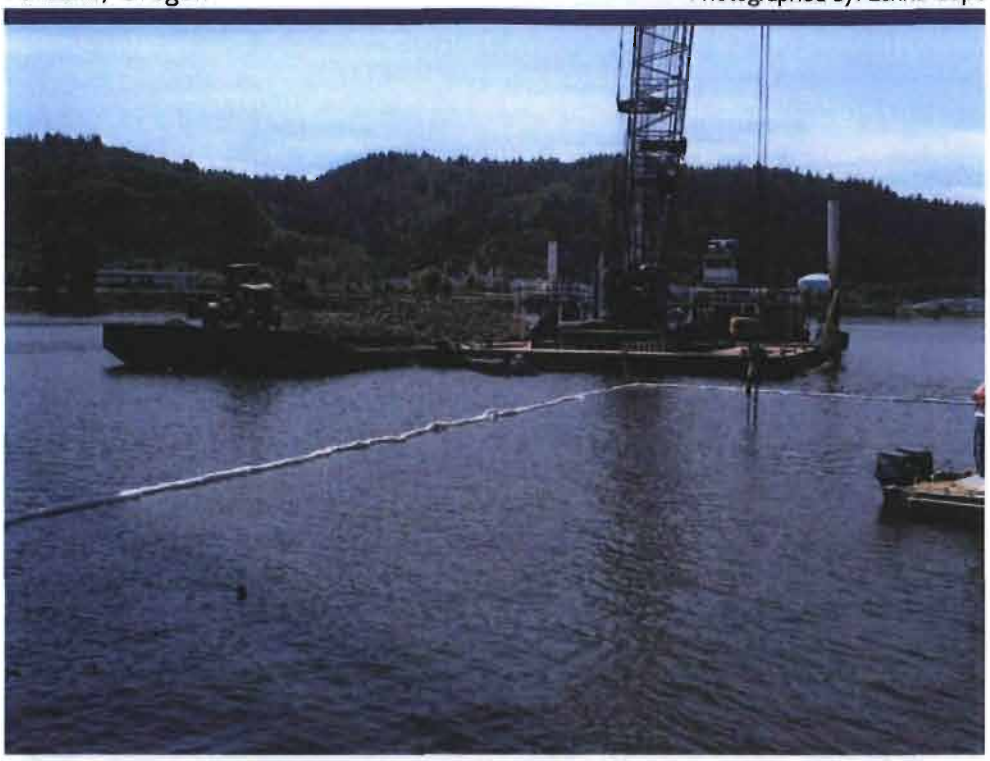


Photo 3 Boom placement around locations 4 and 5.

Direction: Northwest *Date: 6/26/2007* *Time: 14:31*

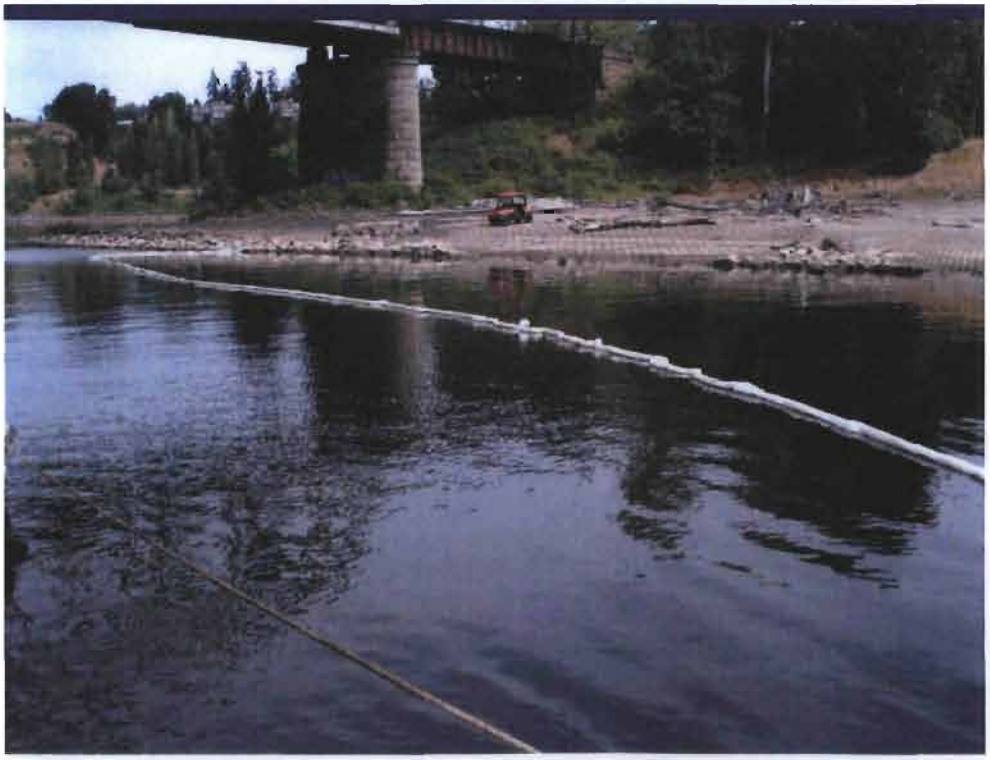


Photo 4 Boom placement around locations 1, 2, and 3.

Direction: North *Date: 6/27/2007* *Time: 10:45*

McCormick & Baxter Creosoting Company Site
Portland, Oregon

Photographed by: Lenna Cope

Photo 5 Placement of 6-inch minus rock at location 5.

Direction: Northwest *Date: 6/26/2007* *Time: 15:26*

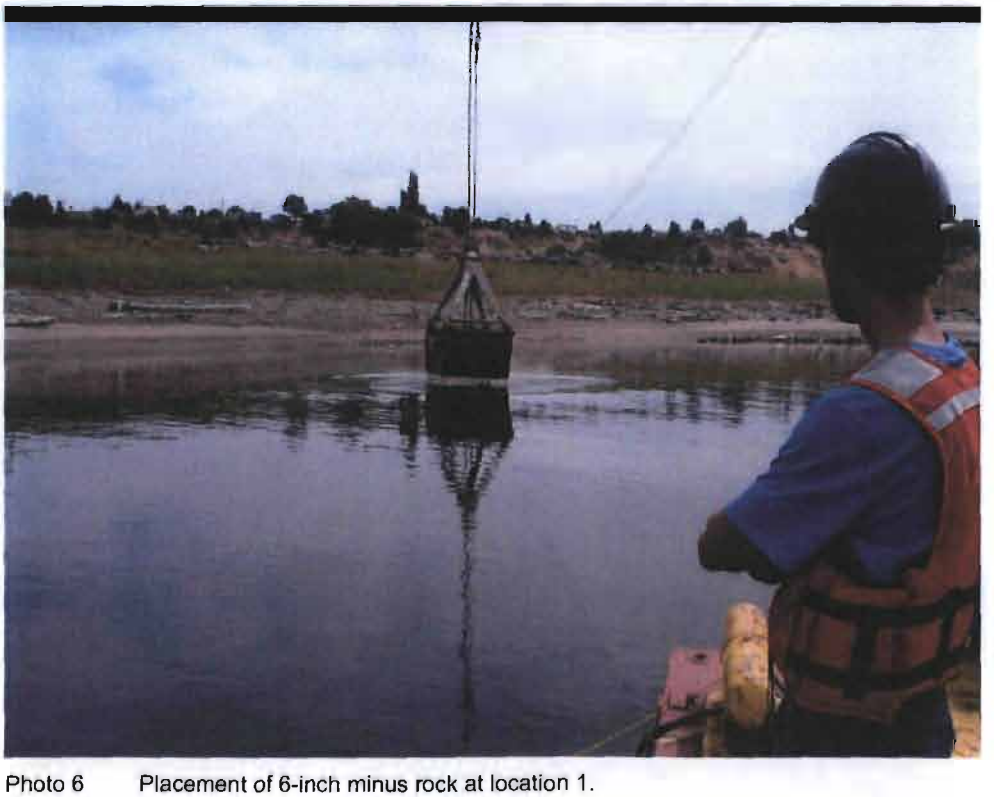


Photo 6 Placement of 6-inch minus rock at location 1.

Direction: East *Date: 6/27/2007* *Time: 10:44*

Photographed by: Lenna Cope

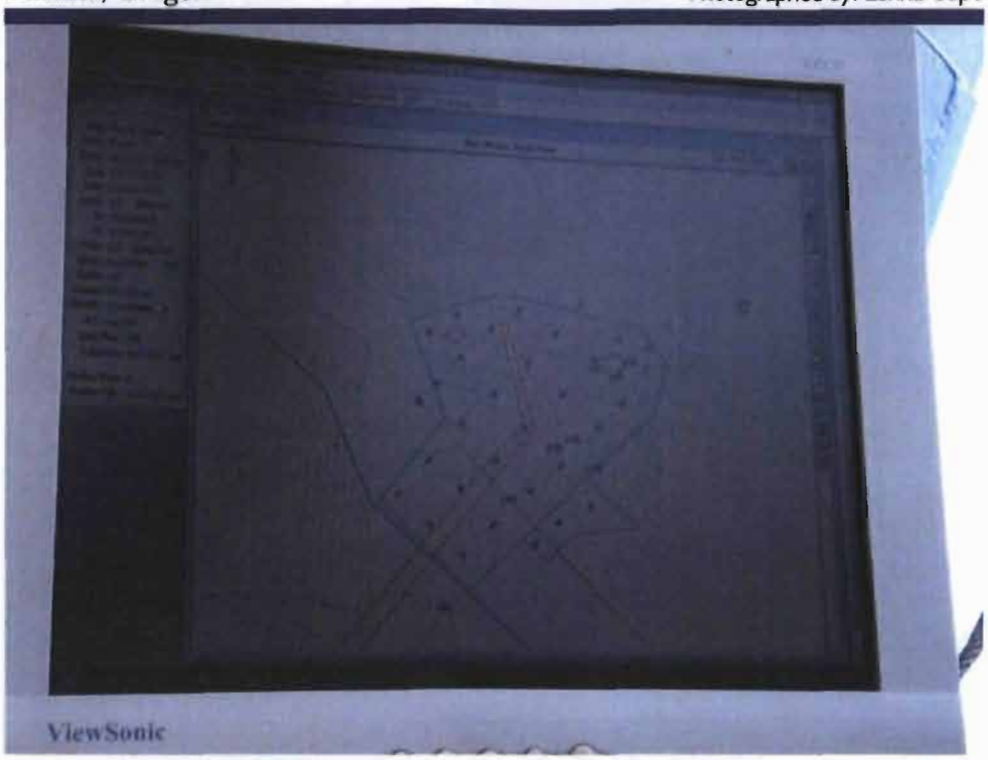


Photo 7 Image of Hypac screen used to guide GPS equipped crane.

Direction: *Date: 6/27/2007* *Time: 9:10*

Photo 8 10-inch minus rock to be placed in embayment (area 6).

Direction: South *Date: 6/27/2007* *Time: 8:56*

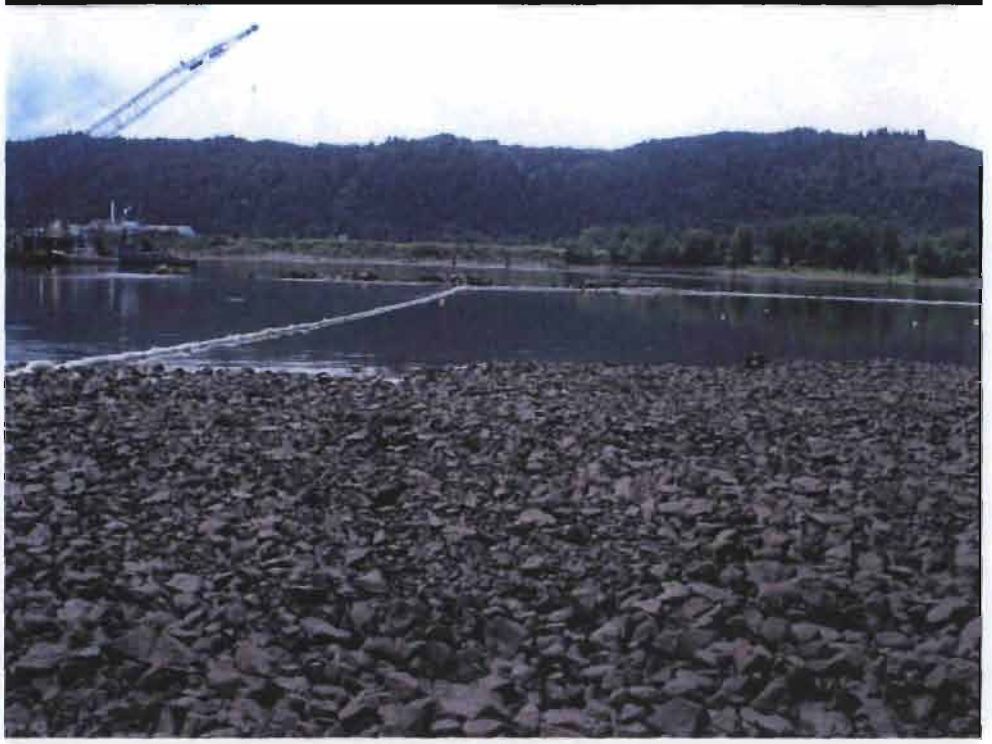


Photo 9 Boom placement around embayment (area 6).

Direction: West *Date: 6/28/2007* *Time: 13:19*

Photo 10 Loading 10-inch minus rock from material barge onto placement barge.

Direction: Southwest *Date: 6/28/2007* *Time: 11:08*

Photographed by: Lenna Cope

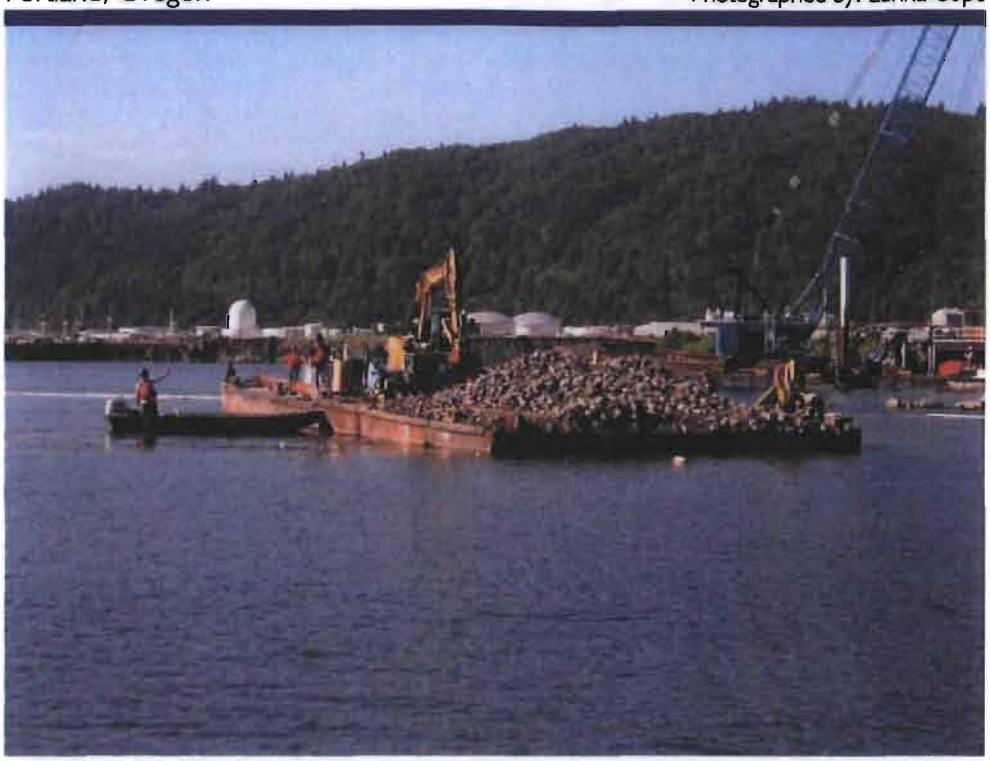


Photo 11 Maneuvering placement barge into embayment (area 6).

Direction: South *Date: 7/6/2007* *Time: 8:52*

Photo 12 Placement of 10-inch minus rock in embayment (area 6).

Direction: South *Date: 7/3/2007* *Time: 9:03*

Photographed by: Lenna Cope

Photo 13 Placement of 10-inch minus rock in embayment (area 6).

Direction: South *Date: 6/28/2007* *Time: 11:59*

Photo 14 Probing embayment to determine extent of rock armor coverage.

Direction: South *Date: 7/6/2007* *Time: 10:08*

Photographed by: Lenna Cope

Photo 15 Location of material and crane barge secured outside the sediment cap.

Direction: Southwest *Date: 6/28/2007* *Time: 11:04*

Photo 16 Geese along shoreline.

Direction: North *Date: 6/27/2007* *Time: 15:00*

McCormick & Baxter Creosoting Company Site
Portland, Oregon

Photographed by: Lenna Cope

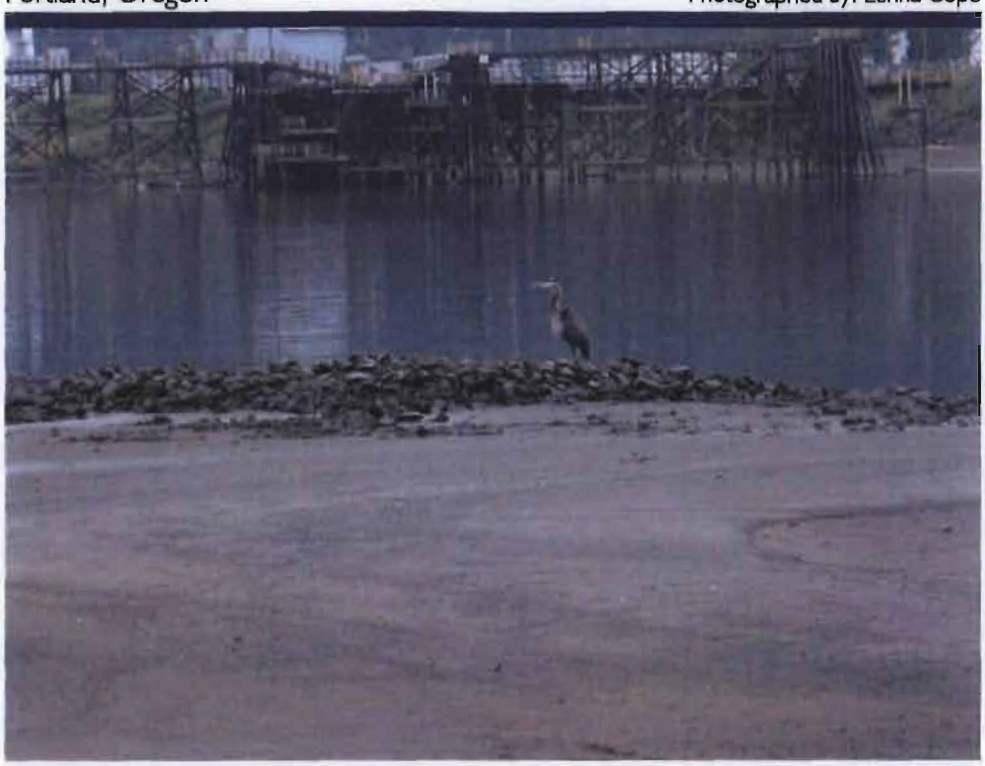


Photo 17 Heron along shoreline.

Direction: West	*Date: 6/28/2007*	*Time: 11:05*

Photo 18 Sheen observed at south end of site.

Direction: West	*Date: 6/26/2007*	*Time: 10:38*

Photographed by: Lenna Cope

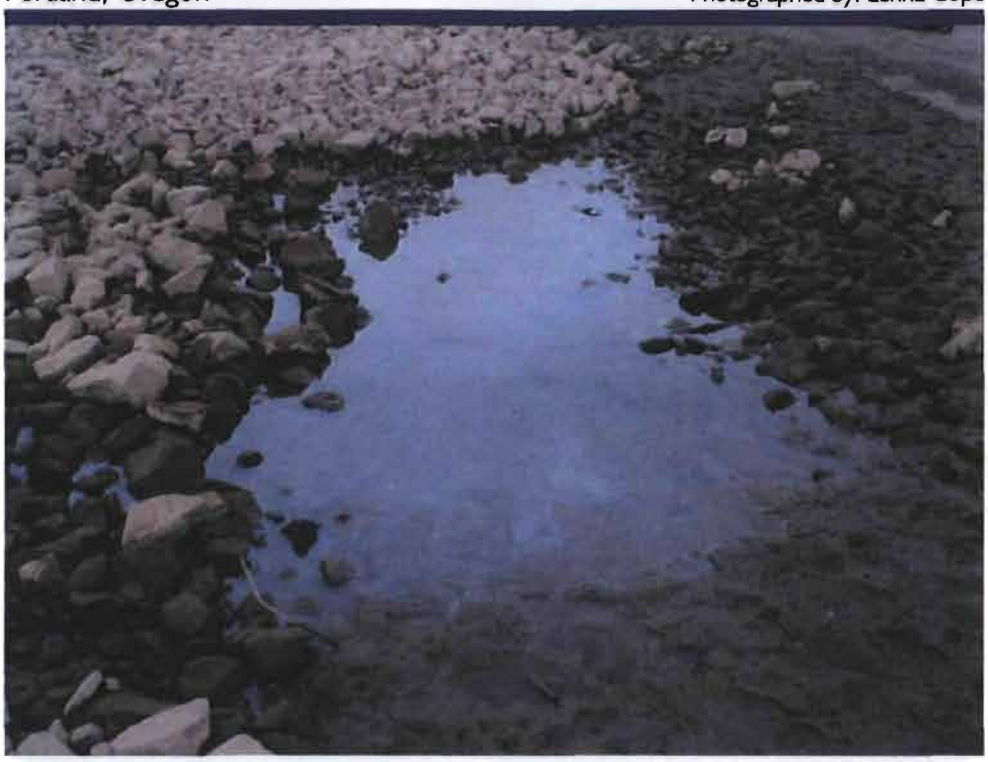


Photo 19 Sheen in puddle near organoclay mats in TFA.

Direction: North *Date: 6/27/2007* *Time: 14:35*

Photo 20 Sheen in puddle near organoclay mats in TFA.

Direction: South *Date: 6/27/2007* *Time: 14:38*

B

Environmental Monitoring and Reporting Plan

Included only with the O&M Report CD.

C Environmental Monitoring Report

Included only with the O&M Report CD.

D Daily Construction Monitoring Forms

ecology and environment, inc.

DAILY FIELD REPORT NO.: 1

Date: 06/26/07 **Day:** 1

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	°F
Part Cldy:		Midday:	°F
Overcast:		Afternoon:	82 °F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	6	three divers, three crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks
		Kevin Parrett	DEQ	Onsite for monthly meeting, briefly observed rock placement.

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	Loaded with 6-inch and 10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
Dive Crew Boat	
(1) Skiff	
CAT 308C Excavator	
CAT 930G Loader	
Tug Boat	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 1

Date: 06/26/07 **Day:** 1

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed earlier in day prior to construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC used coordinates provided by E&E to approximately locate placement areas four and five using a GPS equipped crane. Once the areas were approximately located using the crane, AAC divers entered the water and visually delineated the areas. Buoys were used to mark the locations for subsequent rock placement.

2. AAC placed three clam shell buckets of 6-inch minus rock each on placement areas four and five (total of 6). Each clam shell holds approximately 4-5 CY of material. The crane was equipped with Hypack software and used to electronically record the location of each clam shell bucket placed. AAC used spuds to hold the crane barge in place while placing material, the spuds were located outside the sediment cap.

3. AAC divers verified rock placement by visually inspecting placement areas, probing with a metal rod, and digging through newly placed material to verify thickness. Divers found that placement locations four and five received sufficient material to reach the specified 1-foot thickness over the area.

4. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no readings exceeded the allowable increase.

NOTES/ISSUES

1. During site beach inspections earlier in the day (prior to construction activities), spots of sheen were observed at the southern end of the site near the retention pond spillway and along the shore at the organoclay mats placed in the TFA. At the organoclay mats sheets of sheen were observed in four locations along the shore that corresponded to puddles left by the low tide. Water samples were collected from the four locations, as well as four non-affected locations, for analysis by the DEQ contract lab. Spots of sheen were also observed in Willamette Cove. None of the observed sheen was a result of construction activities, and no source could be identified.

2. AAC delayed in starting rock placement because of scheduling material delivery and repairing a broken spud on the crane barge.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 6/26/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 2

Date: 06/27/07 **Day:** 2

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:		Morning:	62 °F
Part Cldy:	x	Midday:	68 °F
Overcast:	x	Afternoon:	73 °F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	9	three divers, three crane barge crew, two repairmen, one intern

VISITORS

Time In	Time Out	Name	Representing	Remarks

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	Loaded with 6-inch and 10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
Dive Crew Boat	
(1) Skiff	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	

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DAILY FIELD REPORT NO.: 2

Date: 06/27/07 **Day:** 2

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ
E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed during afternoon beach inspections but not associated with construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC used coordinates provided by E&E to approximately locate placement areas one, two, and three using a GPS equipped crane. Once the areas were approximately located using the crane, AAC divers entered the water and visually delineated the areas. Buoys were used to mark the locations for subsequent rock placement. Since locations one through three are well within the limits of the sediment cap, the crane barge was "live boated" while it is being used to mark locations.

2. AAC placed 6-inch minus rock on placement areas one, two, and three. The crane was equipped with Hypack software and used to electronically record the location of each clam shell bucket placed at location three. The Hypack software was not working while material was placed at locations one and two, however the GPS locator was working and could still be used to guide the crane to the appropriate locations. Location one was close enough to the edge of the sediment cap that the material could be placed while the crane barge was spudded in location. Locations two and three were closer to shore and required the crane barge to be live boated during material placement.

3. AAC divers verified rock placement by visually inspecting placement areas, probing with a metal rod, and digging through newly placed material to verify thickness. Divers found that placement locations two and three received sufficient material to reach the specified 1-foot thickness over the area. Location one was found to have a deficient area of approximately 6x6' and required additional material placement. AAC placed the remaining 6-inch minus rock at location one.

4. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no readings exceeded the allowable increase.

5. AAC divers delineated placement area six (embayment). Divers initially probed the edges previously marked by buoys, and placed additional buoys at approximately 20' intervals, they then visually inspected the river bottom to verify their findings.

6. AAC delivered the placement barge that will be used in the embayment to the site and secured it to the crane barge. No material placement occurred in the embayment.

NOTES/ISSUES

1. During afternoon beach inspections several areas of sheen were observed. Although there was no sheen present during the morning beach inspection water levels were high, and the afternoon sheen was consistent with the sheen observed on 6/26/2007 during the low tide. Descriptions of sheen observed today include; one approximately 1x4" spot of sheen and residual sheen on sand approximately 40-50 feet north of the TFA organoclay (OC) mats, sheen present at the same locations at the OC mats and south end of site as on 6/26/2007, sheen also present in Willamette Cove at same locations as on 6/26/2007. No source could be identified.

Prepared By:	Lenna Cope, E & E oversight personnel		
Signature:		**Date:**	6/27/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 3

Date: 06/28/07 **Day:** 3

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:		Morning:	55 °F
Part Cldy:		Midday:	60 °F
Overcast:	x	Afternoon:	°F
Rain:	x		
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	3	three crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks
10:00	14:30	Kevin Parrett	DEQ	Observe construction activities

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(1) Skiff	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 3

Date: 06/28/07 **Day:** 3

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed throughout the day but not associated with construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: Time frame of material placement did not warrant turbidity readings, only one load of material placed.

WORK COMPLETED

1. AAC prepared embayment placement barge (EPB) for activities including; testing access into embayment, placing mud mats on EPB, placing excavator on EPB, removing spuds from EPB, testing access into embayment a second time, and removing miscellaneous equipment from EPB.

2. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB.

3. AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and a skiff to provide side to side control. Once in the embayment AAC started at the north end of the area previously delineated by buoys and began to place material. AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. One load of material was placed today because low water limited access to the embayment.

4. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

NOTES/ISSUES

1. During morning beach inspections (7:30 am), prior to construction activities, large sheets of sheen were observed from the north shore of the embayment extending under the Burlington Northern Railroad Bridge and along the entire shore of Willamette Cove (WC). At approx. 10:30 am the sheen was still present in spots but had decreased significantly since the morning. At approx. 12:15 Kevin Parrett performed beach inspection and found sheen in WC to be significant and discovered the sheen was coming from somewhere downstream of WC. The spill was reported to the DEQ emergency spill number (1-800-452-0311) and the coast guard was notified. Responders arrived at site at approx. 13:25, Kevin Parrett described location of sheen. Results of their investigation are unknown to us at this time.

2. AAC notifies E&E that they will not be onsite tomorrow (6/29/2007) because their barge crew has to be on another job, and the crane barge has to be demobilized for repairs. E&E scheduled a meeting for 6/29/2007 to discuss schedule and construction progress.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 6/28/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 4

Date: 07/03/07 **Day:** 4

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	60 °F
Part Cldy:		Midday:	70 °F
Overcast:		Afternoon:	°F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	5	five crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 4

Date: 07/03/07 **Day:** 4

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed prior to construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. Once in the embayment AAC started at the north end of the area previously delineated by buoys and continued to place material. AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. Three loads of material were placed today prior to low water limiting access to the embayment.

2. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB. Three loads were placed onto the EPB over the course of the day. The first load placed for the day was previous placed on the EPB so that placement could commence first thing in the morning, the third load placed on the EPB will be placed on 7/5/2007.

3. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

4. E & E collected two sets of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no readings exceeded the allowable increase.

NOTES/ISSUES

1. During morning beach inspection, prior to construction activities, small bands of sheen were observed at the north shore of the embayment and approximately seven quarter size spots of sheen were observed near the test organoclay mat in TFA. Sheen was also observed at the organoclay mats in the TFA in the locations noted on 6/26/2007. The sheen ranged in size from quarter to fist sized. One fist size spot of sheen observed in Willamette Cove.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/3/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 4

Date: 07/03/07 **Day:** 4

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	60 °F
Part Cldy:		Midday:	70 °F
Overcast:		Afternoon:	°F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	5	five crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 4

Date: 07/03/07 **Day:** 4

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ
E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed prior to construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. Once in the embayment AAC started at the north end of the area previously delineated by buoys and continued to place material. AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. Three loads of material were placed today prior to low water limiting access to the embayment.

2. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB. Three loads were placed onto the EPB over the course of the day. The first load placed for the day was previous placed on the EPB so that placement could commence first thing in the morning, the third load placed on the EPB will be placed on 7/6/2007.

3. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

4. E & E collected two sets of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no readings exceeded the allowable increase.

NOTES/ISSUES

1. During morning beach inspection, prior to construction activities, small bands of sheen were observed at the north shore of the embayment and approximately seven quarter size spots of sheen were observed near the test organoclay mat in TFA. Sheen was also observed at the organoclay mats in the TFA in the locations noted on 6/26/2007. The sheen ranged in size from quarter to fist sized. One fist size spot of sheen observed in Willamette Cove.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/3/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 6

Date: 07/06/07 **Day:** 6

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	68 °F
Part Cldy:		Midday:	84 °F
Overcast:		Afternoon:	°F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	5	five crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks
7:00	12:00	Kevin Parrett	DEQ	Observe construction activities
7:00	11:30	Eric White	E&E	Observe construction activities

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 6

Date: 07/06/07 **Day:** 6

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ
E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed prior to construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. AAC continue to generally work their way south in the embayment. AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. Two and a half loads of material were placed today prior to low water limiting access to the embayment.

2. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB. Two and a half loads were placed onto the EPB over the course of the day. The first load placed for the day was previous placed on the EPB so that placement could commence first thing in the morning, the third load placed on the EPB will be placed on 7/9/2007.

3. AAC used metal rods to probe the embayment area to verify locations that have had material placed and mark the approximate edge for work to commence on 7/9/2007.

4. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

5. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no compliance readings exceeded the allowable increase.

NOTES/ISSUES

1. Sheen observed in Willamette Cove near ACB label organocaly sample location B2, approximately fist size.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/6/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 7

Date: 07/09/07 **Day:** 7

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	°F
Part Cldy:		Midday:	80 °F
Overcast:		Afternoon:	85 °F
Rain:			
Fog:			
Snow:			
Other:			

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	4	four crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 7

Date: 07/09/07 **Day:** 7

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: Yes, sheen was observed prior to construction activities. See note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC attempted to maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. Water levels for today were predicted to be very low, even at high tide. AAC arrived onsite at 10:00 am to prepare and be ready to enter the embayment at high tide. Starting at 12:40 they began to enter the embayment, at 13:30 AAC dumped part of the 10-inch minus rock within the foot print of the sediment cap in an attempt to lower the draft of the barge, but at 14:00 stopped for the day without ever getting high enough water to enter the embayment. AAC, E&E, and DEQ agreed to commence work at 23:00 to work during the high tide during the night.

2. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

3. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no compliance readings exceeded the allowable increase.

NOTES/ISSUES

1. Sheen was observed at the same locations at the OC mats as on 6/26/2007, ranging from dime to fist size. No sheen observed in Willamette Cove.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/9/2007

ecology and environment, inc.

DAILY FIELD REPORT NO.: 8

Date: 7/9/07 to 7/10/07 **Day:** 8

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	70 °F
Part Cldy:		Midday:	°F
Overcast:		Afternoon:	°F
Rain:		Night:	75 °F
Fog:			
Snow:			
Other:	night time		

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	4	four crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 8

Date: 7/9/07 to 7/10/07 **Day:** 8

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: No, see note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. AAC continue to generally work their way south in the embayment. AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. Three loads of material were placed today prior to low water limiting access to the embayment. This material was placed during the night of 7/9/2007 to 7/10/2007 in order to work during the highest tide. E & E instructed AAC not to place a fourth load of material so that diver inspections could be performed while there was enough material remaining to address an potentially deficient areas.

2. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB. Three loads were placed onto the EPB over the course of the day. The first load placed for the day was previous placed on the EPB so that placement could commence first thing in the morning, the third load placed on the EPB will be placed on 7/11/2007.

3. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

4. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no compliance readings exceeded the allowable increase.

NOTES/ISSUES

1. Work was performed during night time. For safety reasons E&E personnel was not on shoreline during night hours and stayed on the AAC barge at all times, therefore beach inspections were not performed.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/9/07 to 7/10/07

ecology and environment, inc.

DAILY FIELD REPORT NO.: 9

Date: 7/10/07 to 7/11/07 **Day:** 9

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

Weather		Temperature	
Clear:	x	Morning:	72 °F
Part Cldy:		Midday:	°F
Overcast:		Afternoon:	100 °F
Rain:		Night:	80 °F
Fog:			
Snow:			
Other:	night time		

CONTRACTOR(S)/SUBCONTRACTOR(S)

	Contractor/Subcontractor	Crew Size	Remarks
	Advanced American Construction	4	four crane barge crew

VISITORS

Time In	Time Out	Name	Representing	Remarks
14:00	17:00	Eric White	E&E	Oversight of diver inspections

EQUIPMENT ONSITE	MATERIALS DELIVERED TO SITE
Material Barge	10-inch minus rock, quantity unknown
Crane Barge - Manitowoc	
(2) Skiffs	
CAT 308C Excavator	
CAT 930G Loader	
(1) Tug Boat	
(1) Crew Boat (used as Tug)	
Embayment Placement Barge (EPB)	

ecology and environment, inc.

DAILY FIELD REPORT NO.: 9

Date: 7/10/07 to 7/11/07 **Day:** 9

Project Title: McCormick and Baxter Armor Repair Action **Client:** ODEQ

E & E Project No.: 002688.OY28.08

NONCONFORMANCES NOTED	WHO WAS NOTIFIED?
None	

SAFETY CONCERNS NOTED	WHO WAS NOTIFIED?
None	

WATER QUALITY CONDITIONS

NAPL sheen associated with construction observations: No

Sheen associated with construction observations: No, see note 1.

Construction induced turbidity observations: Turbidity present at point of placement, but not upstream or downstream.

Turbidity readings above action levels measured during construction period: None

WORK COMPLETED

1. During the day on 7/10/2007 AAC divers performed diver verification of the material placed in the embayment, following rock placement during the night on 7/9/2007 to 7/10/2007. Divers identified an area along the northern edge of the embayment that required additional material to be placed. Divers marked the area with buoys. Divers also performed inspections of three additional areas identified during the differencing imaging analysis. Two of the area were observed to have sufficient armoring, the third area was sandy, but it is likely the sand has accumulated over the armoring and that sufficient armoring is present below the sand. No further repair actions will occur at this time at the three additional areas.

2. During the night of 7/10/2007 to 7/11/2007 AAC maneuvered the EPB into the embayment using a crew boat as a tug boat and two skiffs to provide side to side control. AAC placed two loads of material in the area previously identified by divers to need more 10-inch minus rock to achieve the specified thickness of 15". AAC used the excavator to either place rock with the bucket, or push rock off the front of the EPB using the attached blade. If material was pushed off the front of the EPB the tug boat was used to move the EPB back and forth to spread the material over the area. This additional rock placement utilized the remaining 10-inch minus rock.

3. AAC loaded material onto the EPB from the material barge using the crane and a material box with dimensions of approximately 8x8x2'. The loader was used to place 10-inch minus rock from the material barge into the material box, the crane was then used to transfer the 10-inch minus rock onto the EPB. One load was placed onto the EPB over the course of the night. The first load placed for the night was previous placed on the EPB so that placement could commence first thing in the night.

4. AAC placed sorbent boom around the work area prior to construction activities, the south end of the work area was left open to allow access and movement of the EPB. At the end of the work day AAC placed sorbent boom around the entire work area, including the south end.

5. E & E collected one set of turbidity readings. A set of turbidity readings includes three locations; point of discharge, downstream, and upstream. Depending on water depth at the three locations turbidity readings were taken at the lower, middle, and upper depths of the river. The established background level is 4.35 NTU and the allowable increase is 5 NTU; no compliance readings exceeded the allowable increase.

6. This is the final day (night) of construction, AAC will demobilize their crane barge during the day.

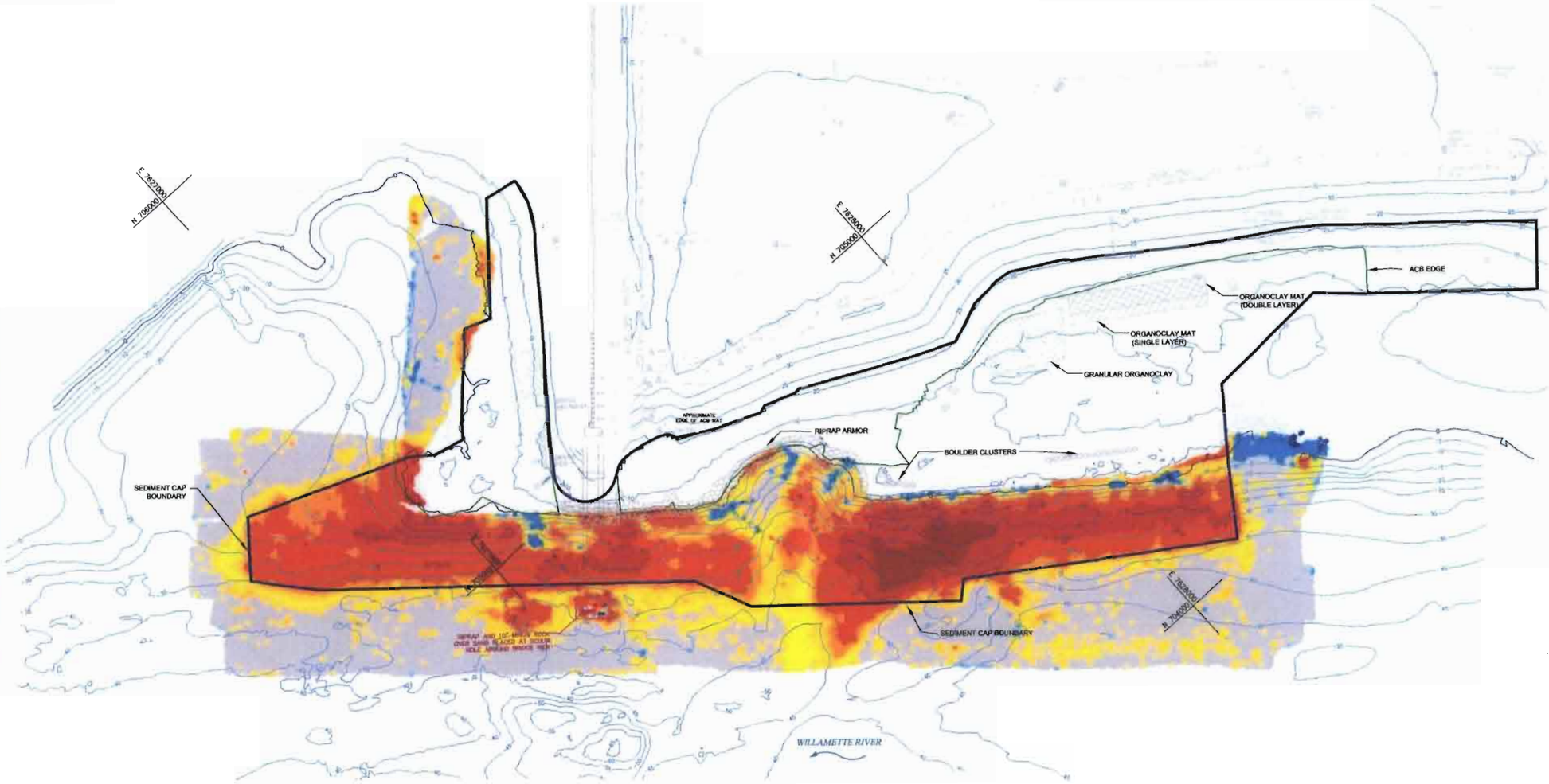
NOTES/ISSUES

1. Work was performed during night time. For safety reasons E&E personnel was not on shoreline during night hours and stayed on the AAC barge at all times, therefore beach inspections were not performed.

Prepared By: Lenna Cope, E & E oversight personnel

Signature: **Date:** 7/10/07 to 7/11/07

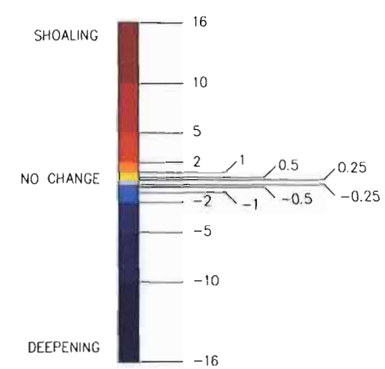
E Bathymetric Survey Difference Analysis Images



NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: June 1st and 11th, 2004 vs. November 5, 2004.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
6. Contour Interval: 5 feet. Contours represent a composite surface from November, 2004; January, 2006; and December 2006 upland surveys and April, 2006 in-water survey.
7. The analysis was generated from a 3-foot difference grid of the multibeam bathymetry. The 3-foot grid values of the June 1st and 11th, 2004 survey were subtracted from the November 5th, 2004 survey to produce the difference grid.
8. Water surface elevations were obtained from a Real-Time Kinematic Global Positioning System (RTK GPS). An RTK GPS base station was deployed to provide real-time GPS correctors. RTK correctors were applied to the shipboard GPS for logging of water surface elevations at one-second intervals. A 30-second average of RTK GPS observations was used for correcting multibeam soundings to NAVD88 elevations.
9. Horizontal positions were acquired with an Applanix POS/MV, combined inertial and Real Time Kinematic Global Positioning System (RTKGPS).
10. Depths were acquired with a Reson Seabat 8101 multibeam bathymetric sonar integrated with an Applanix POS/MV positioning and motion reference system.

NOVEMBER 2004 MINUS JUNE 2004
SURFACE DIFFERENCES (FEET)



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JUNE 2004 TO NOVEMBER 2004 DIFFERENCE ANALYSIS

NOVEMBER 2004 MONITORING SURVEY

McCORMICK AND BAXTER SITE

ECOLOGY & ENVIRONMENT, INC.
WILLAMETTE RIVER, PORTLAND, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON JON L. DASLER 2442 RENEWAL 12/31/07

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

REVISIONS:	APPD.

DATE: 8/22/2007
DESIGN: MJCH
DRAWN: MJCH
CHECKED:
REVISION NUMBER:

SCALE: 1"=100'

PROJECT NUMBER: ECEN0000-0019

DRAWING FILE: 01_diff_Nov04_Jun04.dwg

SHEET NO. 1 OF 6

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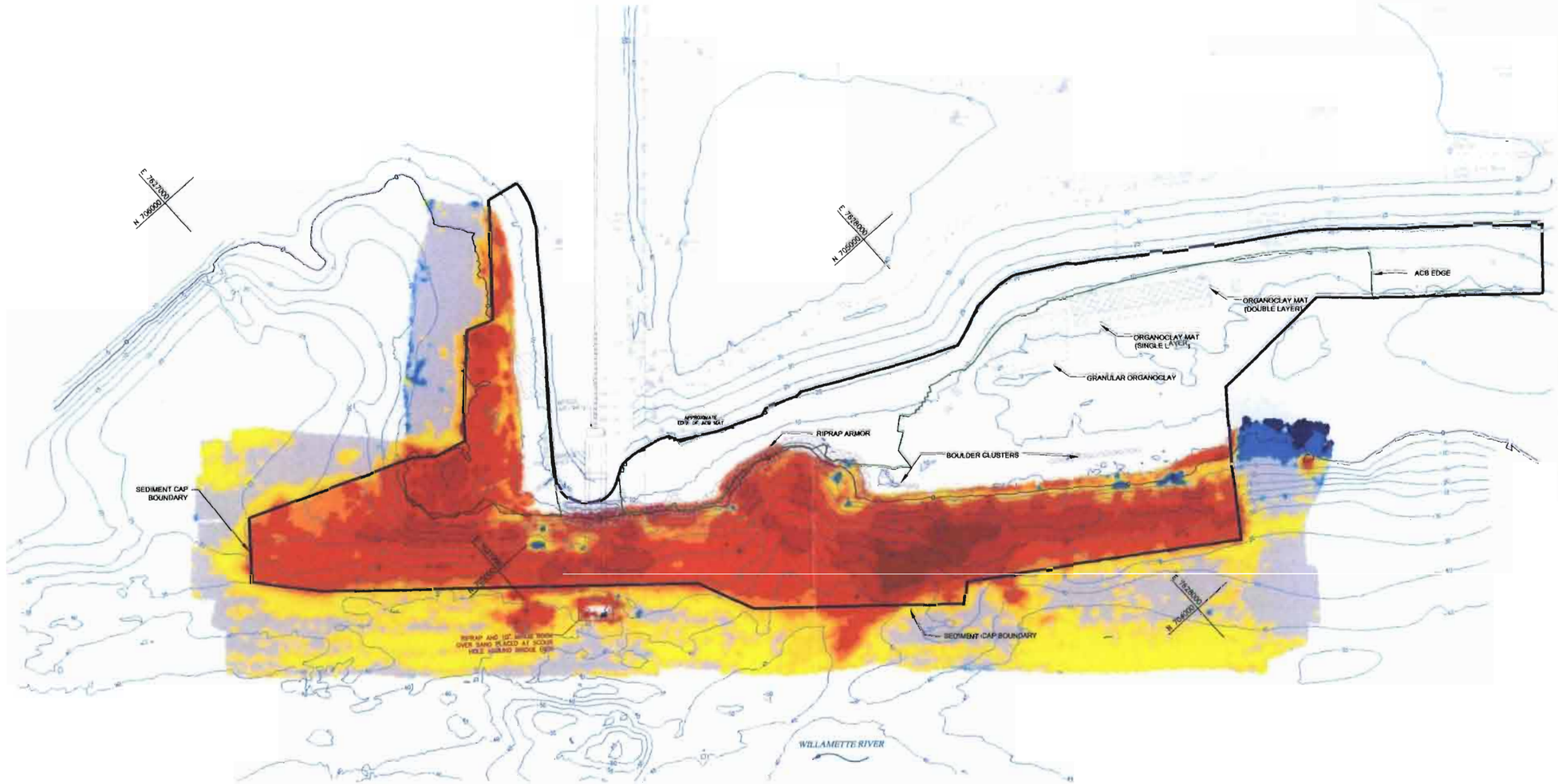
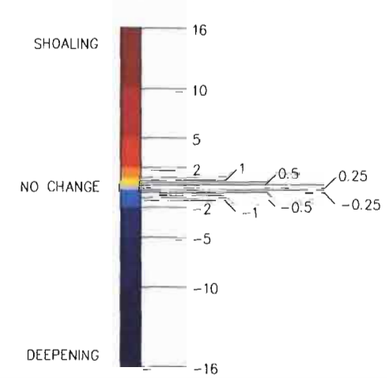


NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: June 1st and 11th, 2004 vs. November 14, 2005.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
6. Contour Interval: 5 feet.
   Contours represent a composite surface from November, 2004; January, 2006; and December 2006 upland surveys and April, 2006 in-water survey.
7. The analysis was generated from a 3-foot difference grid of the multibeam bathymetry. The 3-foot grid values of the June 1st and 11th, 2004 survey were subtracted from the November 14th, 2005 survey to produce the difference grid.
8. Water surface elevations were obtained from a Real-Time Kinematic Global Positioning System (RTK GPS). An RTK GPS base station was deployed to provide real-time GPS correctors. RTK correctors were applied to the shipboard GPS for logging of water surface elevations at one-second intervals. A 30-second average of RTK GPS observations was used for correcting multibeam soundings to NAVD88 elevations.
9. Horizontal positions were acquired with an Applanix POS/MV, combined inertial and Real Time Kinematic Global Positioning System (RTKGPS).
10. Depths were acquired with a Reson Seabat 8101 multibeam bathymetric sonar integrated with an Applanix POS/MV positioning and motion reference system.

NOVEMBER 2005 MINUS JUNE 2004
SURFACE DIFFERENCES (FEET)



0 50 100 200
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JUNE 2004 TO NOVEMBER 2005 DIFFERENCE ANALYSIS

NOVEMBER 2005 MONITORING SURVEY

McCORMICK AND BAXTER SITE

ECOLOGY & ENVIRONMENT, INC.
WILLAMETTE RIVER, PORTLAND, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JON L. DASLER
RENEWAL 12/31/07

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland, Oregon 97201
Phone: 503.223.6663

REVISIONS:	APPD.

DATE: 8/22/2007
DESIGN: MJCH
DRAWN: MJCH
CHECKED:
REVISION NUMBER:

SCALE: 1"=100'

PROJECT NUMBER:
ECEN0000-0019

DRAWING FILE:
02_diff_Nov05_Jun04.dwg

SHEET NO.
2
OF 6

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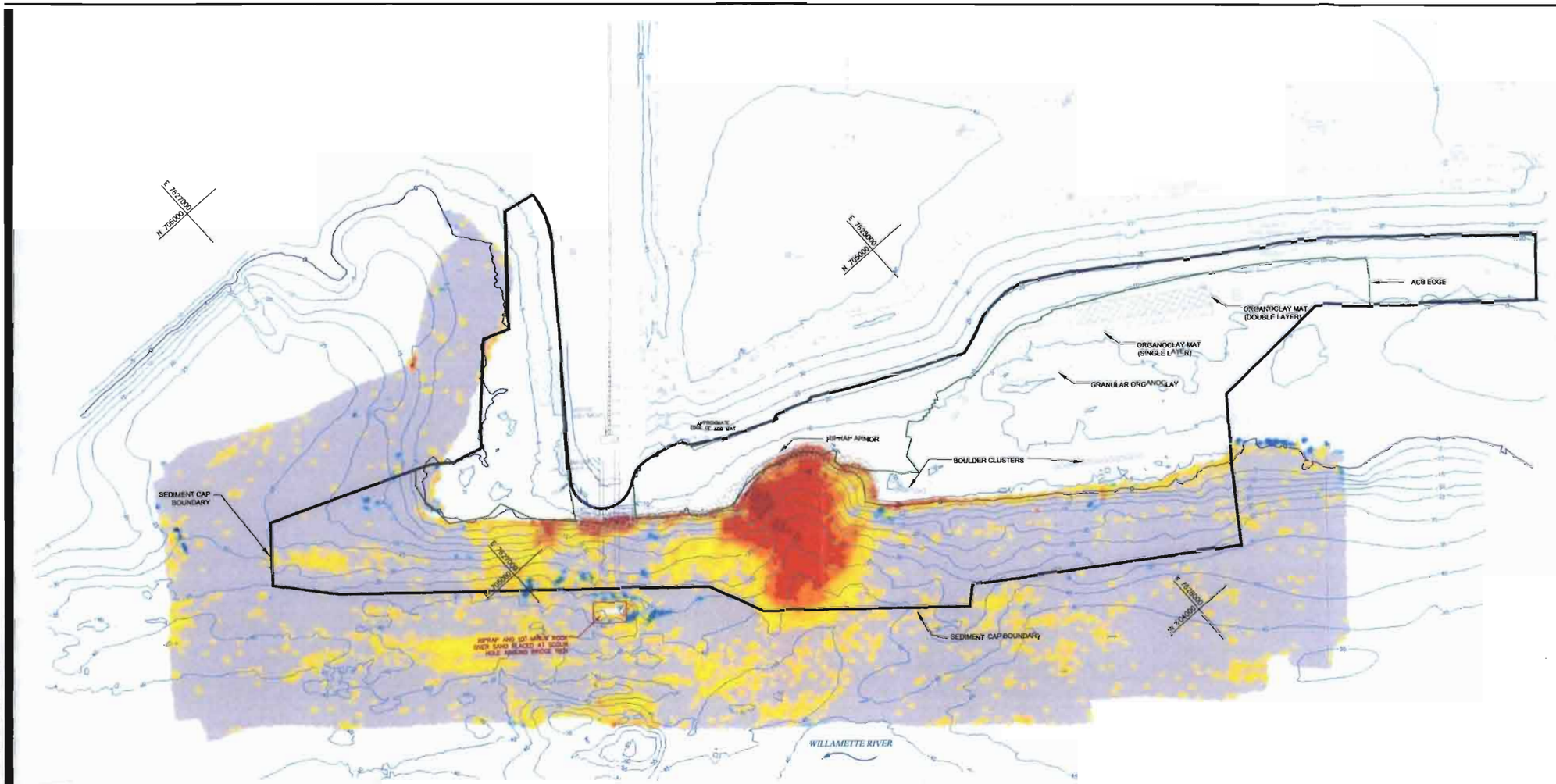
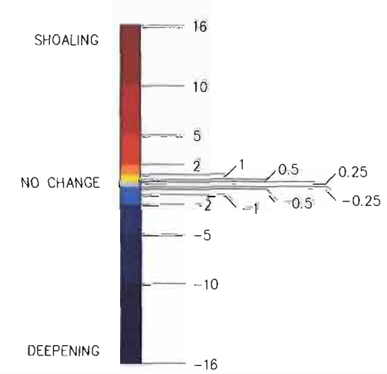
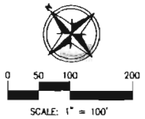


NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: November 5th, 2004 vs. November 14, 2005.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91); State Plane Coordinate System (SPCS); Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
6. Contour Interval: 5 feet.
   Contours represent a composite surface from November, 2004; January, 2006; and December 2006 upland surveys and April, 2006 in-water survey.
7. The analysis was generated from a 3-foot difference grid of the multibeam bathymetry. The 3-foot grid values of the November 5th, 2004 survey were subtracted from the November 14th, 2005 survey to produce the difference grid.
8. Water surface elevations were obtained from a Real-Time Kinematic Global Positioning System (RTK GPS). An RTK GPS base station was deployed to provide real-time GPS correctors. RTK correctors were applied to the shipboard GPS for logging of water surface elevations at one-second intervals. A 30-second average of RTK GPS observations was used for correcting multibeam soundings to NAVD88 elevations.
9. Horizontal positions were acquired with an Applanix POS/MV, combined Inertial and Real Time Kinematic Global Positioning System (RTKGPS).
10. Depths were acquired with a Reson Seabat 8101 multibeam bathymetric sonar integrated with an Applanix POS/MV positioning and motion reference system.

NOVEMBER 2005 MINUS NOVEMBER 2004
SURFACE DIFFERENCES (FEET)





NOVEMBER 2004 TO NOVEMBER 2005 DIFFERENCE ANALYSIS

NOVEMBER 2005 MONITORING SURVEY

McCORMICK AND BAXTER SITE

ECOLOGY & ENVIRONMENT, INC.
WILLAMETTE RIVER, PORTLAND, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON JON L. DASLER 2003 RENEWAL: 12/31/07

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

REVISIONS: APPD.

DATE: 8/22/2007
DESIGN: MJCH
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PROJECT NUMBER: ECEN0000-0019

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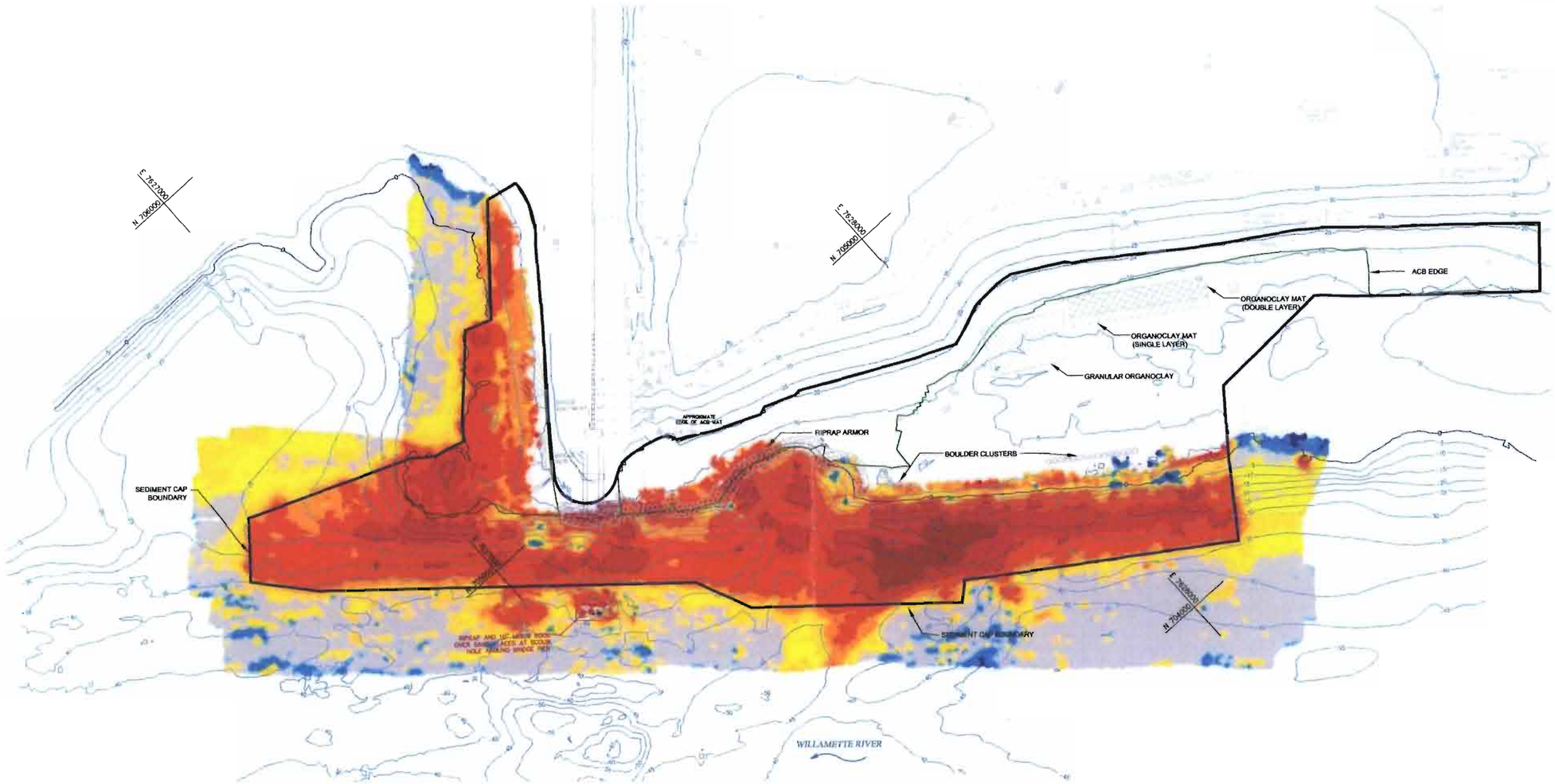
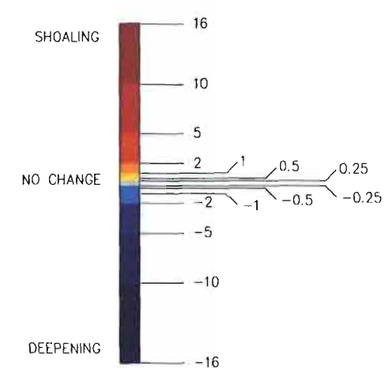


NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: June 1st and 11th, 2004 vs. April 26th, 2006.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
6. Contour Interval: 5 feet.
   Contours represent a composite surface from November, 2004; January, 2006; and December 2006 upland surveys and April, 2006 in-water survey.
7. The analysis was generated from a 3-foot difference grid of the multibeam bathymetry. The 3-foot grid values of the June 1st and 11th, 2004 survey were subtracted from the April 26th, 2006 survey to produce the difference grid.
8. Water surface elevations were obtained from a Real-Time Kinematic Global Positioning System (RTK GPS). An RTK GPS base station was deployed to provide real-time GPS correctors. RTK correctors were applied to the shipboard GPS for logging of water surface elevations at one-second intervals. A 30-second average of RTK GPS observations was used for correcting multibeam soundings to NAVD88 elevations.
9. Horizontal positions were acquired with an Applanix POS/MV, combined inertial and Real Time Kinematic Global Positioning System (RTKGPS).
10. Depths were acquired with a Reson Seabat 8101 multibeam bathymetric sonar integrated with an Applanix POS/MV positioning and motion reference system.

SPRING 2006 MINUS JUNE 2004
SURFACE DIFFERENCES (FEET)



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SCALE: 1" = 100'

JUNE 2004 TO SPRING 2006 DIFFERENCE ANALYSIS

SPRING 2006 MONITORING SURVEY

McCORMICK AND BAXTER SITE

ECOLOGY & ENVIRONMENT, INC.
WILLAMETTE RIVER, PORTLAND, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON JON L. DASLER 2432 RENEWAL 12/31/07

DAVID EVANS AND ASSOCIATES INC.
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REVISIONS:	APPD.

DATE: 8/22/2007
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SCALE: 1"=100'

PROJECT NUMBER: ECEN0000-0019

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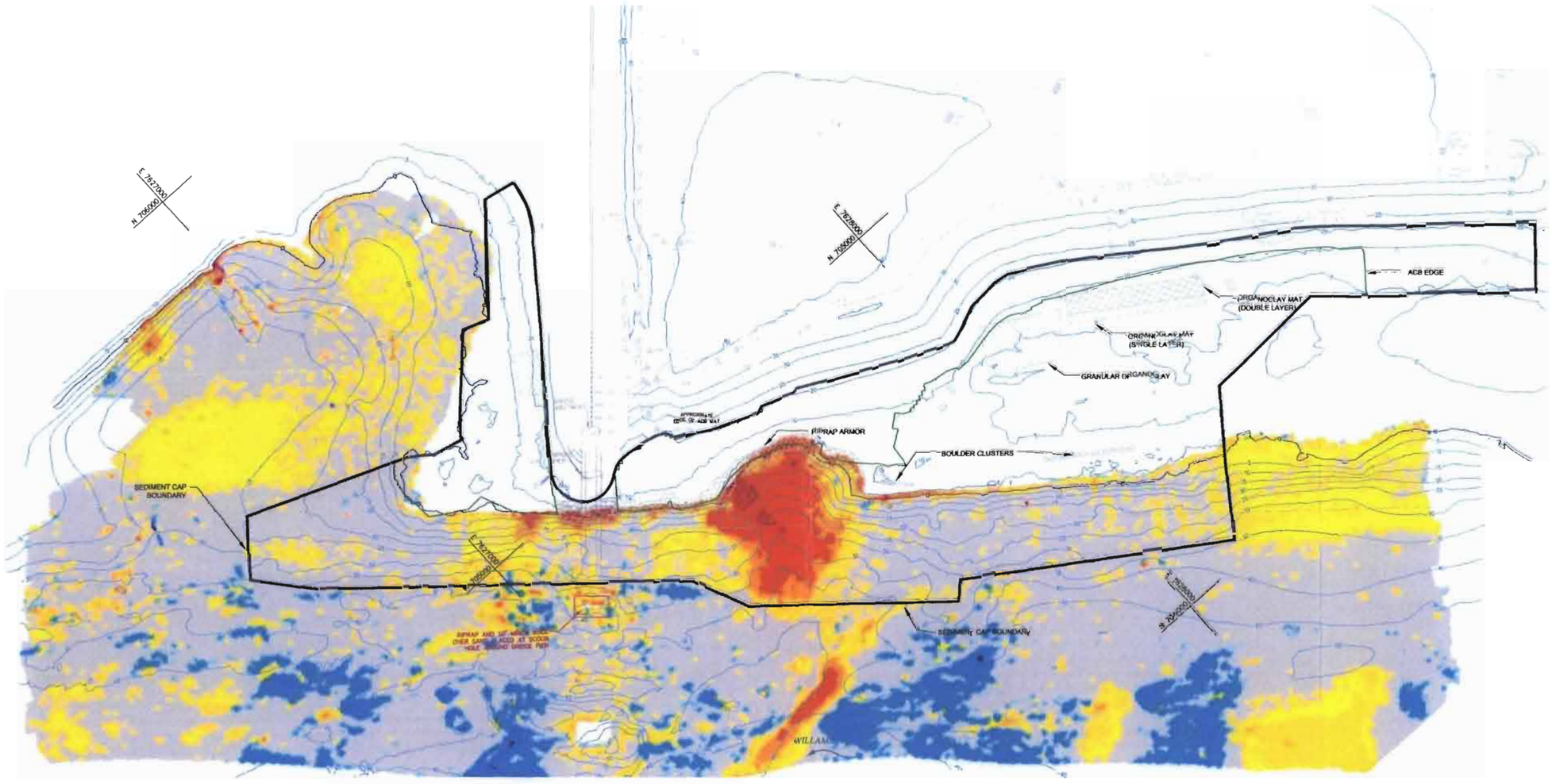

NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: November 5th, 2004 vs. April 26th, 2006.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
5. Units: International Feet.
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   Contours represent a composite surface from November, 2004; January, 2006; and December 2006 upland surveys and April, 2006 in-water survey.
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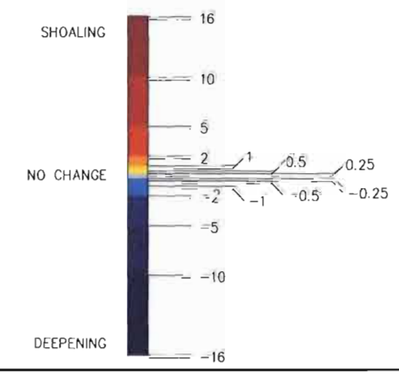
SPRING 2006 MINUS NOVEMBER 2004
SURFACE DIFFERENCES (FEET)



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SCALE: 1" = 100'

NOVEMBER 2004 TO SPRING 2006 DIFFERENCE ANALYSIS
SPRING 2006 MONITORING SURVEY
McCORMICK AND BAXTER SITE
ECOLOGY & ENVIRONMENT, INC.
WILLAMETTE RIVER, PORTLAND, OREGON

REGISTERED PROFESSIONAL LAND SURVEYOR

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DATE: 8/22/2007
DESIGN: MJCH
DRAWN: MJCH
CHECKED:
REVISION NUMBER:

SCALE: 1"=100'

PROJECT NUMBER: ECEN0000-0019

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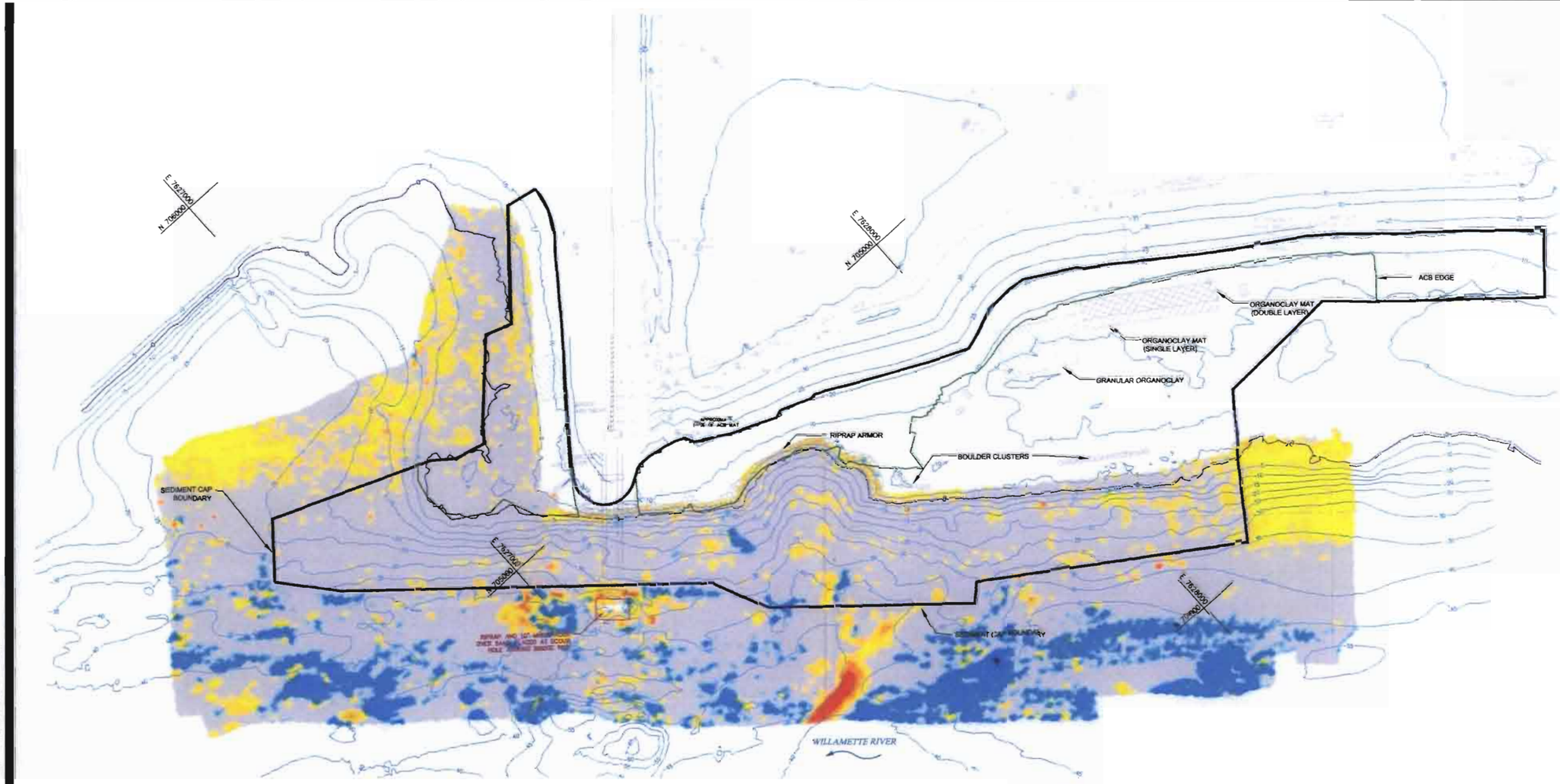

NOTES:

1. This drawing presents a comparison of multibeam bathymetric surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Surveys: November 14th, 2005 vs. April 26th, 2006.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
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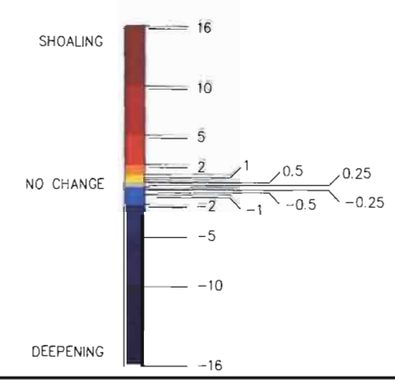
SPRING 2006 MINUS NOVEMBER 2005
SURFACE DIFFERENCES (FEET)



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SCALE: 1" = 100'

NOVEMBER 2005 TO SPRING 2006 DIFFERENCE ANALYSIS
SPRING 2006 MONITORING SURVEY
McCORMICK AND BAXTER SITE
ECOLOGY & ENVIRONMENT, INC.
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REVISIONS:	APPD.

DATE: 8/22/2007
DESIGN: MJCH
DRAWN: MJCH
CHECKED:
REVISION NUMBER:

SCALE: 1"=100'

PROJECT NUMBER: ECEN0000-0019

DRAWING FILE: 06_diff_Spring06_Nov05.dwg

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Attachment F

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204-1912 ▪ Sam Adams, Commissioner ▪ Dean Marriott, Director

General Observations

The City of Portland, Bureau of Environmental Services (BES) is providing the Oregon Department of Environmental Quality (DEQ) with vegetation planning and maintenance services under an Intergovernmental Agreement (IGA) at the McCormick and Baxter Superfund site located in North Portland. The revegetation project began in 2005 and, after the second growing season, continues to perform above expectations. Most of the weed control has been accomplished with BES staff (rather than contract crews) by utilizing a preventative noxious weed control approach. Several difficult noxious weed species have been detected on this site; to date all have been controlled before they became a large scale problem, usually through a combination of herbicide application and manual pulling.

Other cost savings have resulted from scheduled maintenance that did not need to be performed;'; including mowing and a second year of weedy vegetation mashing (mechanical compression) in the riparian component of the site.

Mice or voles are becoming much more numerous but there still has been little damage. Beaver damage has not been observed; steel fence caging of established trees may be needed in the future.

Additional seeding (see list below of species seeded) has been applied to maintain full vegetative cover on the project site, especially in the areas that did not have any woody plant material specified in the IGA.

Site Component	Treatment Acres	Festuca rubra commutata	Collomia grandiflora	Coreopsis atkinsonlana	Eriophyllum lanatum	Gilia capitata	Grindelia integrifolia	Iris tenax	Lotus pursh	Lupinus polyphyllus	Prunella vulgaris	Sisyrinchium angustifolium	Total lbs.
M & B 2006 - swales & Natural Tree/Shrub	15	300	5	25	9	2	50	2	8	10	20	1	432
M & B 2007 - Impermeable Soil Cap	10	125	0	0	0	1	0	0	10		0	0	136
TOTALS:		**425**	**5**	**25**	**9**	**3**	**50**	**2**	**18**	**10**	**20**	**1**	**568**

Long term control and prevention of noxious weeds is a concern. Many surrounding off-site areas have severe noxious weed problems, including scotch broom on the rail road grade and butterfly bush from the Triangle Park industrial property, located south of the site. Therefore, the noxious weed potential is expected to remain high for this site for the foreseeable future.

Vegetative Components

Upper Riparian 18.7 to 30.0 NGDV (3.6 acres)

General Observations

Woody plants planted adjacent to placed driftwood have outperformed the other woody plants at other site locations. The alder have grown much faster than any other tree species, especially those located in the driftwood areas. The initial number of planted alders was fairly low but their impact is significant in relation to canopy closure. Alder are naturally fast-growing trees, and while other species may have the same numbers surviving on site, the alder are more conspicuous because it is a fast growing species.

As predicted, the groundcover species mix is shifting from the initially seeded species, notably lupines, and moving towards clovers and native and non-native grasses.

In spring 2006 after flowering, the seeded lupine needed to be mechanically compressed by a manual labor crew in order to provide adequate room for the woody plants that had been planted. As a result of this species shift, we did not need to repeat treatment this year. Currently there is about a 50/50 mix of native and non-native species present. Most of the non-natives species are not invasive or overly-competitive and are doing a good job of preventing erosion and invasive species encroachment. Only the invasive knapweeds, thistles and yellow mustard need to be managed; a combination of herbicide spot spraying and manual pulling has been effective to date.

Performance Standards per Vegetation Plan

- Plant 820 trees and 829 shrubs per acre
- 80% survival after one year, at the end of the initial growing season. Achieved as recorded in 2006 Monitoring Report.
- Invasive species less than 10% of all plants by year five; 2011.
- 80% herbaceous and shrub cover after five years; October 2011.
- 30% canopy closure after five years; October 2011.
- Minimum of 8 shrub species and 3 tree species present, no species to exceed 50% of the total stem count.

Monitored Status and Recommendations as of October 2007:

- Woody species survival rate is 68% of the initial planted density, additional mortality occurred in the past year; the live stake plant material represents the greatest loss. Live stake plant material planting density was higher in this area, typically a lower survival rate is expected of live stakes when compared to bareroot plantings. However, the site should be able to achieve 30% canopy closure by October 2011, the end of the specified 5 year period without additional planting. Recommendations:

- Consider interplanting with more alder and ash to achieve 30% canopy closure after 5 years; by October 2011. Monitor until Fall 2008 before determining whether inter-planting is needed.
- Apply a small directed amount of slow-release fertilizer to all tree and shrub plantings.

- Herbaceous cover was measured at 100%; a shift from lupine to grasses has occurred, as anticipated. Recommendations:
  - Invasive, aggressive knapweeds, scotch broom, yellow mustard and thistle are somewhat of a concern but will continue to be closely monitored and controlled.
  - Monitor and continue spot treat small infestations of noxious weeds before they spread.

Volunteer Planting Area (1-2 acres)
This area was monitored as part of the Upper Riparian Component, there is no significant difference between this area and the adjacent Riparian area.

Lower Riparian 16.6 to 18.7 NGDV (2.1 acres)

General Observations
Drought has been a limiting factor to achieve the vegetation performance standard for this portion of the project. The irrigation system, as designed, does not fully extend to the bottom portion of this area. The lowest elevation portion of the component is drier than expected. While the planted material currently is below the target performance standard, especially in the lower elevation portion of this component, there are native willow and cottonwood seedlings that are naturally recruiting in this same area of this component. If BES continues to protect and encourage these natural seedlings, the performance standards should be met by October 2011. Extension of the irrigation system and inter-planting could also be considered in the future if the performance standards are not met by Fall 2008.

Again the groundcovers are shifting from the initially seeded species, and moving towards clovers and native and non-native grasses. Most of the non-natives are not invasive; the weed species of concern are the same as the Upper Riparian component - knapweeds, thistles and yellow mustard, with the addition of butterfly bush. The combination of herbicide spot spraying and manual pulling has again been effective on this portion of the site.

Performance Standards per Vegetation Plan
- Plant 540 trees and 1,100 shrubs per acre.
- 80% survival after one year. (Note: achieved, and provided in 2006 monitoring report.)
- Invasive species less than 10% of all plants by year five; Fall 2011.
- 80% herbaceous and shrub cover after five years; Fall 2011.
- Minimum of 9 shrub species and 3 tree species, no species to exceed 50% of the total stem count.

- 30% canopy closure after five years; Fall 2011.

Monitored Status and Recommendations as of October 2007:

- Woody plants survival rate is 62% of the planned density.
  - Monitor and protect both planted and natural seedlings to encourage 30% canopy closure by the end of five years; Fall 2011.
- Herbaceous cover was measured at nearly 100%.
  - Knapweeds, scotch broom, yellow mustard and thistle are a concern but have been successfully controlled. Continue to monitor and spot treat these relatively small infestations to prevent spread and reduce cover.
  - Last year the lupines were competing with the installed woody plants; this was probably the single biggest contributor to plant mortality in the first growing season. The normal shift from the seeded species to grasses and clovers has alleviated this problem. The current groundcover height and density is beneficial to woody plant establishment. Continue to monitor and spot treat these small infestations to prevent spread and reduce cover.
  - Apply a small directed amount of slow-release fertilizer to all tree and shrub plantings.

Natural Tree and Shrub Planting Area (1.1 acres)

General Observations

Planting density for this component was increased considering expectations of high plant loss. Survival of the madrone, oak and hawthorn are excellent.

Performance Standards per Vegetation Plan

- Plant a total of 625 plants per acre.
- 70% survival after one year, October 25, 2006.
- Invasive species less than 10% of all plants by year five; Fall 2011.
- 90% herbaceous and shrub cover after five years; Fall 2011.

Monitored Status and Recommendations as of October 2007:

- Woody plant survival rate was greater than 100% of the original planted density.
  - Final planting density was increased to over 2,000 plants per acre in anticipation of high mortality in this component.
- Herbaceous cover was nearly 100%.
  - Additional wildflowers have been sown in the Natural Shrub and Tree section of this project.
  - Monitor and spot treat small infestations of noxious weeds before they can spread.

Swale and Pond Planting (4.2 acres)

General Observations

Herbaceous species, notably Spanish clover and birdsfoot trefoil are taller than some of the smaller planted shrubs, but the shrubs are establishing well and might even benefit from the shade and nitrogen fixation provided by theses species. The other clovers in the Swale and Pond Planting are also contributing to soil fertility with little or no adverse effect on the woody plant materials. Scotch broom and butterfly bush need to continue to be monitored and treated.

Alder seedlings were recorded in this component and are naturally regenerating in this area.

Performance Standards per Vegetation Plan

- Plant 1,640 shrubs per acre including willow live stakes. (Piper & Sitka willow constituted the bulk of the live stakes in addition to 250 red osier dogwood.)
- 80% survival after one year, fall 2006. Achieved as recorded in 2006 monitoring report.
- Invasive species less than 10% of all plants by 2011.
- 90% herbaceous and shrub cover after five years, 2011.
- A total of 5 shrub species (no tree species); no species to exceed 50% of the total stem count.

Monitored Status and Recommendations as of October 2007:

- Woody shrubs survival rate is 63% of the planned density, includes bare-root and live stake plants.
- Live stake survival was not as successful as the bare-root component, but will be more than adequate to establish a good willow shrub cover.
- In the pond portion of this component the live stakes survived exceptionally well.
- Herbaceous cover was measured at 82%, bare ground was 8%. Additional wildflowers have been sown in this part of the project.
    - Monitor and perform preventive noxious weed control.

Impermeable Soil Cap (15 acres)

General Observations

This area has not been part of the BES formally monitored components for this project because no woody species were designated for this area, only grasses and wildflower or herbaceous species were planted. However, BES has been maintaining this area from the time that the rest of the site was planted.

Initially the hydro-seeded (by DEQ contractors, not BES) grass and wildflower species survived very well on this component. Invasive or noxious weeds were not a problem in the first growing season, fall 2005. At the end of the second

growing season, fall 2006, BES staff observed a rapid decline in the vigor of the hydro-seeded species, especially the slender hairgrass. Soil pH, soil nutrition, and species selection could all be factors in this trend. The active drainage system may also hasten the drought period for this area, which is extremely dry by early to mid summer.

As the grasses have declined, invasive weed species have started to colonize this area including: sweet clover (*Melilotus alba*), various knapweeds, scotch broom and thistles. BES has actively controlled these highly invasive species with a combination of herbicide applications and mechanical removal. This effort has been very successful to date.

BES reseeded this component in fall 2007 with *Festuca rubra* v. commutata (chewings fescue) and *Festuca roemerii* (Roemer's fescue). BES will continue to monitor this area for species shift and invasive weed encroachment.

Irrigation System Status

Maintenance requirements for the irrigation system continue to be below less than the anticipated levels and associated costs. However, the battery operated controllers are not as reliable as the electrical equivalent, and additional funding may be necessary to replace the controllers in the spring of 2008. Irrigation system activities in 2007 include:

- Applying approximately 1/4" of irrigation water per hour for 2 hours per week for a total of 1/2" per week. During July, BES estimated up to 1/4" of water loss per day due to evapotranspiration.
- Repaired freeze damage, and added drain valves to prevent future damage in spring 2007.
- Annual inspection of entire system to identify, mark, and map any freeze or other types of damage.
- Drain and winterize system in fall 2007.

The irrigation system will be inspected in spring 2008 to replace any defective or worn battery operated controllers.

Attachment G

002688.OY28

2007 Surface Water, Inter-Armoring Water, and Sub-Armoring Water Assessment

McCormick & Baxter Creosoting Company Site Portland, Oregon

Task Order No. 71-03-28

May 2008

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
Northwest Region
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.

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List of Abbreviations and Acronyms

Acronym	Definition
bgs	below ground surface
BNRR	Burlington Northern Railroad
COCs	contaminants of concern
CPAHs	carcinogenic polynuclear aromatic hydrocarbons
DEQ	Oregon Department of Environmental Quality
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
FWDA	former waste disposal area
HPAHs	high molecular density polynuclear aromatic hydrocarbons
ID	identification
LPAHs	low molecular density polynuclear aromatic hydrocarbons
McCormick & Baxter	McCormick & Baxter Creosoting Company
MDL	method detection limit
MRL	method reporting limit
µg/L	micrograms per liter
mg/L	milligrams per liter
NAPL	nonaqueous phase liquid
ng/kg-wet	nanograms per kilogram-wet weight
OSU	Oregon State University
PAHs	polynuclear aromatic hydrocarbons
PCP	pentachlorophenol
QA	quality assurance
QC	quality control
RAs	remedial actions

SAP	Sampling and Analysis Plan
SIM	selective ion monitoring
Site	McCormick & Baxter Creosoting Company Site
STL	Severn Trent Laboratory
SVOCs	semivolatile organic compounds
TAT	TestAmerica Analytical Testing Corp.
TFA	tank farm area
TPAHs	total polynuclear aromatic hydrocarbons

1 Introduction

Ecology and Environment, Inc., (E & E) under contract with the Oregon Department of Environmental Quality (DEQ) has prepared this 2007 Surface Water, Inter-Armoring Water, and Sub-Armoring Water Assessment for the McCormick & Baxter Creosoting Company (McCormick & Baxter) site located in Portland, Oregon. This assessment summarizes the sampling activities and analytical results for the Spring 2007 and Fall 2007 surface water, inter-armoring, and sub-armoring water sampling events. Analytical results for water sampling events conducted in 2002, 2003, 2005, and 2006 are also included in this report in the form of figures and summary tables. The site, a former wood-treating facility, is located along the Willamette River at 6900 North Edgewater Street. These sampling events took place under Task Order 71-03-28.

The surface water, inter-armoring water, and sub-armoring water sampling objectives are described in the Draft O&M Plan (DEQ, 2007). Sampling is conducted for the site contaminants of concern (COCs). COCs include:

- Polynuclear Aromatic Hydrocarbons (PAHs);
- Pentachlorophenol (PCP); and
- Metals (arsenic, chromium, copper, and zinc).

Sampling activities for the Spring 2007 and Fall 2007 sampling events took place from: March 12, 2007 to March 16, 2007; and September 17, 2007 to September 21, 2007, respectively. During the Fall 2007 event, an additional sampling day, October 3, 2007, was required, as the water level during the week of September 17 was too low to allow collection of samples from certain locations.

Sampling activities are conducted in the fall and spring of each year (beginning in Fall 2005) to collect surface water and sub-armoring water (sand layer) samples for use in evaluating post-sediment cap construction water quality conditions under both low-river (fall) and high-river (spring) conditions. Beginning in 2006, a third sampling zone (inter-armoring water) was included for evaluation.

During the first post-sediment cap sampling event in Fall 2005, sampling terminology included surface water and pore water and/or transition zone water. The latter term has been replaced by sub-armoring water, which denotes samples collected from within the placed sand cap overlying the original sediments. In 2006, a third sampling interval was added. This interval was originally termed "flux chamber" after the design of the sampling equipment, which resembles a flux chamber sampling device. This interval has been renamed inter-armoring water, which denotes water samples collected from within the armoring overlying the sediment cap. The use of the term 'flux chamber' for denoting the sample was dropped because sample collection does not provide a measurement of flux (e.g., groundwater entering the river).

The Fall 2005 to 2007 sampling events were conducted in general accordance with the O& M Manual.

1.1 Report Organization

Following this introduction (Section 1), the sampling report is organized as follows:

- **Section 2, Sampling Methodology** This section presents specific sampling methodologies.
- **Section 3, Sampling Results** This section presents the sampling analytical program, summary of sampling results, and a statistical comparison of sampling results, including a summary of results from sampling conducted in 2002, 2003, and 2005 to 2007.
- **Section 4, Summary** This section presents a summary of the sediment cap monitoring activities to date and a discussion of planned sampling activities.
- **Section 5, References.**

Tables and figures are included in tabbed sections at the end of the text portion of the report.

The following appendices supplement the text and are included as electronic files on the attached CD:

- **Appendix A.** This appendix contains a photographic log of sampling activities during the Spring and Fall 2007 sampling events.
- **Appendix B.** This appendix contains a copy of the TestAmerica Analytical Testing Corp. certified laboratory analytical data, including

E & E data QA memoranda evaluating the laboratory data for the Spring 2007 sampling event.

- **Appendix C.** This appendix contains a copy of the TestAmerica Analytical Testing Corp. certified laboratory analytical data, including E & E data QA memoranda evaluating the laboratory data for the Fall 2007 sampling event.

- **Appendix D.** This appendix contains a DVD copy of the Global Diving Fall 2007 sampling video.

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2 Sampling Methodology

This section presents the sampling methodology employed during the Spring 2007 and Fall 2007 sampling events, a brief summary of the 2005 and 2006 sampling events and a discussion of deviations from the methodology. In general, surface water, inter-armoring and sub-armoring water samples collected during the most recent two sampling events used the methodologies described below.

2.2 Methodology

During the Spring 2007 and Fall 2007 sampling events, surface water, inter-armoring water, and sub-armoring water samples were collected from 22 collocated sampling locations. Sampling was conducted in accordance with the O&M Manual. The majority of these sampling locations were within the boundary of the sediment cap. Two surface water samples were collected outside of the sediment cap limits, one upriver and one downriver. Generally, sampling locations from the Spring 2007 and Fall 2007 events mirrored those of the Spring and Fall 2006 events and the Fall 2005 event. Details regarding the sampling methodology for the 2005 and 2006 sampling events can be found in the *Surface Water, Inter-Armoring Water, and Sub-Armoring Water Quality Assessment Report, March 2007* prepared by E & E.

Global Diving and Salvage, Inc, a diving subcontractor, assisted E & E in collecting water samples from deeper water locations in both the Spring 2007 and Fall 2007 events. During the Spring 2007 sampling event, all sample locations were collected with diver assistance. During the fall 2007 sampling event, divers assisted in collecting samples only in water deeper than 2 feet, while near-shore samples (less than 2 feet deep) were collected by E & E sampling team. Video of the diver assisted samples was collected and is available on DVD in Appendix D.

2.2.1 Surface Water Sampling

During the Spring 2007 and Fall 2007 sampling events, surface water samples were collected at 24 locations. Prior to the Spring 2007 sampling event, surface water samples in deep water were collected from a boat using a stainless steel bomb sampler.

Beginning with the Spring 2007 sampling event, methodology for surface water samples collected from depths greater than 5 feet was changed to address several concerns regarding volatilization of certain organic compounds, as well as to decrease the time needed to collect a sample. The new method utilizes a length of polyethylene tubing, a peristaltic pump, and a section of weighted rope. The tubing is secured approximately one foot above the bottom of the weighted rope, which is then slowly lowered to the bottom of the river. Once in place, the tubing is connected to a peristaltic pump used to purge the surface water and collect the sample. A new length of polyethylene tubing is used at each sampling location thus eliminating the need for decontamination and minimizing the possibility for cross contamination.

The peristaltic pump collection method reduces turbulence and/or aeration of the samples by eliminating pouring, as encountered while transferring the contents of the bomb sampler into the sample bottle. This minimizes the opportunity for certain organic compounds to volatilize during collection. As an added precaution, E & E sampling teams completely filled sample bottles, leaving no head space to further hinder volatilization. This method also reduced the amount of time required to collect a sample by creating an uninterrupted supply of water to fill the required sample bottles.

During the Fall 2007 sampling event, several surface water sample collection locations were submerged by less than 5 feet of water due to river levels. At these locations, E & E sampling teams did not use the peristaltic pump method, but rather submerged the sampling jar to approximately one foot from the river bottom before opening the lid and allowing the bottle to fill. As with the peristaltic pump method, sample containers were filled to the top to allow no head space.

2.2.2 Inter-Armoring Sampling

Beginning with the Spring 2006 sampling event, E & E collected inter-armoring water samples using a sampling device similar to the flux chamber sampling device used during previous sampling events. The purpose of this sampling was to collect water quality samples from the armoring layer, which represents a potential habitat for benthic organisms (e.g., crayfish).

During the Spring 2007 and Fall 2007 sampling events, inter-armoring sampling devices were deployed at 22 locations. Inter-armoring sampling devices are placed by divers in cases where water depth is greater than 5 feet. The inter-armoring sampling device is placed directly on top of the armor and then pushed down into the armor layer to allow collection of water from the pore spaces between the armoring of the sediment cap. The main 'chamber' is constructed of the bottom one-third of a 33-gallon plastic container. The chamber is attached by small diameter polyethylene tubing using a "quick connect" fitting to a peristaltic

sampling device is placed, a 2-inch diameter rubber stopper is pulled to allow air and surface water to pass through the chamber as it is pushed to the target depth. Once in place, the rubber stopper is reinserted prior to sampling. The purpose of the rubber stopper is to allow air and surface water to escape during placement of the sampling device. A peristaltic pump is used to purge the chamber for 1 minute at a low flow rate prior to collecting the sample. Field parameters are collected at the beginning and end of sample collection for each sample. Figure 2-1 shows a schematic of the inter-armoring sampling device. Inter-armoring samples are collected immediately following placement of the sampling device.

2.2.3 Sub-Armoring Sampling

Sub-armoring water samples were collocated with surface-water sample locations and inter-armoring sampling locations. The sub-armoring samples were collected from approximately 6-inches beneath the armoring layer within the sand layer of the sediment cap. Depending on site conditions (i.e., ability to remove armoring) sampling locations were modified in the field. A total of 25 and 24 sub-armoring water samples were collected in the Spring 2007 and Fall 2007 events, respectively. During the fall event, several near-shore samples were collected by E & E personnel, while samples at deeper locations were collected with the assistance of divers. In spring, during the high-water sampling event, all sub-armoring samples were collected with diver assistance.

Sub-armoring water sampling is conducted using an MHE push-point sampling tool with attached tubing. The PushPoint® mini-piezometer probes are developed and sold by MHE Products, and are commonly known as Henry Samplers. These probes are constructed of stainless steel, and are easily decontaminated, reusable, and have been used on similar sites throughout the country to obtain the same type of data. The probes are made of small-diameter, 316 stainless steel, and have a screened zone that consists of a series of interlaced machined slots which form a short-screened zone with approximately 20% open area. The probes are available in several different lengths ranging from 14 inches to 72 inches. The probe used in this sampling had an overall length of 36 inches and a screen length of approximately 1.5 inches. These devices are pushed into the sediment to the desired depth using a twisting motion. Then an internal guard rod is removed from the probe body, and tubing is attached to the end of the probe. In general, the desired depth is approximately 6-inches into the sand cap beneath the overlying armoring (rock or articulated concrete block [ACB]).

Once tubing is attached to the probe, it is purged using a battery-powered peristaltic pump. During purging, water quality parameters are monitored. Once specific conductance stabilizes, water is directed into sample containers.

A peristaltic pump is used to collect both inter-armoring and sub-armoring water samples for submittal to the subcontracted analytical laboratory. Purging and sampling is conducted at the lowest possible flow rate to reduce the potential for

inducing surface water into the sampling device. Following collection, samples are placed on ice and stored in a cooler for transport to the laboratory.

2.2.4 Water Quality Parameters

Water quality parameters are recorded in conjunction with the collection of each water sample. A YSI 556 Multi Parameter System with a flow–through cell and a LaMotte 2020e Turbidimeter were utilized to monitor surface water, inter-armoring water and sub-armoring water conditions during the 2007 sampling events. One set of parameters was recorded prior to collection of a surface water sample; three sets of parameters were recorded during the collection of each inter-armoring and sub-armoring sample. The first set of parameters was recorded immediately after pumping was initiated, and the second set of parameters was recorded after conditions stabilized and before the sample was collected (approximately 1 minute after the initial set during inter-armoring water sampling). The third set of parameters was recorded upon completion of the sample collection. Each set of parameters consisted of the following:

- Temperature,
- Dissolved Oxygen (DO),
- Oxidation Reduction Potential (ORP),
- Specific conductance (Conductivity),
- pH; and
- Turbidity.

2.3 Quality Assurance/Quality Control Sampling

During the Spring 2007 and Fall 2007events, E & E collected QA and Quality Control (QC) samples. QA/QC samples included the collection of Matrix Spike and Matrix Spike Duplicate (MS/MSD) samples for every group of 20 primary samples or fewer submitted to the laboratory for analysis. Blind duplicate samples were also collected at a rate of one duplicate for every group of 20 primary samples.

One equipment rinsate blank was collected for each type of sampling equipment used. The samples were collected at the end of each sampling event. Laboratory supplied de-ionized (DI) water was used as the water source of the samples. Rinsate samples were collected from the inter-armoring sampling device by pouring DI water into an inverted decontaminated inter-armoring sampling device. Sample bottles were filled by holding the uncapped bottles under the stream of water being discharged through the quick connect valve. The equipment rinsate blank for the Henry Sampler was collected by placing the screened end of the sampling device in a container of DI water and pumping into the sample jars using the peristaltic pump. These samples were collected in a manner consistent with other samples, in that no head space was left in the sampling containers and upon collection, sample containers were labeled, sealed in plastic bubble wrap bags,

and placed on ice in a cooler for transport to the contract laboratory by the laboratory courier.

2.4 Modifications to Methodology

Several deviations from the above methodology occurred during the Spring and Fall 2007 events. Most involved movement of the specified sample location. In the Spring 2007 and Fall 2007 event, location 20 was shifted approximately 10 feet to the southwest due to the presence of rip rap at the original location. During the Fall 2007 event, strong wind and river currents prevented the diving vessel from holding steady position at location 6. The boat was able to hold position long enough to collect a surface water sample, however, the inter-armoring and sub-armoring water samples were collected the next morning when the wind had subsided. In Fall 2007, sample location 18 was moved roughly 15 feet to the south as the original location was not under water during high tide. Similar relocations occurred at locations 17, (moved 35 feet southeast) 25, (moved 45 feet southwest - sub-armoring not moved) and 19, (moved 45 feet southwest). The sub-armoring water sample collected from location 3 during the Fall 2007 event, was collected one day after the surface water and inter-armoring water samples. Another variation to the methodology occurred at locations 25 and 26 where the rock armoring was too thick to completely penetrate, thus the sub-armoring sample was collected from the greatest depth that could be achieved with the equipment, which was still in the rock armoring layer rather than the underlying sand layer.

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3 Sampling Results

This section describes the analytical results for samples collected during the Spring 2007 and Fall 2007 sampling events. Section 3.1 provides a summary of analytical testing requirements for both sampling events. The following subsections provide sampling results for the Spring 2007 and Fall 2007 events, organized by sample type and constituent.

Analytical results for contaminants of concern (COCs) identified in the ROD (EPA 1996) for McCormick and Baxter were compared to the 1996 ROD AWQC's, the most recent (2007) EPA National Recommended Water Quality Criteria (NRWQC's) and the most recent EPA National Primary Drinking Water Regulations (NPDWR's). The following values are the lowest values for each COC from the above mentioned comparison criteria:

- Arsenic (III) – 0.00014 milligrams per liter (mg/L)
- Chromium (III) – 0.074 mg/L
- Copper – 0.009 mg/L
- Zinc – 0.110 mg/L
- Pentachlorophenol – 1 microgram per liter (µg/L)
- Acenaphthene – 520 µg/L
- Anthracene – 40,000 µg/L
- Fluoranthene – 54 µg/L
- Fluorene – 5,300 µg/L
- Naphthalene – 620 µg/L
- Pyrene – 4,000 µg/L
- Total Carcinogenic PAHs – 0.031 µg/L
- Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (k) fluoranthene, Chrysene, Dibenzo (a,h) anthracene and Ideno (1,2,3-cd) pyrene – 0.0018 µg/L, each.

Most of these values correspond to 2007 NRWQCs. The NRWQCs allow for site-specific calculations for criteria for Pentachlorophenol (based on pH) and for the metals chromium, copper and zinc (based on hardness). The NRWQC for pentachlorophenol was revised to reflect site pH, but the metals criteria have not been revised to reflect site-specific hardness. The NRWQCs based on carcinogenicity assume a risk level of 10^{-6}. The criteria listed above for zinc, acenaphthene, fluoranthene, naphthalene, and total Carcinogenic PAHs (CPAHs)

are based on AWQCs in place in 1996. The criteria listed above for pentachlorophenol represents the NPDWR maximum contaminant level (MCL). The criteria listed above for zinc is based on the AWQC in place in 1996. In 1996, AWQCs for metals were based on total metal concentrations at that time (as opposed to dissolved metal concentrations). The criteria listed above for arsenic, chromium, and copper are based on the NRWQCs in place in 2007, which were developed for dissolved metals. In summary tables in this report, field data for total metals are compared with NRWQCs for dissolved metals, as these are the comparison criteria currently available.

3.1 Sample Analysis

Upon collection, sample containers were labeled, sealed in plastic bubble wrap bags, and placed on ice in a cooler for transport to the contract laboratory by the laboratory courier. Analytical services were provided by TestAmerica Analytical Testing Corporation in Beaverton, Oregon (TAT). Formal chain-of-custody procedures were followed from sample collection to analysis.

Samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAHs), Pentachlorophenol (PCP), total and dissolved metals (arsenic, copper, chromium, and zinc), and total suspended solids (TSS) by the following methods;

- PAHs and PCP using EPA Method 8270 SIM (using ultra low-level detection limits);
- Total arsenic, copper, chromium, and zinc using EPA method 6020;
- Dissolved arsenic, copper, chromium, and zinc using EPA method 6020-diss; and
- TSS using APHA/EPA method 160.2.

Analytical summary tables for PAHs, PCP, TSS, total and dissolved metals for surface water, sub-armoring, and inter-armoring water samples from the Fall 2002 through Fall 2007 sampling events are summarized in Tables 3-1a through 3-1g. Data summary tables for 2002 and 2003 include only surface water results and have been included for comparison purposes only; they are not discussed below. Sample location maps for the 2002 and 2003 events are attached as Figures 3-1 and 3-2, respectively. Copies of the laboratory analytical reports and data review summary reports for Spring 2007 and Fall 2007 events are included as Appendices B and C, respectively, on the attached CD.

3.2 Analytical Results

Samples were collected from 22 locations in both the Spring and Fall 2007 events. However, during the Spring 2007 event, one extra sample from location 17 was

inadvertently collected and subsequently analyzed. This extra sample is not considered a duplicate as sampling equipment was removed and re-installed between samples. Results from both samples can be found in Table 3-1f. During the Fall 2007 event, an extra surface water sample from location 12 was collected due to breakage of bottles. Only the sample bottle containing water for PAH and PCP analysis was broken, the remaining sample, collected on September 17, 2007, was analyzed for total and dissolved metals as well as total suspended solids. The additional sample, collected on October 3, 2007, was only analyzed for PAH's and PCP. These results can be found in Table 3-1g.

During both the Fall and Spring 2007 events, two rinsate blanks were collected from decontaminated sampling equipment. The results of the Spring 2007 rinsate samples show detections of the following COC's:

- Dissolved Metals: chromium, copper, and zinc;
- Total Metals: chromium copper and zinc; and
- PAH's: naphthalene.

Detections in the Fall 2007 event include:

- Dissolved Metals: zinc;
- Total Metals: chromium and zinc; and
- PAH's: acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene.

Associated sample results less than five times the rinsate blank results were qualified as not detected (U). A total of 133 or approximately 6.6% of the results from the Spring 2007 event were qualified as not detected based on rinsate blank contamination. Of these, 75 were inter-armoring and 58 were sub-armoring. The Fall 2007 data had 142 results or approximately 7.8 % qualified as not detected based on rinsate blank contamination. Of the results qualified, 98 were sub-armoring, 41 were inter-armoring, and 3 were surface water. Rinsate blank contamination was also noted in samples from both the Spring and Fall 2006 events. However, data for field samples from 2006 was not adjusted to reflect detections in the rinsate blank.

To evaluate potential sources of contamination detected in the field rinsate blank, E & E collected additional samples, summarized in Table 3-1h. To determine whether the rinsate blank contamination resulted from the laboratory-supplied de-ionized (DI) water utilized to collect the rinsate sample, E & E collected a sample of the DI water in December 2007 for laboratory analysis. The results for that sample showed the presence of PAHs (acenaphthene, anthracene, fluorine, naphthalene, and phenanthrene) at concentrations ranging from 0.101 to 2.14 ug/L. Metals were not detected (the MRL was 0.001 mg/L). The DI water was stored in the field garage at the site, and although the container had not been

opened prior to sampling, it appears that PAHs permeated the container and were present in the water used for the field rinsate blanks.

The fall 2007 surface water duplicate collected at location 7 raised concern that the tubing, also stored in the site garage, used to collect some of the samples had become contaminated with PAHs during storage at the site. There were no PAHs detected in the surface water duplicate while the initial sample contained 1.47 ug/L total PAHs. These PAH concentrations are consistent with the contamination of the DI water. The duplicate sample is collected directly after the sample using the same tubing. Thus, the purging of the tubing by surface water during sampling may have desorbed the PAH contamination from the tubing. To determine whether tubing may potentially have impacted sample results, E & E collected a sample of water that was pumped through tubing that had been stored in the site garage. For this sample, E & E obtained certified Ultra Pure Blank Water from an outside supplier (ESS) and collected two samples: one sample of water pumped through tubing (MB-TB) and one water sample poured directly into the sample containers (MB-RS), to verify the purity of the water provided. As shown in Table 3-1h, two PAHs were detected in the sample collected from tubing (acenaphthene at 0.0142 ug/L and naphthalene at 0.0517 ug/L) while none were detected in the RS water sample. The metals chromium, copper and zinc were detected in the tubing sample, while chromium and zinc were detected in the Ultra Pure water sample. It appears that PAHs may indeed have sorbed to the interior surfaces of the tubing during storage at site, and were subsequently introduced to samples during pumping through tubing. Concentrations detected in the sample from tubing were approximately one order of magnitude less than the concentrations detected in the DI water sampled in December. Concentrations of PAHs detected in the rinsate blanks and subsequent rinsate samples collected in 2007 were all orders of magnitude below the comparison criteria.

Metals were detected in the tubing sample; however, they were also detected in the sample of the water. This could be due to the presence of metals in the water that was provided, or possibly could have been introduced during the pouring of water into sample containers (via dust particulates in the ambient air). These rinsate samples were collected in the parking area outside of the site garage. The metals concentrations were very low (1 ug/L or lower) in both samples and did not exceed the comparison criteria. The metal that most frequently exceeds comparison criteria in water samples from the site, arsenic, was not detected in the rinsate samples.

In addition, most of the locations from fall 2007 that had PAH detections in surface water had no PAHs detected in the inter-armoring water. Thus, it is suspected that the PAHs detected in surface water in the fall 2007 are either not associated with the site or due to contaminated field equipment (tubing). There is no record of where new tubing was used versus tubing stored in the field garage, thus no way to assess which samples may have been contaminated from the

tubing. In the future, no sampling equipment will be stored in the field garage or other location onsite where it could come into contact with contamination.

Sampling results from the Spring 2007 and Fall 2007 sampling events are discussed below. Total carcinogenic PAH (CPAH) results for each sampling event are shown in Figures 3-3 through 3-5; Naphthalene results for each sampling event are shown in Figures 3-6 through 3-8; and copper results for each event are shown in Figures 3-9 through 3-11. It should be noted that figures included in this report differ slightly from those in the 2006 report. The sample locations plotted in the previous report represent the proposed sample locations. The figures in this report represent the actual locations where each sample was collected. The differences between the locations are minor.

3.2.1 Surface Water Sampling Results

During the Spring 2007 event, 26 surface water samples were collected from 24 locations including one duplicate (MBSW0307-42 from location 12) and two samples from location 17. Of these samples, all had detectable concentrations of at least one total and dissolved metal, two had detectable concentrations of PAHs, and none of the 26 samples had PCP detected. During the Fall 2007 event, 26 surface water samples were collected from 24 locations including one duplicate (MBSW0907-61 from location 7) and two samples from location 12 (due to breakage). Of these samples, all had detectable concentrations of dissolved metals:, 24 samples had detectable concentrations of total metals, 17 samples had detectable PAH's and none of the samples had detections of PCP. Both the upstream and downstream control samples had low level detections of PAHs. As described above, it is suspected that the low level detections in surface water are the result of contaminated equipment usage in sampling. Analytical results for surface water samples are summarized in Tables 3-1a through 3-1g, and are discussed below. Total CPAH results for surface water samples are shown in Figure 3-3.

PAH Results

In the Spring 2007 event, there were no detectable CPAH concentrations reported. Two of the samples collected had measurable concentrations of non-carcinogenic PAHs. For location 27, the downriver background, results showed a concentration of 0.0189 µg/L of naphthalene, while location 19, located near the TFA, had a fluoranthene concentration of 0.0133 µg/L.

In Fall 2007, there were no detectable CPAH concentrations reported. The highest TPAH results occurred at location 17 near the TFA, with a concentration of 1.99 µg/L. Naphthalene was the largest PAH constituent, contributing 1.23 µg/L to the total. Figure 3-6 shows the spatial distribution of naphthalene detected in surface water samples.

PCP Results

PCP was not detected above the method detection limits in any of the surface water samples collected during the Spring 2007 or Fall 2007 sampling events. The MDL for PCP ranged from 0.237 to 0.250 µg/L.

Total Metals

Total metals analysis was conducted for arsenic, chromium, copper, and zinc. In Spring 2007, arsenic and copper were the most commonly detected metals and were reported in all 26 surface water samples. In Fall 2007, copper was the most commonly detected metal and was found in 22 of 25 surface water samples.

Arsenic concentrations ranged from .00017 milligrams per liter (mg/L) to a maximum of 0.00041 mg/L at Location 6 in Spring 2007. In Fall 2007, arsenic concentrations ranged from below MDL to a high of 0.00143 mg/L at Location 17. All reported arsenic concentrations in 2007 exceeded the corresponding comparison criteria of 0.00014 mg/L.

In Spring 2007, chromium concentrations ranged from below MDL to a high of 0.00165 mg/L at Location 26 located in the TFA. In Fall 2007, concentrations ranged from below MDL to a high of 0.000825 mg/L from Location 10, located under the railroad bridge. Reported chromium concentrations in 2007 did not exceed the corresponding comparison criteria of 0.074 mg/L.

Copper concentrations ranged below MDL to a maximum concentration of 0.00315 mg/L and 0.00223 mg/L in Spring 2007 and Fall 2007, respectively. In Spring 2007, total copper was detected in all 26 surface water samples. Reported copper concentrations in 2007 did not exceed the corresponding comparison criteria of 0.009 mg/L. Total copper results for surface water are shown in Figure 3-9.

Zinc concentrations ranged from below MDL to a maximum concentration of 0.0216 mg/L and 0.00445 mg/L in Spring 2007 and Fall 2007, respectively. Reported zinc concentrations in 2007 did not exceed the corresponding comparison criteria of 0.11 mg/L.

Dissolved Metals

In Spring 2007, dissolved metals were detected in 100 percent of the samples for both chromium and copper. Zinc and arsenic were detected in 21 and 22 samples, respectively. The highest concentrations reported were 0.0225 mg/L (location 8) and 0.00182 mg/L (location 15) for zinc and copper, respectively. In Fall 2007, dissolved metals were detected in all surface water samples collected. The most frequent detections were copper and zinc, occurring in 24 and 16 samples, respectively.

The metals detected in water samples are naturally occurring in soil and sediment. It was noted that samples containing higher concentrations of total metals corresponded with locations where higher levels of TSS were detected. For example, in Fall 2007, the sample with the highest copper concentration corresponded with the highest TSS concentration (location 25). This would be expected, as entrained sediment captured in the process of collecting water samples would contain these metals.

3.2.2 Inter-Armoring Water Sampling Results

During the Spring 2007 sampling event, 24 inter-armoring water samples were collected from 22 locations including one duplicate sample (MBIA0307-29 from location 19) and two samples from location 17. In general, all samples had detectable concentrations of both dissolved and total metals, four of the 24 samples had detectable amounts of PAHs (none carcinogenic), and none of the samples had detectable levels of PCP. During the Fall 2007 sampling event, 23 inter-armoring water samples were collected from 22 locations including one duplicate sample (MBIA0907-64 from location 26). Of the 23 samples, 22 had detections of dissolved metals, 19 had detections of total metals, 8 had detections of PAH's and there were no detections of PCP. Analytical results for inter-armoring samples are summarized in Tables 3-1d through 3-1g and are discussed below. Total CPAH results for inter-armoring water samples are shown in Figure 3-4.

PAH Results

Analytical results from the Spring 2007 sampling event showed that none of the inter-armoring water samples had detectable concentrations of CPAHs. Four inter-armoring water samples had detections of non-CPAHs. Acenaphthene was the most commonly detected PAH constituent, occurring in 3 of 4 samples with detectable PAHs. Total PAH concentrations ranged from below MDLs to a maximum concentration of 0.1495 µg/L. MRLs ranged from 0.1106 µg/L to 0.10285 µg/L. The maximum total PAH concentration was detected at Location 20 under the BNRR bridge. The next highest total PAH concentration was reported from the sample collected at Location 5 (TFA), at 0.0992 µg/L. No sample from the Spring 2007 sampling event exceeded the corresponding comparison criteria of 0.031 µg/L for total CPAHs. During the Fall 2007 sampling event, there were no CPAH's detected in inter-armoring water samples. Eight samples collected in the Fall 2007 event had detections of TPAH's. The highest TPAH concentration was detected at location 17 with 0.0812 µg/L. Naphthalene results for inter-armoring water samples are shown in Figure 3-7.

PCP Results

During the Spring 2007 and Fall 2007 sampling events, PCP was not detected above the MDL in any of the samples collected. The MDL ranged from 0.238 to 0.250 µg/L.

Total Metals

Inter-armoring samples were analyzed for total arsenic, chromium, copper, and zinc. In spring 2007, both arsenic and copper were the most commonly detected metals and were reported in all 22 inter-armoring samples. In Fall 2007, both arsenic and copper were the most commonly detected metals and were detected in 17 and 19 of the samples collected, respectively.

Arsenic concentrations ranged from .00017 milligrams per liter (mg/L) to a maximum of 0.00713 mg/L at Location 5 in Spring 2007. In Fall 2007, arsenic concentrations ranged from below MDL to a high of 0.00202 mg/L at Location 13 located in Willamette Cove. All reported arsenic concentrations exceeded the comparison criteria of .000014 mg/L

Chromium was detected in approximately 64 percent of the samples collected during the Spring 2007 sampling event at concentrations ranging from below MRL to a maximum concentration of 0.0227 mg/L at Location 5, in the TFA. During the Fall 2007 sampling event, chromium was detected in 52 percent of the samples collected, and ranged in concentration from below MDL to 0.00456 mg/L at Location 16. Reported chromium concentrations did not exceed the corresponding comparison criteria of 0.074 mg/L.

Copper was detected at all 22 sampling locations during the Spring 2007 sampling event at concentrations ranging from 0.00119 mg/L to a maximum concentration of 0.037 mg/L at Location 5 in the TFA. During the Fall 2007 sampling event, copper was detected in 82 percent of the samples collected, and ranged in concentration from below detection limits to a maximum of 0.00858 mg/L at Location 16. Sample results from locations; 4, 5, 6, and 21 event exceeded the comparison criteria of 0.009 mg/L during the Spring 2007 event. It should be noted that TSS in all four of these samples exceeded 95 mg/L. Total copper results for inter-armoring water samples are shown in Figure 3-10.

Zinc was detected in approximately 60 percent of the samples collected during the Spring 2007 sampling event at concentrations ranging from below MDL to a maximum concentration of 0.0665 mg/L at Location 5 near the TFA. During the Fall 2007 sampling event, zinc was detected in 60 percent of the samples collected and ranged in concentration from below MDL to 0.0222 mg/L at Location 16. Reported zinc concentrations did not exceed the corresponding comparison criteria of 0.11 mg/L.

Dissolved Metals

During the Spring 2007 sampling event, chromium and copper were the most commonly detected dissolved metals, occurring in 100 percent of the 24 inter-armoring water samples collected. Arsenic and zinc were detected in 22 and 20 samples, respectively. The highest concentration of any dissolved metal was

detected at location 18 near the FWDA with a zinc concentration of 0.00712 mg/L. During the Fall 2007 event, copper was the most commonly detected dissolved metal, occurring in 22 of 23 inter-armoring water samples collected. Dissolved chromium was not detected in any of the inter-armoring water samples collected during the Fall 2007 event. The highest concentration of any dissolved metal in the Fall 2007 event, occurred at location 26 with a zinc concentration of 0.00775 mg/L. Location 26 also had the highest concentration of dissolved chromium (0.00662 mg/L).

As noted above for the surface water samples, higher total metals concentrations often coincide with higher TSS concentrations. Inter-armor samples are collected from pore water between interstitial spaces in rock armoring; samples from this interval typically have higher TSS concentrations than from surface water samples.

3.2.3 Sub-Armoring Water Sampling Results

In the Spring 2007 sampling event, 25 sub-armoring water samples were collected from 22 locations including two duplicate samples (MBSA0307-28 at location 9; MBSA0307-35 at location 26) and two samples collected at location 17. Of these samples, all had detectable concentrations of total and dissolved metals, 3 had detectable concentrations of CPAHs and none had concentrations of PCP above the MDL.

In the Fall 2007 sampling event, 24 samples were collected from 22 locations including two duplicate samples (MBSA0907-62 at location 2; MBSA0907-60 at location 12). Of the 24 samples, dissolved metals were detected at each location, total metals detected at 21 locations, CPAH's were detected at 4 locations and PCP was detected at one location. Analytical results for sub-armoring water samples are summarized in Tables 3-1c through 3-1g, and are discussed below. Total CPAH results for sub-armoring samples are shown in Figure 3-5.

PAH Results

In Spring 2007, detectable CPAH concentrations were reported in approximately 14 percent of the sub-armoring samples collected. Total CPAH concentrations in Spring 2007 ranged from below MDL to 0.0994 µg/L at Location 10, located beneath the Burlington Northern Railroad (BNRR) bridge. The next highest total CPAH concentration reported in Spring 2007 was from Location 7 at 0.0775 µg/L, outside of the embayment area. In all, three locations with detectable concentrations of CPAHs (7, 10, 13), exceeded the total CPAH comparison criteria of 0.031 µg/L. The most commonly detected CPAH constituent was chrysene, detected in 100 percent of the samples with detectable concentrations. The highest chrysene concentration was reported at Location 7 with 0.359 µg/L. In the Fall 2007 sampling event, detectable CPAH concentrations were reported in 4 of the 24 sub-armoring water samples collected (Locations 3, 7, 9 and 10). Locations 7 and 10 exceeded the comparison criteria of 0.031 µg/L for CPAHs

with concentrations of 0.1658 µg/L and 0.0867, respectively. The most commonly reported CPAH constituent was chrysene, occurring in all four samples with detectable CPAHs. Location 16 had the highest TPAH result for the Fall 2007 event, with a concentration of 445.89 µg/L. Naphthalene accounted for 407 µg/L of the total. Figure 3-8 shows the results for naphthalene concentrations in sub-armoring water samples.

PCP Results

During the Spring 2007 sampling event, PCP was not detected above the MDL in any of the samples collected. In Fall 2007, PCP was detected in one sample, at 3.27 µg/L, collected at location 16. This result exceeds the comparison criteria for PCP of 1 µg/L. This sample also exhibited the highest naphthalene concentrations of any water sample collected during the Fall 2007 event.

Total Metals

Sub-armoring samples were analyzed for total arsenic, chromium, copper, and zinc. Arsenic was the most commonly detected metal in sub-armoring samples and was reported in 100 percent of the samples collected during the Spring 2007 sampling event. Arsenic was reported in approximately 100 percent of the samples collected during the Fall 2007 sampling event. The next most common detection was copper, reported in approximately 95 percent of the samples collected in Spring 2007. Copper was reported in 96 percent of the samples collected in Fall 2007.

In Spring 2007, arsenic was reported above the MDL in all samples and at a maximum concentration of 0.0522 mg/L at Location 3 in the TFA. During the Fall 2007 sampling event, arsenic concentrations ranged from below MDL to a maximum of 0.0322 mg/L at Location 4. All of the reported arsenic concentrations exceeded the corresponding comparison criteria of 0.00014 mg/L.

Chromium was detected in approximately 55 percent of the samples collected during the Spring 2007 sampling event at concentrations ranging from below MDL to a maximum concentration of 0.00255 mg/L at Locations 15 and 20 in the FWDA and under the BNRR bridge, respectively. During the Fall 2007 sampling event, chromium was detected in 8 percent of the samples collected, and ranged in concentration from below MDL to 0.00143 mg/L at Location 3 in the TFA. Reported chromium concentrations did not exceed the corresponding comparison criteria of 0.074 mg/L.

Copper was detected at all 21 of 22 sampling locations during the Spring 2007 sampling event at concentrations ranging from below MDL to a maximum concentration of 0.544 mg/L at Location 15 in the FWDA. During the Fall 2007 sampling event, copper was detected in 88 percent of the samples collected, and ranged in concentration from below MDL to a maximum of 0.00476 mg/L at

Location 15 near the FWDA. Sample results from locations 12 and 15 during the Spring 2007 event exceeded the comparison criteria of 0.009 mg/L. None of the Fall 2007 results were in exceedance. Total copper results from sub-armoring water samples are shown in Figure 3-11.

Zinc was detected in approximately 56 percent of the samples collected during the Spring 2007 sampling event at concentrations ranging from below MDL to a maximum concentration of 0.0526 mg/L at Location 15 near the FWDA. During the Fall 2007 sampling event, zinc was detected in 88 percent of the samples collected and ranged in concentration from below MDL to 0.0335 mg/L at Location 16. Reported zinc concentrations did not exceed the corresponding comparison criteria of 0.11 mg/L.

Dissolved Metals

Chromium and copper were the most commonly detected dissolved metals in sub-armoring water samples collected during the Spring 2007 event, occurring in 100 percent of the samples. Arsenic and zinc were detected in 23 and 22 samples, respectively. The highest concentration of a dissolved metal occurred at location 3, with arsenic detected at 0.0527 mg/L. In Fall 2007, dissolved arsenic was the most commonly detected, occurring in 23 samples. Chromium and zinc were detected in 11 and 16 samples, respectively. The highest dissolved metal concentration occurred at location 4, with arsenic detected at 0.0354 mg/L.

3.3 Water Quality Parameters

Parameters including; temperature, specific conductance, DO, OPR, pH and turbidity were reviewed to identify any correlations between sample types and locations. Water quality parameters were recorded during the collection of each sample. Generally, water temperatures in the Fall 2007 event were approximately 10 degrees warmer than those collected in the Spring 2007 event. Water temperature did not vary greatly between sample types (surface water, inter-armoring water, and sub-armoring water). In both Spring and Fall 2007 events, values for specific conductance were similar between surface water and inter-armoring water samples; however, sub-armoring samples tended to be an order of magnitude higher than the surface water and inter-armoring water values from the same location. Dissolved oxygen, also, exhibited a difference between sub-armoring water and surface/inter-armoring water. Dissolved oxygen in sub-armoring water samples was typically much lower than surface water and inter-armoring water. Typical DO values for sub-armoring water range from 0.5 mg/L to 2.0 mg/L. Similar to DO and specific conductance, pH also exhibits similar values when comparing co-located surface water and inter-armoring water against sub-armoring water. The sub-armoring water typically has a pH which is 1 to 2 pH units lower than that of the corresponding surface water/inter-armoring water. In general, water quality parameters collected from collocated surface water and inter-armoring water were essentially identical, whereas sub-armoring water

exhibits different characteristics than that of water from overlying rock armor or surface water.

Turbidity and TSS are commonly higher in the inter-armoring sample than either the surface water or sub-armoring sample. For instance, Spring 2007 Location 4 had a TSS of 265 mg/L (NTU of 50) while the surface water was 7 mg/L (NTU of 9) and the sub-armoring sample was 66 mg/L (NTU of 2.3). The total metals concentrations from the inter-armoring sample reflects the higher turbidity with a copper concentration of 0.0107 mg/L which as order of magnitude higher than the surface water or sub-armoring sample. PAHs do not appear to increase with the increase in turbidity, suggesting that the PAHs are not associated with the particulate matter but, where present in the inter-armoring, dissolved in water.

3.4 Data Review and Statistical Analysis

All data presented in this report has been thoroughly reviewed by an E & E chemist to determine data quality and usability. In this review, the following criteria are evaluated:

- Sample receipt temperatures,
- Holding times,
- Method blank samples,
- Matrix spike samples,
- Laboratory control samples,
- Duplicate samples,
- Surrogate spike recoveries, and
- Rinsate blank samples.

Conclusions and recommendations pertaining to the overall usefulness of the data are summarized in the attached 'E & E Data QA Memoranda', located in Appendices B and C. All data reviewed for this report was deemed useable with some qualifications.

Data collected during the Spring and Fall 2007 sampling events has been summarized through a series of statistical analyses. Data has been tabulated by sampling event and media (surface water, inter-armoring water or sub-armoring water). Results for PAHs were totalized into four types; Total low molecular weight PAHs (LPAHs), total high molecular weight PAHs (HPAHs), total CPAHs and total PAHs. Any samples which resulted in all PAH constituents below detectable limits, were totalized by adding one half of the MDL for each constituent being summed. If a sample resulted in detectable concentrations for any PAH constituent, only the detections were summed for that total.

3.4.1 Statistical Parameters

A series of statistical parameters were used to summarize the data and were provided for each media (i.e., surface water, inter-armoring water, and sub-armoring water) and each sampling event (i.e., Fall 2002, Fall 2003, Fall 2005, Spring 2006, Fall 2006, Spring 2007, and Fall 2007). The parameters include the following:

- Number of Samples;
- Detection Frequency;
- Maximum Detected Concentration;
- Location of Maximum;
- Mean Concentration;
- Data Distribution; and
- 95% Upper Confidence Limit on the Mean (95% UCL).

The summary statistics for each sampling event are provided in Tables 3-1a through 3-1g. The methodology used to calculate these statistics are provided in this section. Background or reference samples (upstream and downstream samples collected outside the cap footprint) were not included in the statistical analysis.

The number of samples, detection frequency, maximum detected concentration, and location of maximum were calculated by standard means using Microsoft Excel functions. Duplicate results were not included in the calculation of number of samples or detection frequency. In the summary tables, if an analyte was not detected in any sample for the media and year combination, the detection frequency was shown as 0%, the maximum detected concentration was indicated as ND (not detected), and the location of maximum concentration was indicated NA (not applicable).

To calculate the mean concentration, data distribution and 95% UCL, additional processing of the data was necessary. One-half the detection limit was used as the sample concentration for non-detected analytes. The maximum detected concentration or maximum detection limit for non-detected results between a duplicate sample and original were used to calculate the statistical parameters.

To calculate the distribution of the data and the 95% UCL, EPA's ProUCL Version 3.00.02 was used. Non-detects and duplicates were treated as mentioned above. Within ProUCL, the UCL for each analyte was calculated for all UCL types at the 0.95 confidence coefficient. The number of bootstrap runs was set to the default of 2000. The ProUCL output includes raw statistics (mean, maximum, standard deviation, etc.), results of each distribution test, and recommendations for distribution and 95% UCL. The method for calculating data distribution and 95% UCL and for determining the recommended values is presented in EPA 2004. If the recommended 95% UCL exceeded the maximum concentration, the

maximum detected concentration was used as the 95% UCL, and the distribution was set to "max."

Summary tables and graphs were developed to show results from multiple sampling events. Tables 3-2 through 3-4 summarize the statistical results from all sampling events for surface water, inter-armoring water, and sub-armoring water. The mean for sampling events from 2005 through 2007 for total arsenic, total copper, and cPAHs are presented in Figures 3-12, 3-13, and 3-14, respectively. Each graph shows data from surface water, inter-armoring water, and sub-armoring water samples.

Data is also graphically depicted for selected sample locations to show changes in contaminant concentrations over time, from 2005 through 2007. Figures 3-15 through 3-17 show total arsenic and copper concentrations for samples collected from Locations 10, 12, and 4, respectively. Figures 3-18 through 3-20 show cPAH concentrations for Locations 10, 12, and 4, respectively.

The number of significant figures presented in all tables does not reflect the true accuracy presented by the laboratory results. Data should only be retained to three significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may appear in the tables.

3.4.2 Comparison of Statistical Results

The mean concentration and 95 percent UCL were compared over time to evaluate overall contaminant concentration trends. In surface water, the mean concentrations for total metals (As, Cr, Cu, and Zn) remained relatively stable between Fall 2002 and Fall 2007. Pentachlorophenol was detected in surface water during the 2002 sampling event but has not been detected in subsequent sampling events. Total PAHs have remained relatively stable from 2005 through 2007 sampling events, at mean concentrations well below the mean detected in 2002. Mean and 95% UCL Total PAH concentrations were higher during the fall sampling events than the spring events in 2006 and 2007. River levels are lower during the fall time periods. Carcinogenic PAHs have not been detected since the Spring 2006 sampling event.

A significant influence on the surface water data came from a single sample (SED 6) collected during the 2002 sampling event. Sample SED 6 contained 61.5 ug/L total PAHs. This result significantly skewed the data set. When SED 6 was removed from the data set, the mean and 95 percent UCL varied less than 0.2 ug/L from the remaining data sets. Statistical data sets for surface water are summarized in Table 3-2. For 2002, data sets are presented with and without SED 6 data.

Inter-armoring water samples were collected in 2006 and 2007, as shown in Table 3-3. Mean metals concentrations have been relatively stable. Pentachlorophenol

was detected in Fall 2006 but not during the other sampling events. Mean concentrations for Total PAHs have decreased each sampling event from 0.627 ug/L to 0.047 ug/L. The 95% UCL values for Total PAHs were lower in 2007 than in 2006 by more than one order of magnitude. Total CPAHs were detected in 2006 but not in 2007.

For sub-armoring water samples, shown in Table 3-4, metals concentrations were relatively stable, although mean chromium concentrations were higher in Spring 2007 than other sampling events. Pentachlorophenol and PAH concentrations were also relatively stable over time.

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4 Summary

Five sampling events have been conducted since the installation of the sediment cap at the McCormick and Baxter site: Fall 2005, Spring 2006, Fall 2006, Spring 2007 and Fall 2007. During each event, samples were collected from surface water and sub-armoring water. Beginning with the Spring 2006 event, collection of inter-armoring water was added. Sampling conducted in 2002 and 2003 represents pre-sediment cap conditions and did not include inter-armoring or sub-armoring sampling. Sampling activities were conducted in general accordance with the *2005 Surface Water and Transition-Zone Water Sampling and Analysis Plan,* and *Spring 2006 Transition-Zone, Surface Water and Flux-Chamber Sampling and Analysis Plan.* both prepared by E & E. Depending on field conditions, samples were collected from 22 to 23 sampling locations across the sediment cap by either E & E personnel, E & E personnel with diver assistance, or by OSU personnel[1].

4.1 Sample Comparison

Samples were generally analyzed for site COCs, including both total and dissolved metals (arsenic, chromium, copper, and zinc), PAHs, and PCP. Sample analysis was provided by TAT, (formerly North Creek Analytical, Inc.) under separate contract with DEQ. Analytical results were compared against a group of water quality guidelines including AWQCs established in the 1996 ROD, NRWQCs and NPDWRs, established by EPA.. These guidelines are collectively referred to as comparison criteria. Of the site COCs, comparison criteria have been developed for total metals, PCP, acenaphthene, anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) flouranthene, Benzo (k) fluoranthene, Chrysene, Dibenzo (a,h) anthracene, chrysene, fluoranthene, fluorene, Ideno (1,2,3-cd) pyrene, naphthalene, pyrene, and total CPAHs.

Based on maximum detected concentrations in surface water for select analytes, there is a decreasing trend in contaminant concentrations for total PAHs, CPAHs, and naphthalene since the 2002 sampling event. However, maximum concentrations for these analytes have remained relatively constant since the 2003 sampling event. For example, the maximum total PAH concentration in 2002 was

[1] OSU personnel only participated in the Fall 2005 sampling event.

61.5 µg/L. The next highest maximum detection was reported from the Fall 2007 sampling event at 1.990 µg/L. Maximum concentrations for metals in surface water have also remained relatively constant since the 2002 sampling event.

Maximum detected concentrations for total metals in inter-armoring water samples show a slight increase from the 2006 events to the 2007 events; however, PAHs and PCP in inter-armoring water samples have declined since the 2006 events. Additionally, metals samples collected in the spring events tend to have higher concentrations than those collected in the fall events.

Maximum detected concentrations in sub-armoring water samples do not show a discernable trend. Maximum detections are summarized for select analytes in Table 4-2.

A comparison of total PAH detection frequency in surface water between all sampling events (2002 through 2007), shows a higher overall detection frequency during pre-remedy implementation sampling events. The frequency of total PAH detections in 2002 and 2003 were 60 percent and 43 percent, respectively. Total PAH detect frequencies in Fall 2005, Spring 2006, Fall 2006, Spring 2007 and Fall 2007 were 19 percent, 30 percent, 23 percent, 8 percent and 68 percent, respectively. The high total PAH detection frequency during the Fall 2007 event is anomalous when compared to previous events and it should be noted that only three of the surface water samples collected in the Fall 2007 event had concentrations exceeding 1.0 µg/L. In addition, most of the locations where PAHs were detected in surface water, no (or lower concentrations) PAHs were detected in the associated inter-armoring sample suggesting that the surface water contamination is either not associated with the site, as suggested by the presence of PAHs in the upriver Sample (location 1) during the Fall 2007 event, or perhaps as suggested by the discrepancy in the duplicate sample results, related to contaminated field equipment. Elevated detection frequency from the 2002 and 2003 events was anticipated as no barriers (sediment cap, barrier wall, or impermeable upland cap) were in place during the first two sampling events, and suggests the sediment cap is limiting contaminant migration to surface water.

Detection frequencies increase with depth. Surface water detection from Fall 2005 through 2006 ranged from 19 to 68 percent, while sub-armoring water detections ranged from 78 to 91 percent. Detection frequencies for total metals were generally much higher than PAHs; however, no discernable pattern was observed between sampling events. Total PAH and metals detection frequencies are summarized in Table 4-3.

The primary hydraulic differences between fall and spring sampling events are higher river levels and flow during the spring sampling. During the Spring 2007 sampling event, river elevations ranged from between 9 and 13 feet NAVD88.

During the Fall 2006 sampling event, elevations[2] ranged between 4 and 9 feet NAVD88. Willamette River elevation data for each sampling event (2002 through 2007) are presented in Figures 4-1a through 4-1g. During the Spring 2007 event, river discharge averaged roughly 50,000 cubic feet per second (cfs), while discharge rates during the Fall 2007 sampling event were considerably lower, averaging about 11,000 cfs. Additionally, discharge rates and stream velocities were often negative on a daily basis, resulting in reverse flow and potentially more stagnant conditions during fall sampling events. Discharge data for the Willamette River are presented in Figures 4-2a through 4-2g, and stream velocity data are presented in Figures 4-3a through 4-3g.

[2] Stream elevation, velocity, and discharge measured on Willamette River at the Morrison Bridge, Portland, OR (USGS Site ID 14211720)

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Figures

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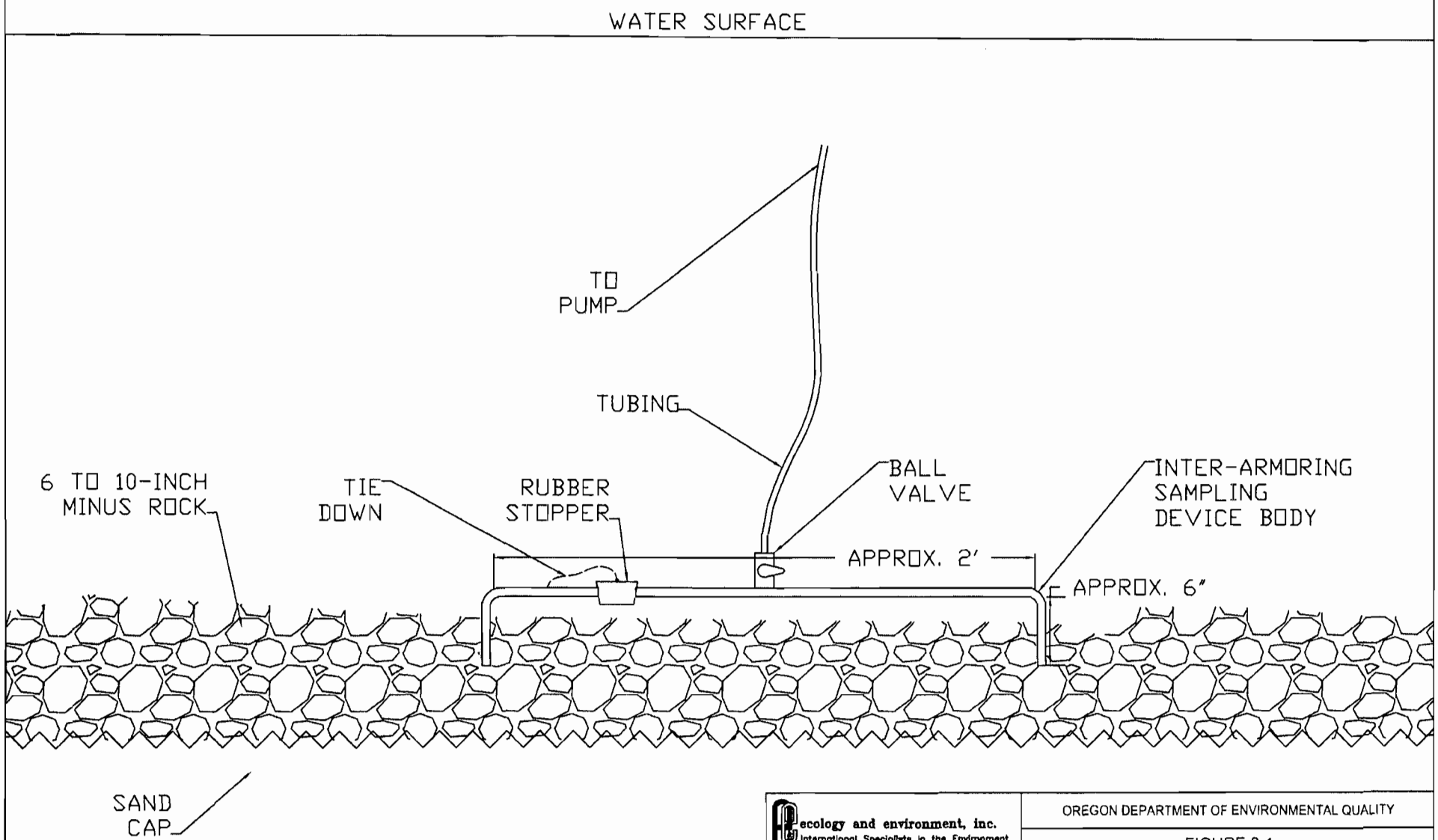

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International Specialists in the Environment
Portland, Oregon

DESIGNED BY: B. CIECKO

CHECKED BY:

DRAWN BY: B. CIECKO

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

FIGURE 2-1
INTER-ARMORING SAMPLING DEVICE
McCORMICK & BAXTER
CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	PROJECT NO.
NTS	01/22/2007	002688.0Y28.04

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N W E S
0 50 100 200 300 400 500 600
Feet

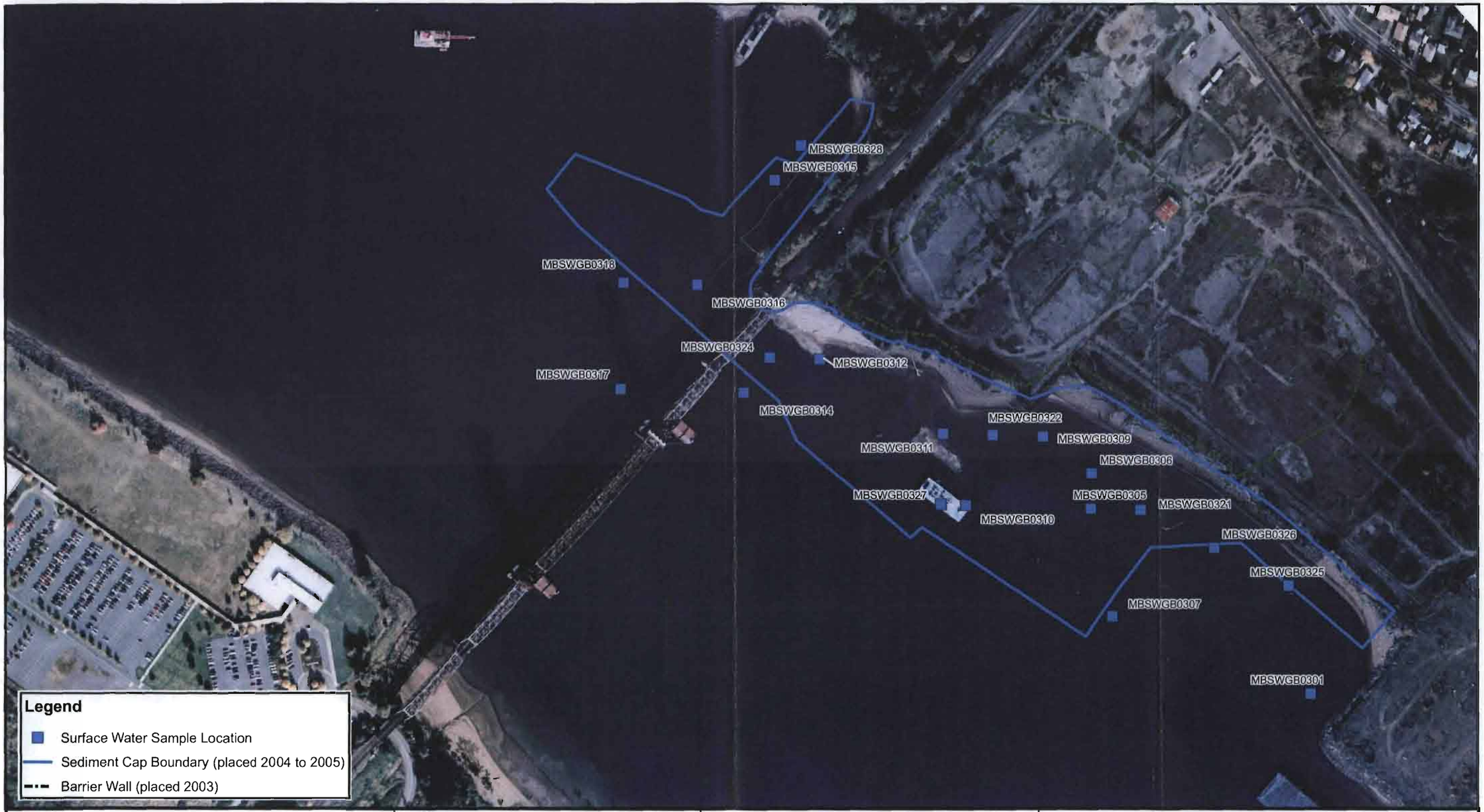
SPMD Sample Locations from OSU Report
Aerial Photo: EPA Region 10 - 2002

McCORMICK AND BAXTER
CREOSOTING COMPANY SITE
Portland, Oregon

Figure 3-1
Sample Location Map
Fall 2002 Sampling Event

Date:	Drawn by:	Job number:
01/30/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-1 fall 2002 samp loc map.mxd



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N W E S

0 75 150 300 450 600
Feet

Aerial Photo: EPA Region 10 - 2002

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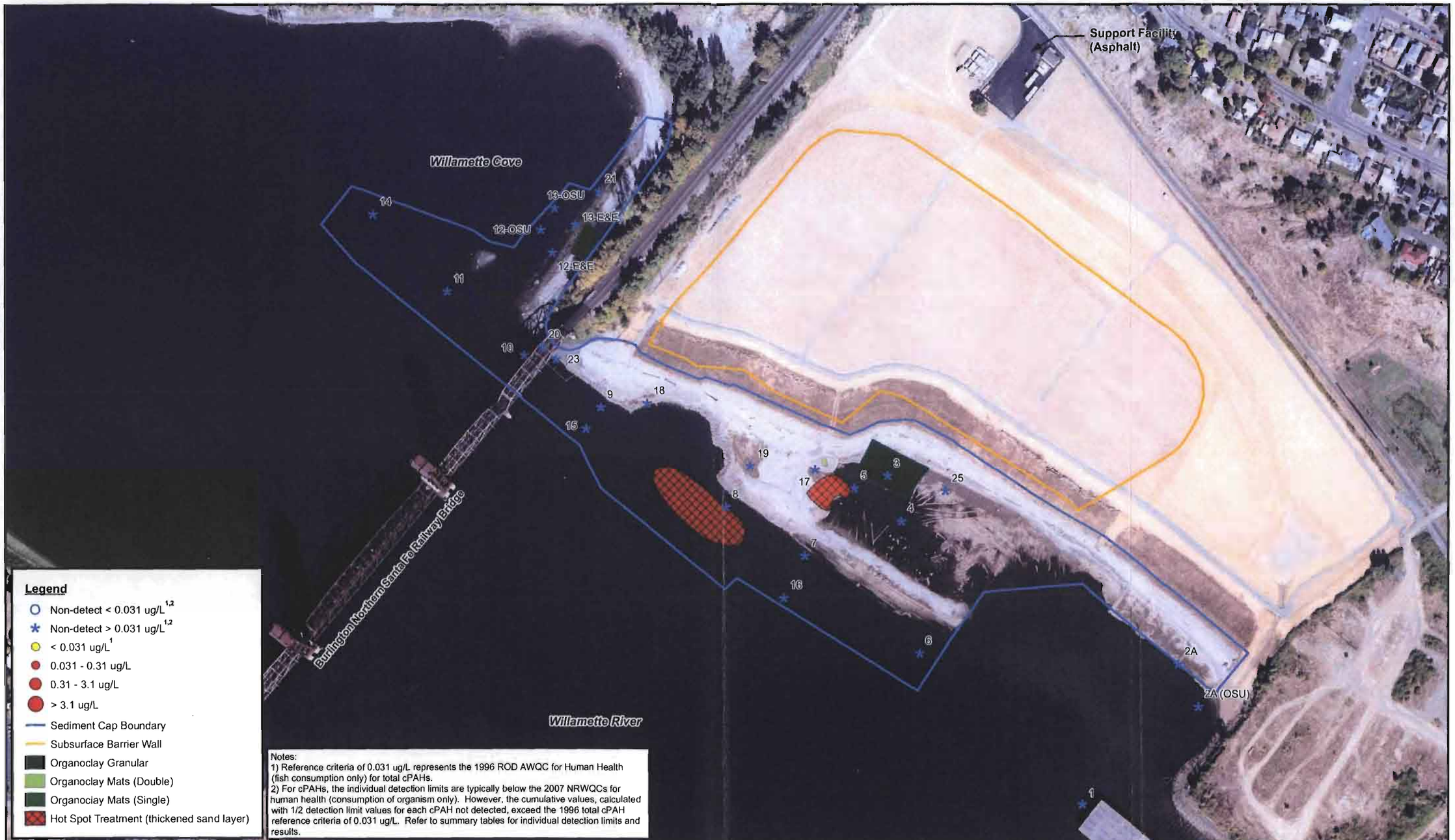
Portland, Oregon

Figure 3-2
Sample Location Map
Fall 2003 Sampling Event

Date:	Drawn by:	Job number:
1/30/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-2 oct03 sample loc map.mxd



Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm.
River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-3a
Fall 2005 cPAHs Surface Water Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3a fall 2005 cpah sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-3b
Spring 2006 cPAHs Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3b spring 2006 cpah sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-3c
Fall 2006 cPAHs Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\2007 october report figures\figure 3-3c fall 2006 cpah sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-3d
Spring 2007 cPAHs Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3d spring 2007 sw cpahs.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-3e
Fall 2007 cPAHs Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3e spring 2007 sw cpahs.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

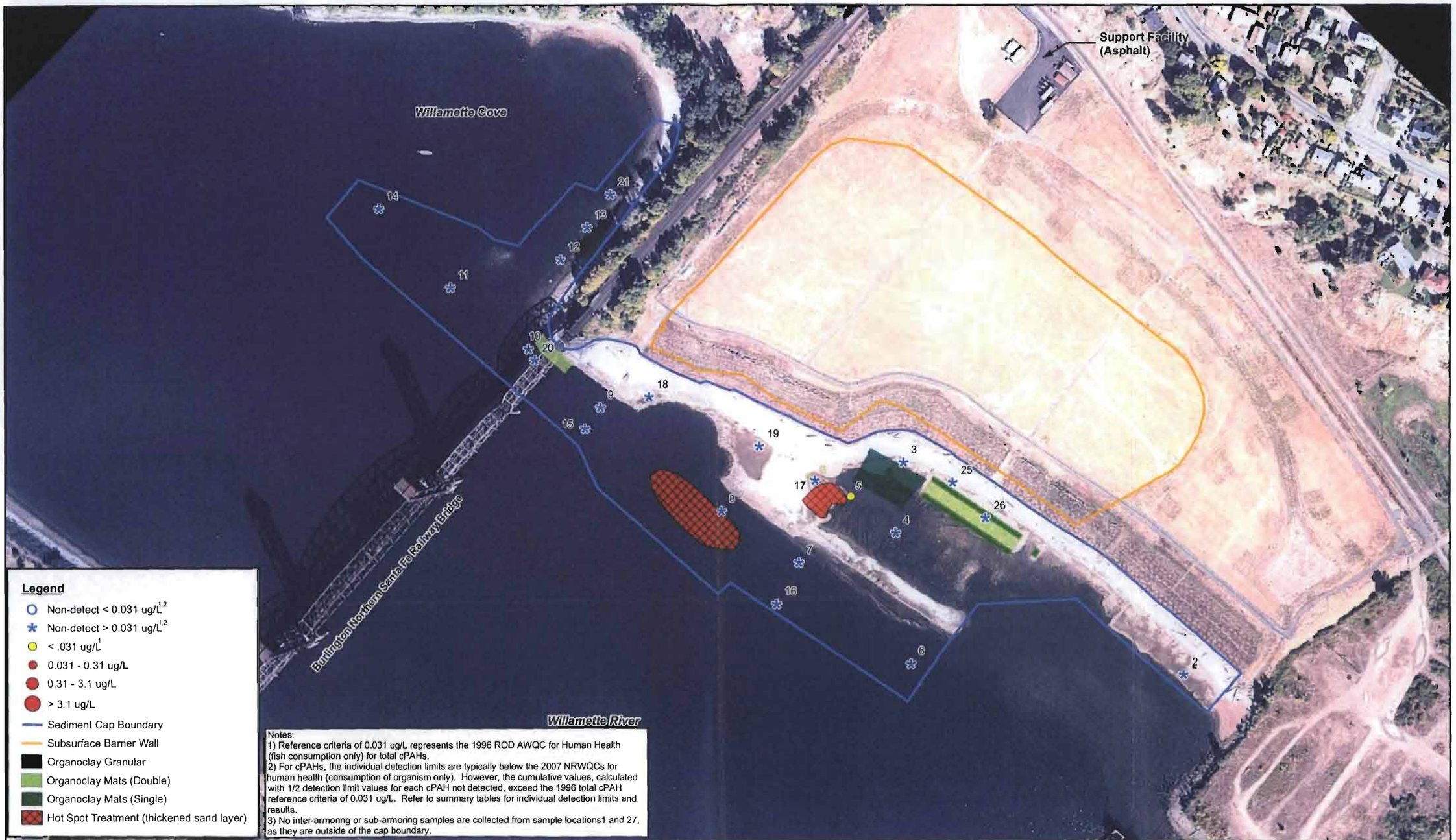
McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-4a
Spring 2006 cPAHs Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-4a spring 2006 cpah sw.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

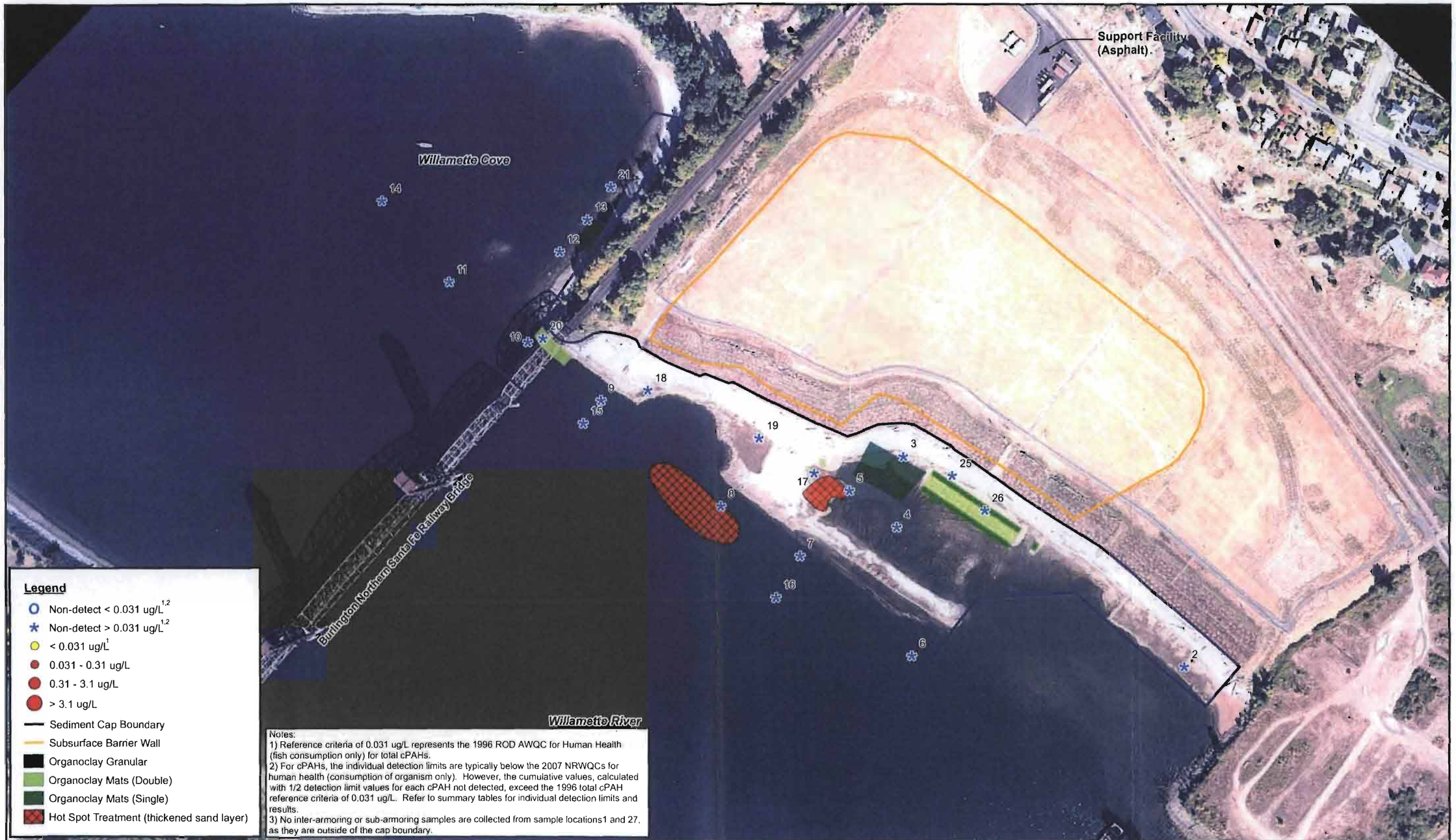
McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-4b
Fall 2006 cPAHs Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-4b fall 2006 cpah sw.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-4c
Spring 2007 cPAHs Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\mcbax\2007 october report figures\figure 3-4c spring 2007 ia cpahs.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-4d
Fall 2007 cPAHs Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-4d fall 2007 ia cpahs.mxd

N W E S

0 50 100 200 300 400 500
Feet
Approximate Scale

Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm. River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

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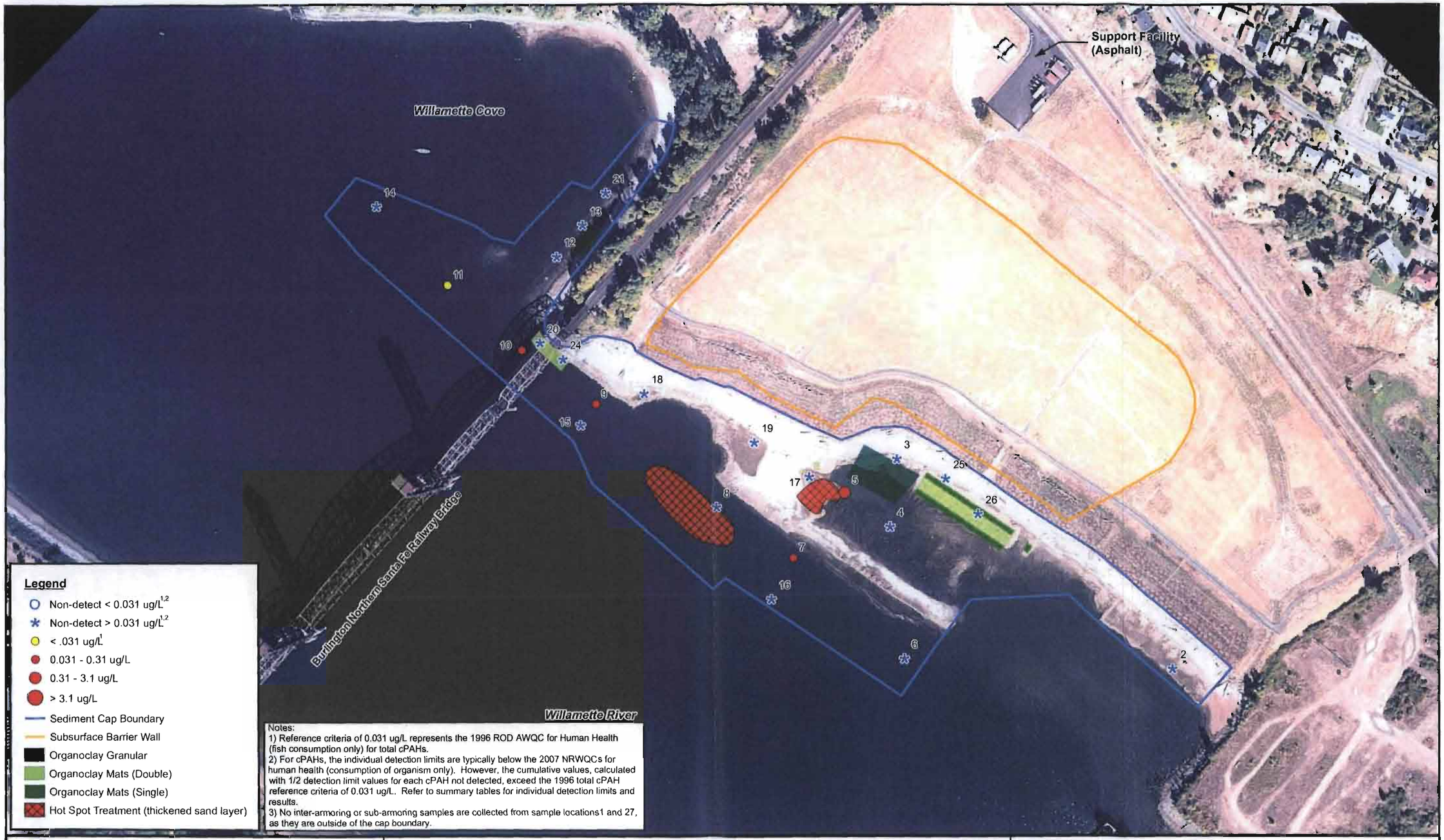
Figure 3-5a
Fall 2005 cPAHs Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3a fall 2005 cpah sw.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

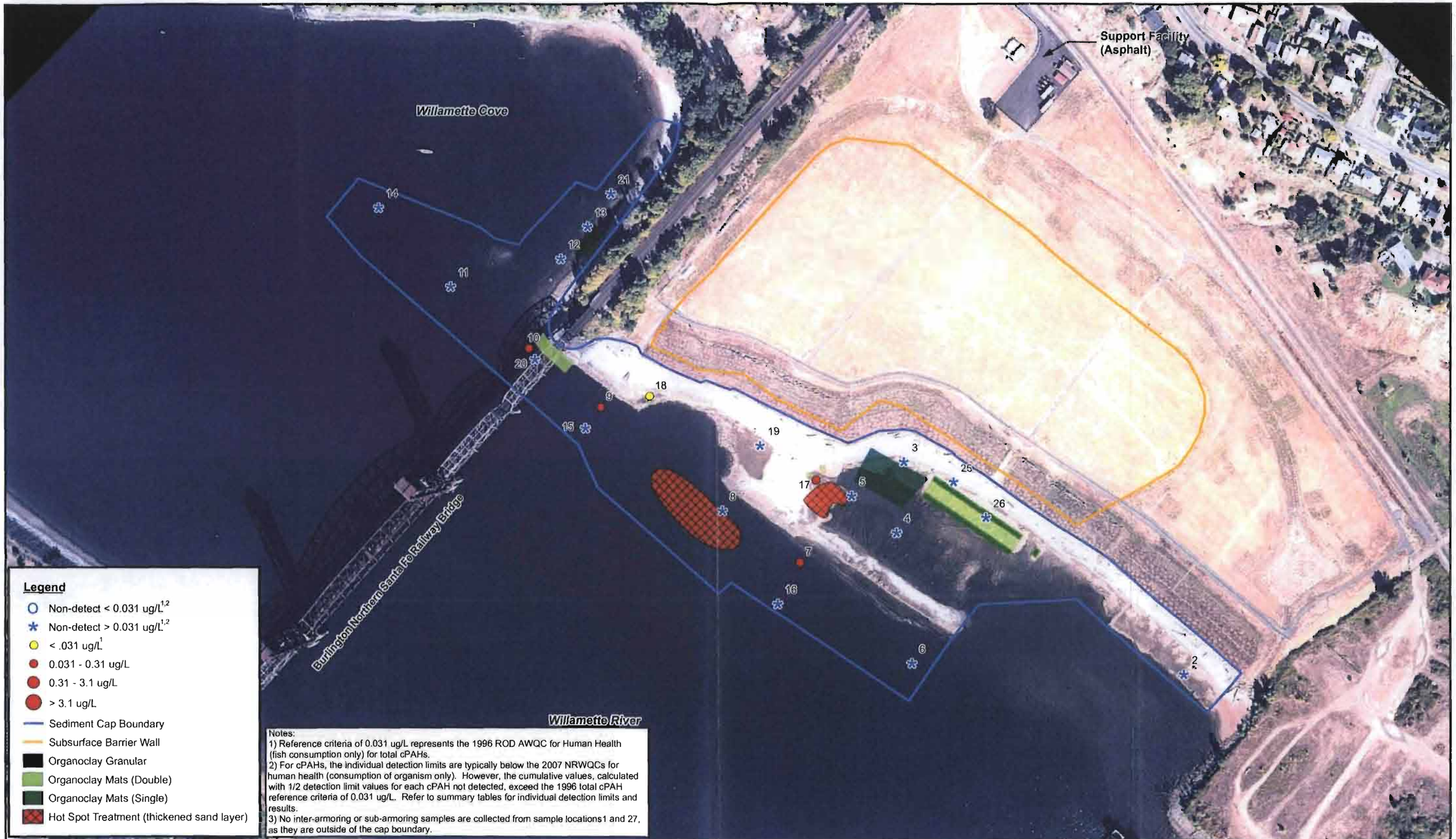
McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-5b
Spring 2006 cPAHs Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-5b spring 2006 cpah sa.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

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Figure 3-5c
Fall 2006 cPAHs Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-5c fall 2006 cpah sa.mxd

Notes:
1) Reference criteria of 0.031 ug/L represents the 1996 ROD AWQC for Human Health (fish consumption only) for total cPAHs.
2) For cPAHs, the individual detection limits are typically below the 2007 NRWQCs for human health (consumption of organism only). However, the cumulative values, calculated with 1/2 detection limit values for each cPAH not detected, exceed the 1996 total cPAH reference criteria of 0.031 ug/L. Refer to summary tables for individual detection limits and results.
3) No inter-armoring or sub-armoring samples are collected from sample locations1 and 27, as they are outside of the cap boundary.

N W E S

0 75 150 300 450 600 750
Feet
Approximate Scale

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-5d
Spring 2007 cPAHs Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-5d spring 2007 sa cpahs.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-5e
Fall 2007 cPAHs Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-5e fall 2007 sa cpahs.mxd

Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm.
River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

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Figure 3-6a
Fall 2005 Naphthalene Surface Water Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.04

\edms-projects\mcbax\2007 october report figures\figure 3-6a fall 2005 napthalene sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-6b
Spring 2006 Naphthalene Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\vncbax\\2007 october report figures\figure 3-6b spring 2006 naphthalene sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am. River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-6c
Fall 2006 Naphthalene Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\vmcbax\2007 october report figures\figure 3-6c fall 2006 naphthalene sw.mxd

N W E S

0 75 150 300 450 600 750
Feet
Approximate Scale

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-6d
Spring 2007 Naphthalene Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-6d spring 2007 sw naphthalene.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-6e
Fall 2007 Naphthalene Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-3e spring 2007 sw naphthalene.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-7a
Spring 2006 Naphthalene Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-7a naphthalene ia.mxd.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

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Portland, Oregon

Figure 3-7b
Fall 2006 Naphthalene Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-7b fall 2006 naphthalene ia.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-7c
Spring 2007 Naphthalene Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\vncbax\2007 october report figures\figure 3-7c spring 2007 ia naphthalene.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-7d
Fall 2007 Naphthalene Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 report figures\spring\figure 3-7d spring 2007 ia naphthalene.mxd

Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm.
River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-8a
Fall 2005 Naphthalene Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.04

\edms-projects\mcbax\2007 october report figures\figure 3-8a fall 2005 napthalene sa.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

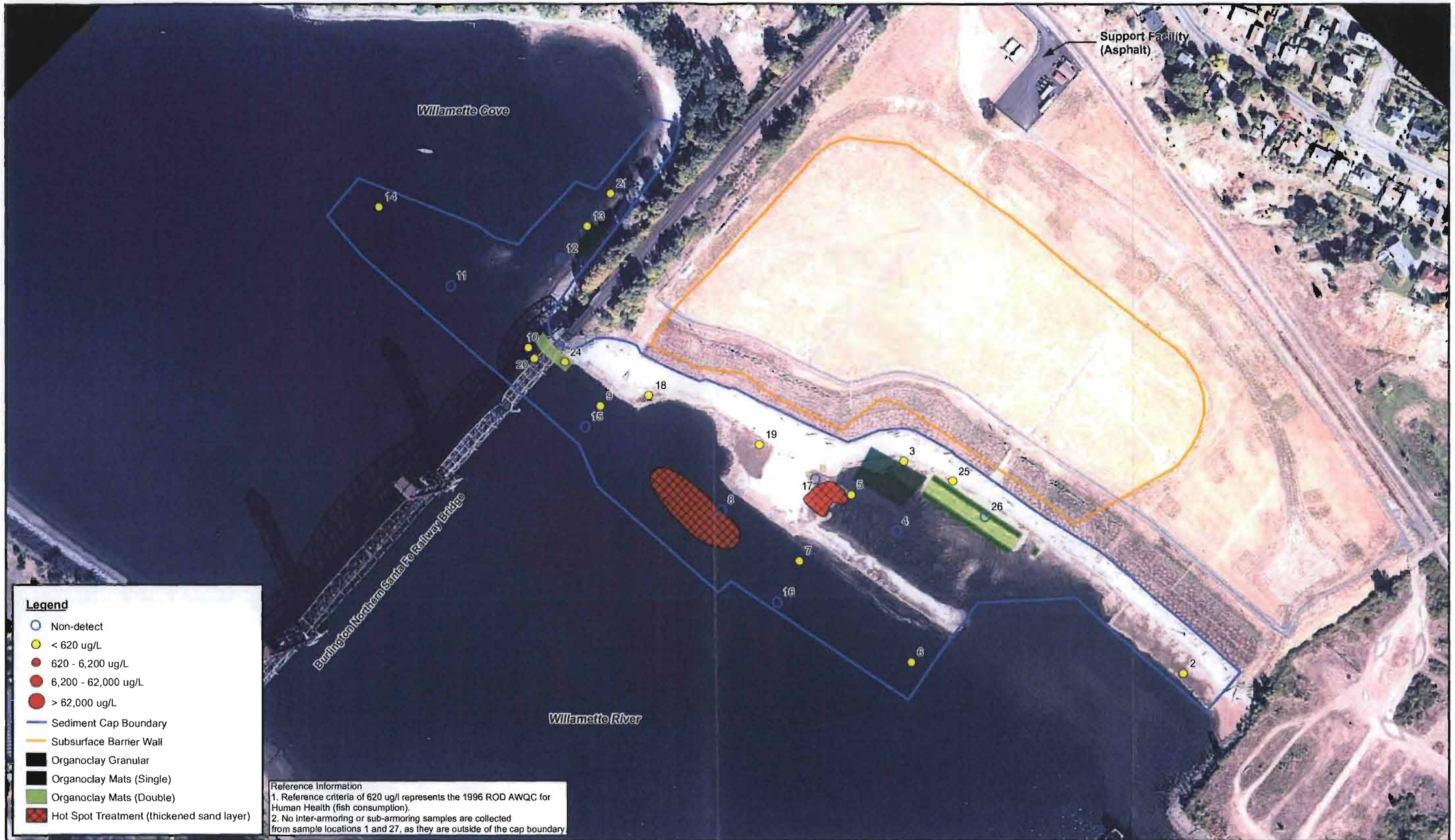
McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-8b
Spring 2006 Naphthalene Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-8b naphthalene sa.mxd.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-8c
Fall 2006 Naphthalene Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-8c fall 2006 naphthalene sa.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-8d
Spring 2007 Naphthalene Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-7d spring 2007 sa naphthalene.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-8e
Fall 2007 Naphthalene Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 report figures\spring\figure 3-8e spring 2007 sa naphthalene.mxd

Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm. River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-9a
Fall 2005 Copper Surface Water Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.04

\edms-projects\mcbax\2007 october report figures\figure 3-9a fall 2005 copper sw.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-9b
Spring 2006 Copper Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-9b copper sw.mxd.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

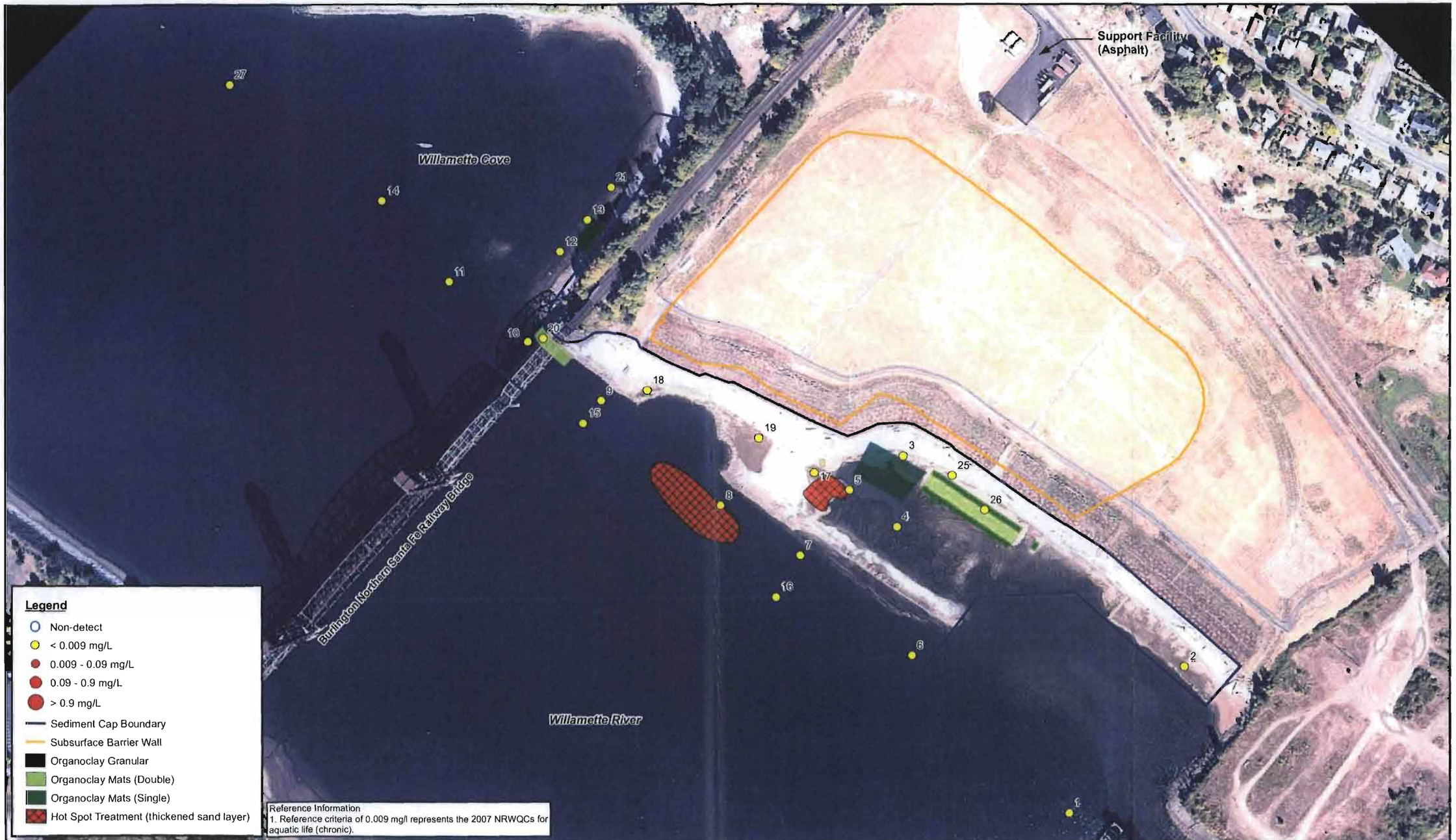
McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-9c
Fall 2006 Copper Surface Water Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-9c fall 2006 copper sw.mxd



Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-9d
Spring 2007 Copper Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-9d spring 2007 sw copper.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-9e
Fall 2007 Copper Surface Water Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 report figures\spring\figure 3-9e spring 2007 sw copper.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am. River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-10a
Spring 2006 Copper Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-10a copper ia.mxd.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-10b
Fall 2006 Copper Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-10b fall 2006 copper ia.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-10c
Spring 2007 Copper Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

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Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-10d
Fall 2007 Copper Inter-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

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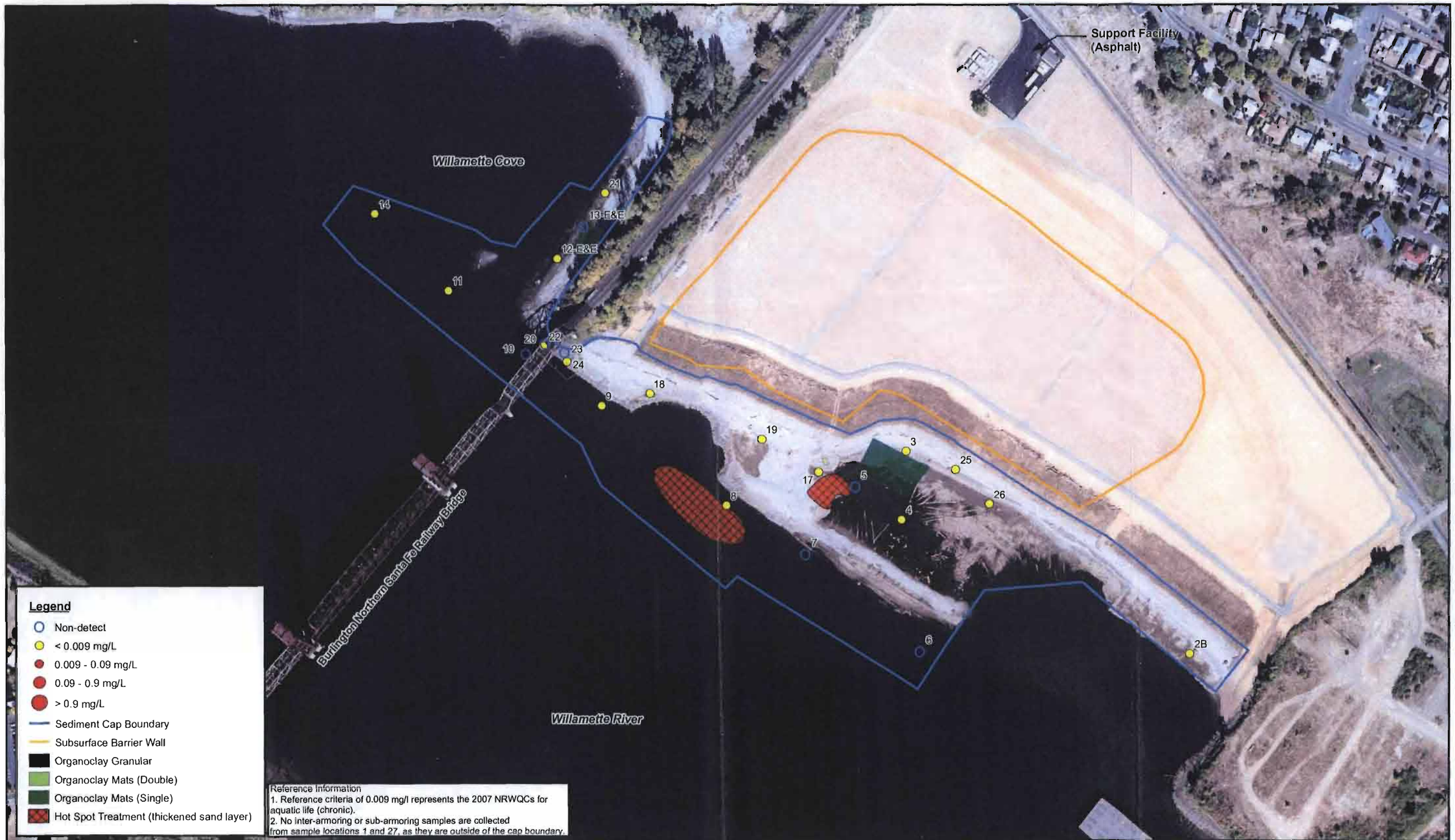


Map Reference: Orthorectified Photo Image, September 28, 2005 @ 12:30 pm.
River Stage at Time of Photo is 4.93 ft. NAVD at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-11a
Fall 2005 Copper Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/9/2007	avh	002688.OY28.04

\edms-projects\mcbax\2007 october report figures\figure 3-11a fall 2005 copper sa.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-11b
Spring 2006 Copper Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-11b copper sa.mxd.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45 am.
River Stage at Time of Photo is 5.21 ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-11c
Fall 2006 Copper Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/4/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-11c fall 2006 copper sa.mxd

N W E S

0 75 150 300 450 600 750

Feet

Approximate Scale

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-11d
Spring 2007 Copper Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 october report figures\figure 3-11d spring 2007 sa copper.mxd

Map Reference: Orthorectified Photo Image, October 2, 2006 @ 11:45am.
River Stage at Time of Photo is 5.21' ft. NAVD88 at Morrison Street Bridge.

McCormick & Baxter Creosoting Company

Portland, Oregon

Figure 3-11e
Fall 2007 Copper Sub-Armoring Sample Results

Date:	GIS:	Job Number:
12/2/2007	avh	002688.OY28.09

\edms-projects\mcbax\2007 report figures\spring\figure 3-11e spring 2007 sa copper.mxd

Figure 3-12. Mean Concentrations for Arsenic in Surface, Inter-Armoring, Sub-Armoring Water Samples

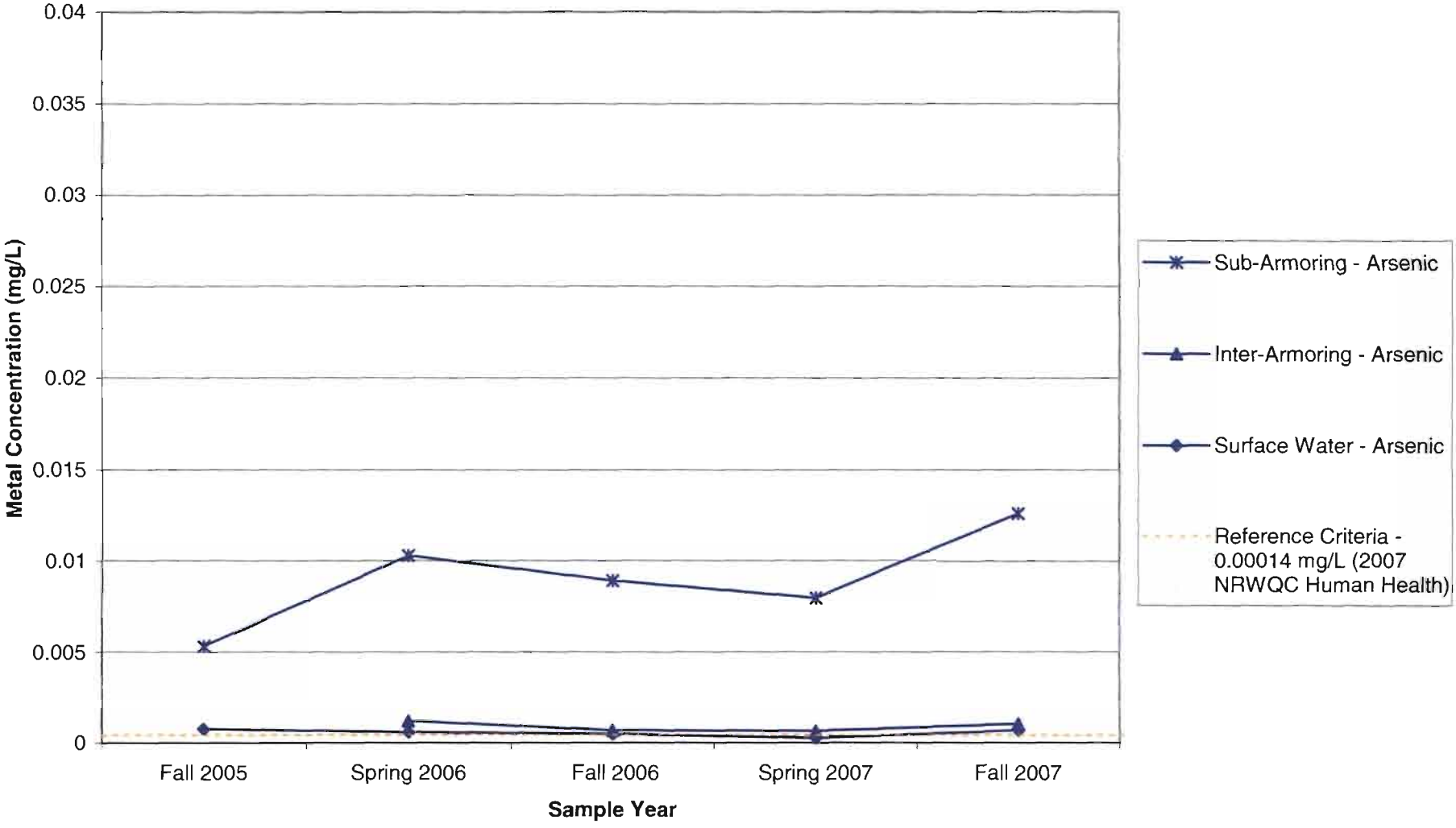


Figure 3-13. Mean Concentrations for Copper in Surface, Inter-Armoring, and Sub-Armoring Water Samples

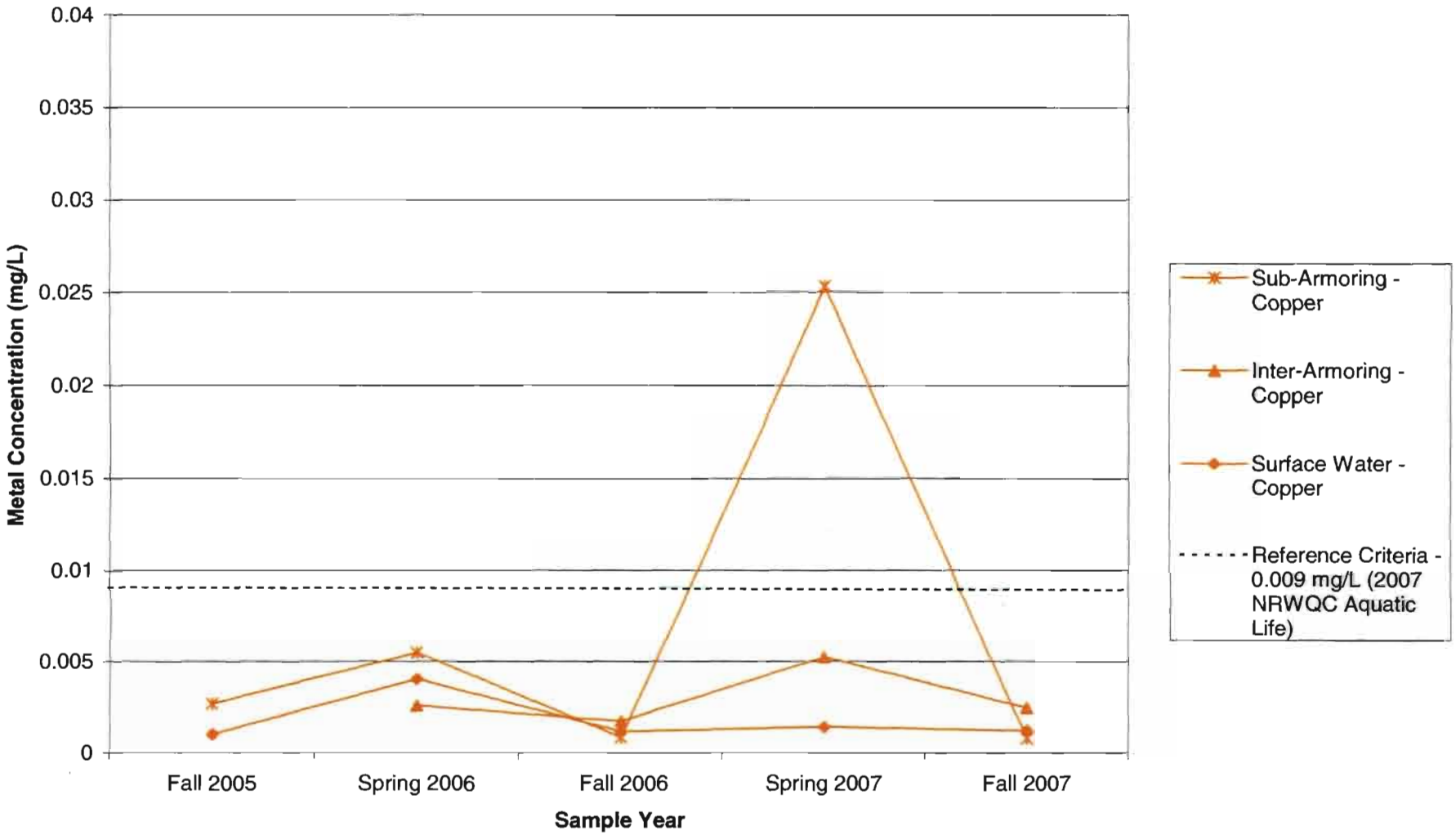
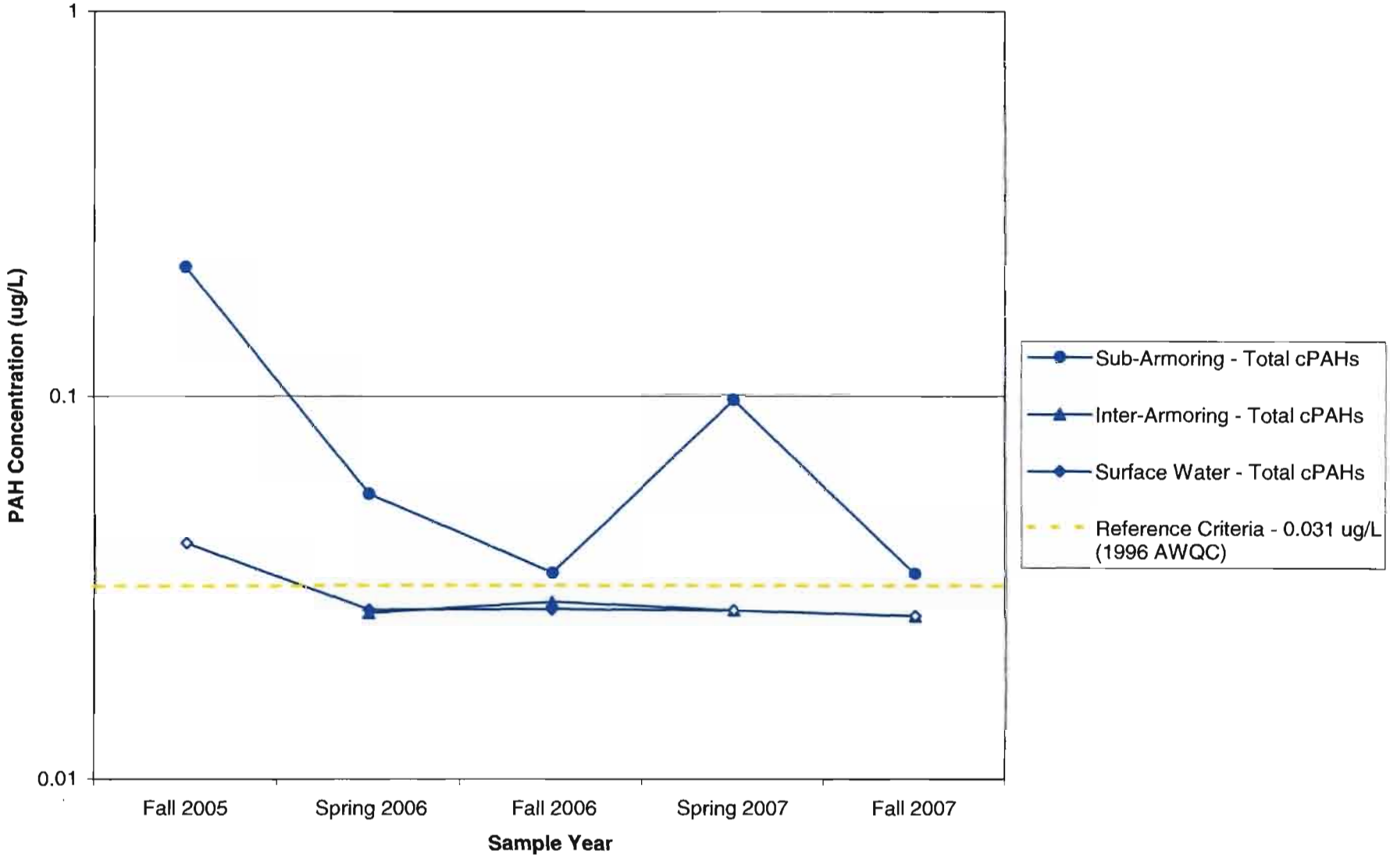
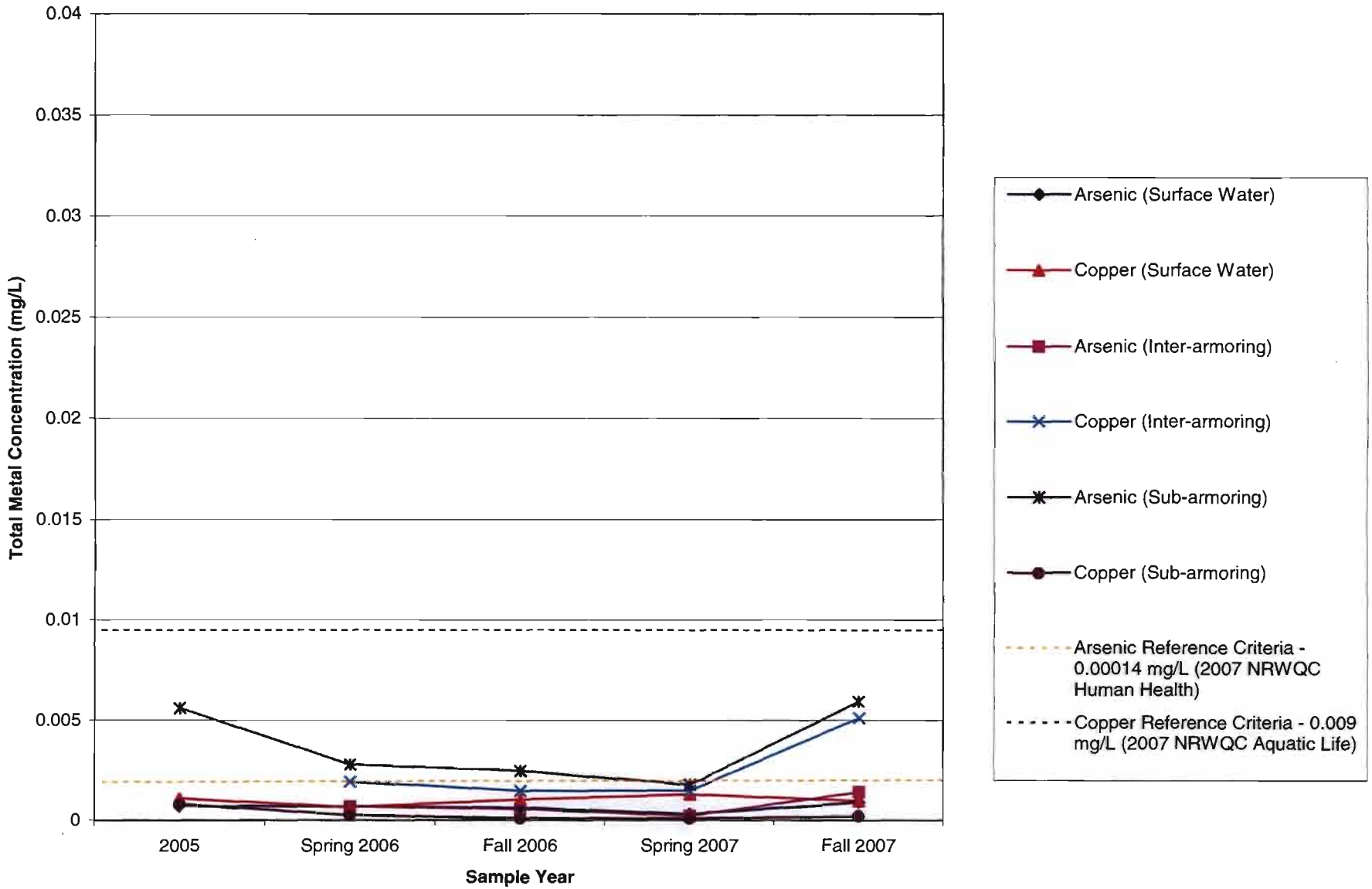


Figure 3-14. Mean Concentrations for Total Carcinogenic Polynuclear Aromatic Hydrocarbons in Surface, Inter-Armoring, and Sub-Armoring Water Samples (Log Scale)



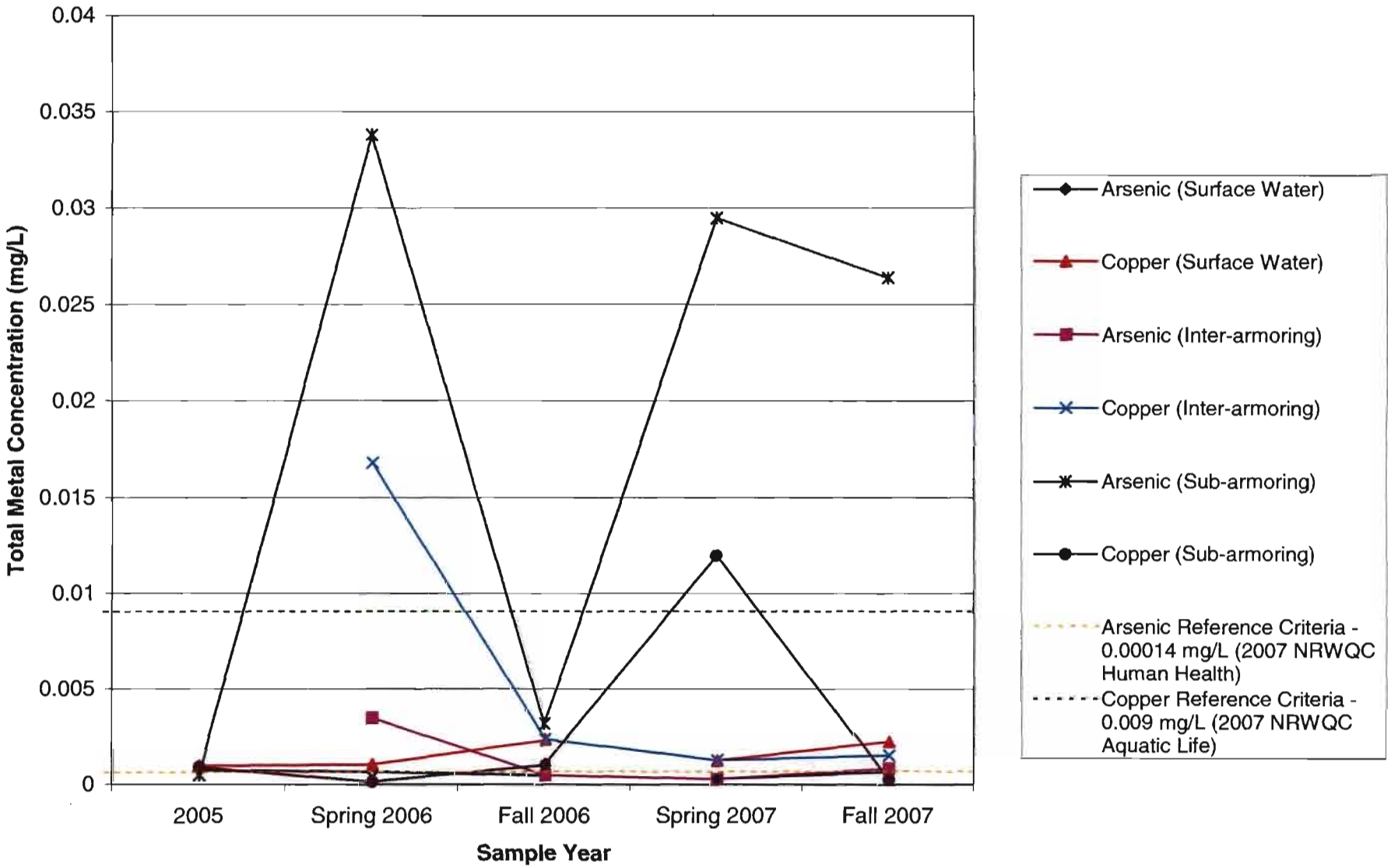
Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-15. Location 10 Concentrations for Total Arsenic and Copper in Surface Water, Inter-armoring Water, and Sub-armoring Water Samples



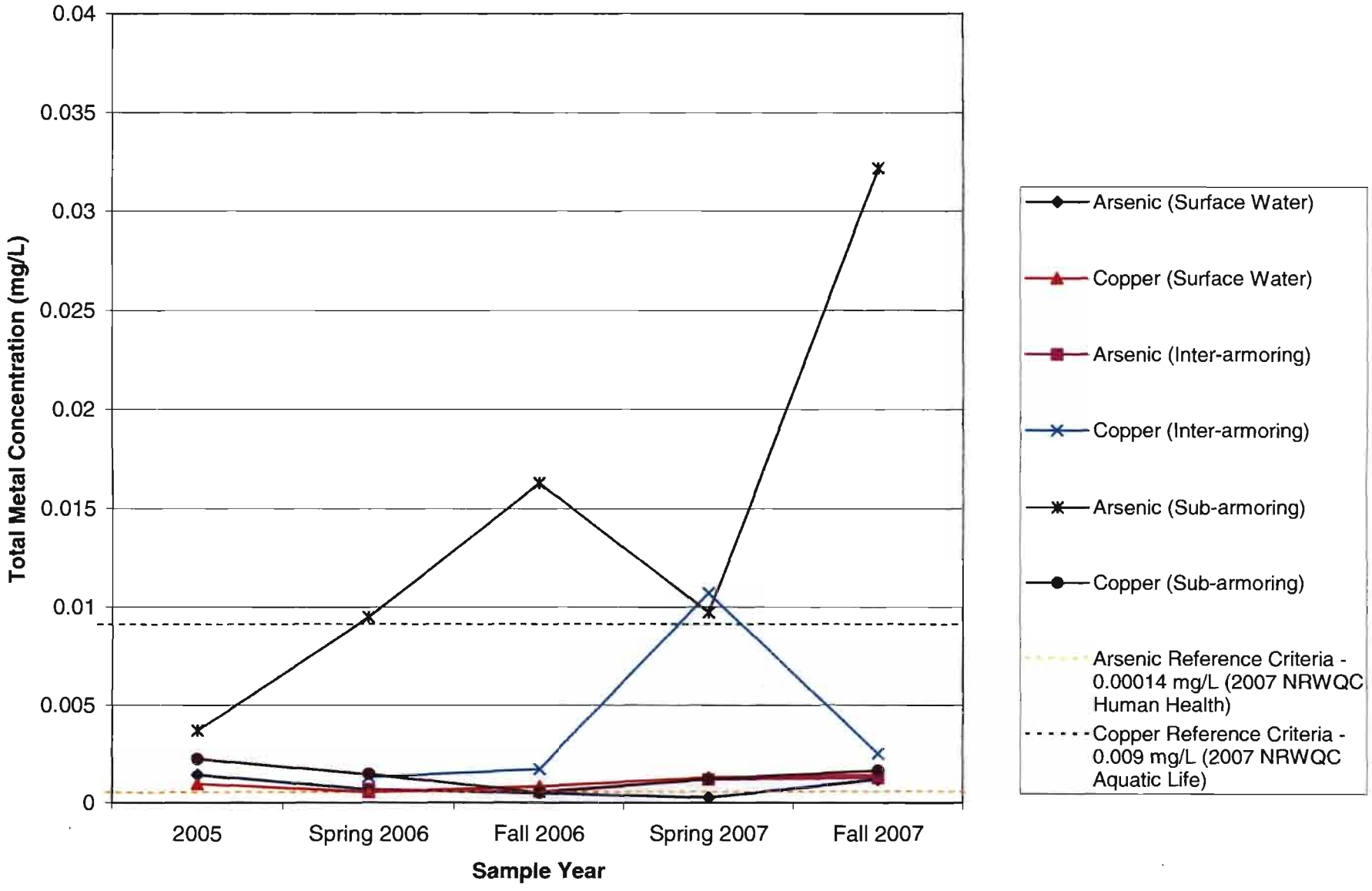
Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-16. Location 12 Concentrations for Total Arsenic and Copper in Surface Water, Inter-armoring Water, and Sub-armoring WaterSamples



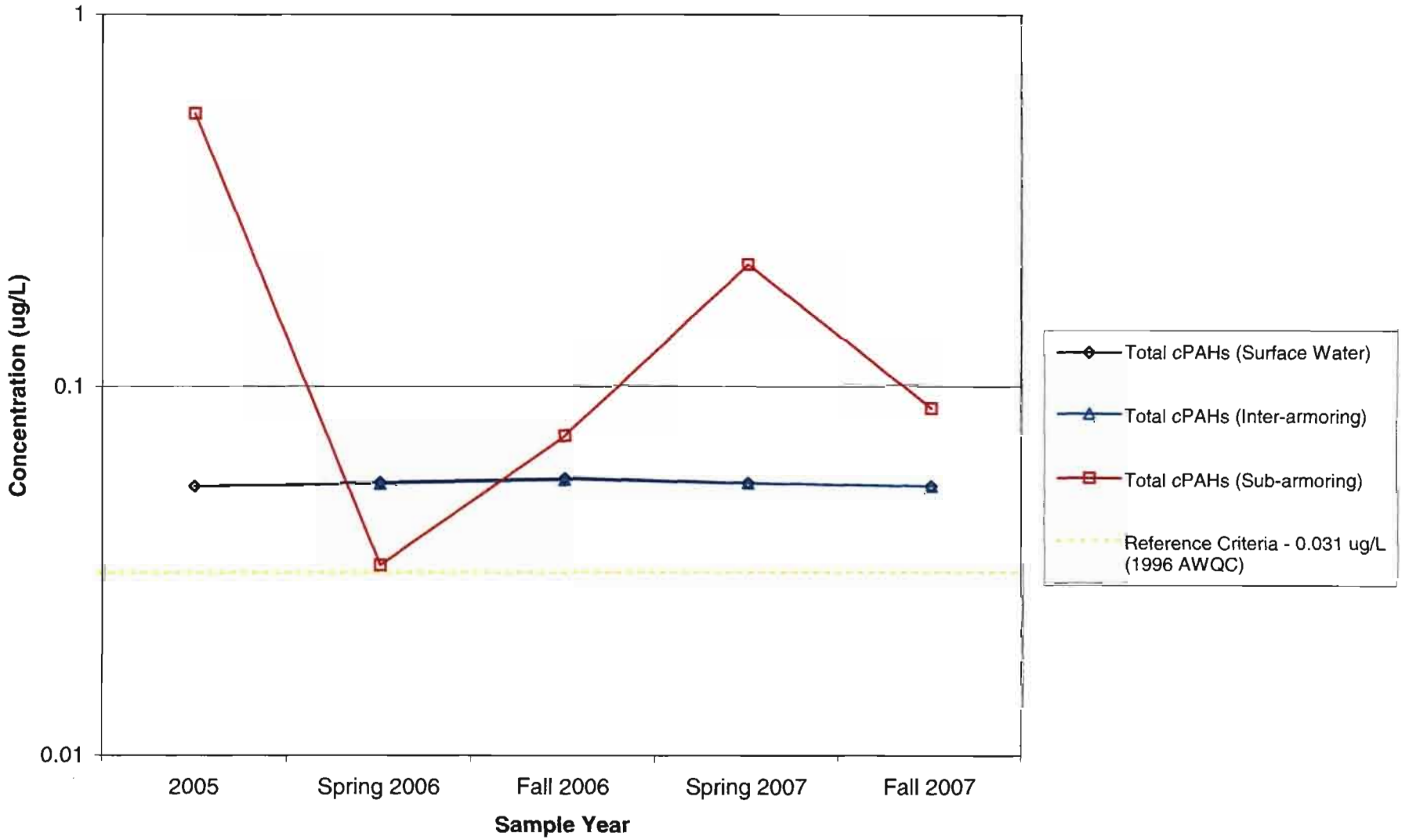
Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-17. Location 4 Concentrations for Total Arsenic and Copper in Surface Water, Inter-armoring Water, and Sub-armoring Water Samples



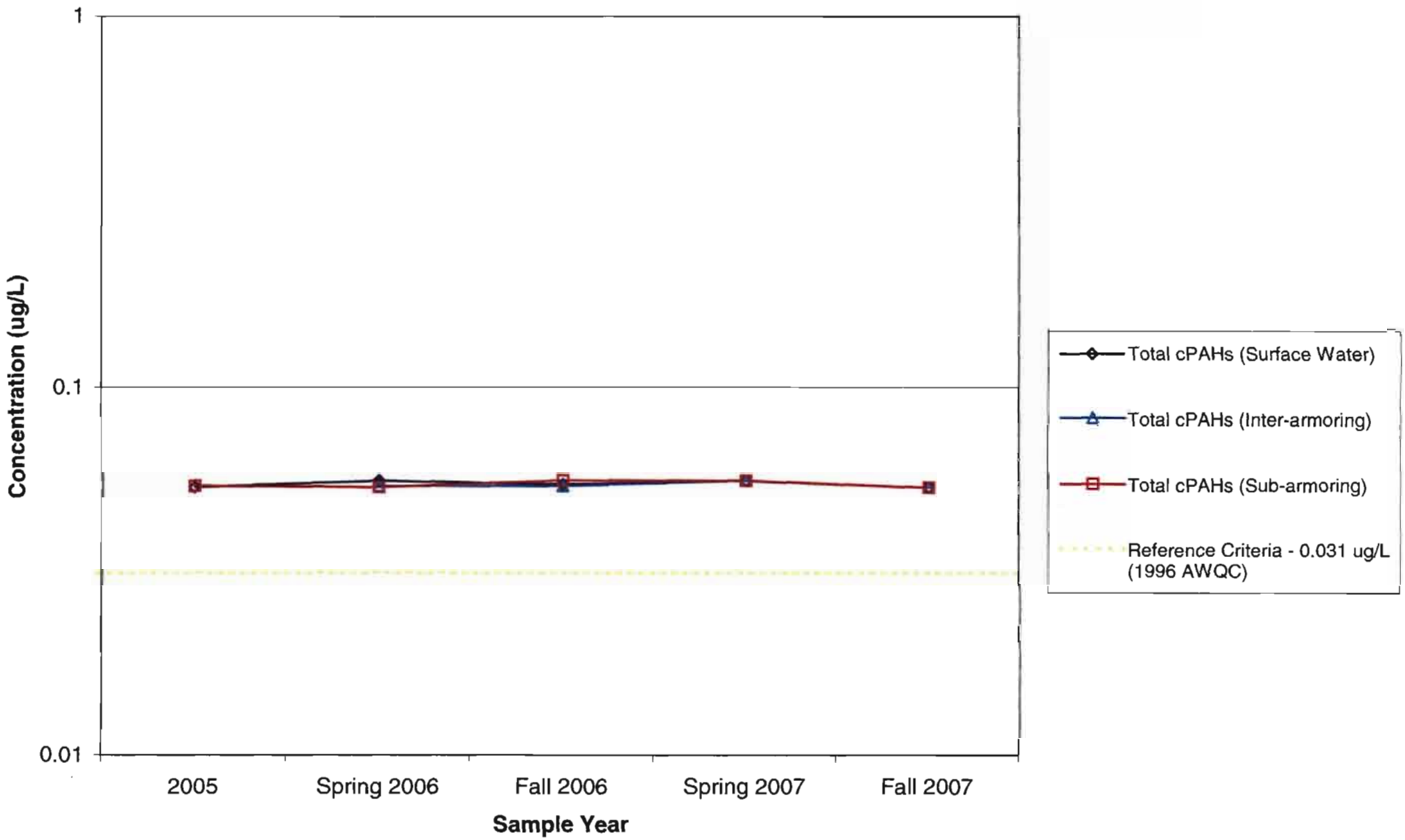
Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-18. Location 10 Concentrations for Total Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs) in Surface Water, Inter-Armoring Water, and Sub-Armoring Water Samples (Log Scale)



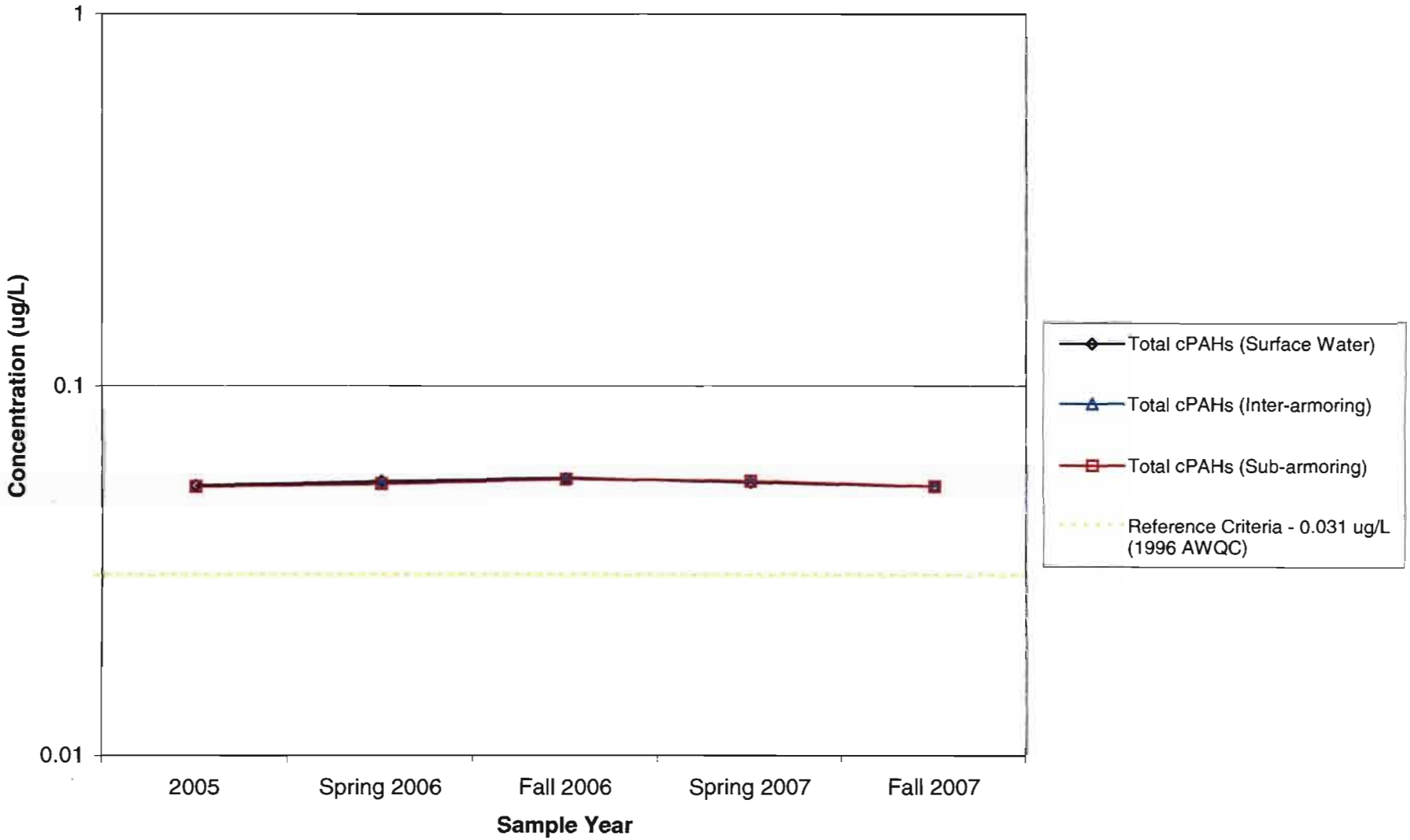
Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-19. Location 12 Concentrations for Total Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs) in Surface Water, Inter-Armoring Water, and Sub-Armoring Water Samples (Log Scale)



Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Figure 3-20. Location 4 Concentrations for Total Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs) in Surface Water, Inter-Armoring Water, and Sub-Armoring Water Samples (Log Scale)



Note: Open marker indicates compound was not detected. Marker is placed at detection limit.

Tables

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Table 3-1a
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water Summary Data
Fall 2002

Sample ID / Sample Date		Sediment Cap Performance Goals: McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		Comparison Criteria: EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		Primary Drinking Water Regulations (NPDWRs)	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]							
Metals (ug/L or mg/L see notes page)[4]													
Arsenic		190		150	0.14	10	15	27%	1.1	SED-6	0.330533333	NP	0.530515
Chromium		210		74		100	15	33%	2.1	SED-8	0.573734	NP	0.978706
Copper		12		9			15	100%	20.9	SED-7	4.620026667	Gamma	15.82394
Zinc		110		120	26,000		15	100%	18.1	SED-9	4.865658667	NP	8.263584
Pentachlorophenol (ug/L)		13		11	3	1	15	40%	0.079	SED-3	0.0684	NP	0.123299
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)													
Acenaphthene	L	520			990		15	13%	9.8	SED-6	0.66344	NP	7.156843
Acenaphthylene	L						15	7%	0.042	SED-6	0.012673333	NP	0.016747
Anthracene	L				40,000		15	7%	3.8	SED-6	0.263206667	NP	2.776827
Benzo[a]anthracene	H, C				0.018		15	27%	1.5	SED-6	0.11282	NP	1.099229
Benzo[b]fluoranthene	H, C				0.018		15	7%	0.77	SED-6	0.061206667	NP	0.56496
Benzo[k]fluoranthene	H				0.018		15	7%	0.39	SED-6	0.035873333	NP	0.14614
Benzo[a]pyrene	H, C				0.018	0.2	15	7%	0.44	SED-6	0.044073333	NP	0.167401
Benzo[g,h,i]perylene	H, C						15	7%	0.087	SED-6	0.015673333	NP	0.037927
Chrysene	H, C				0.018		15	27%	1.2	SED-6	0.092913333	NP	0.880299
Dibenzo[a,h]anthracene	H, C				0.018		15	20%	0.093	SED-6	0.02695	NP	0.037425
Fluoranthene	H		54		140		15	60%	11.9	SED-6	0.80679	NP	8.690823
Fluorene	L				5300		6	0%	ND	N/A	0.012016667	NP	0.012299
Ideno[1,2,3-cd]pyrene	H, C				0.018		15	7%	0.13	SED-6	0.023406667	NP	0.056801
Naphthalene	L	620					15	7%	3.3	SED-6	0.229873333	NP	2.411831
Phenanthrene	L						15	33%	22.7	SED-6	1.52394	NP	16.57388
Pyrene	H				4,000		15	33%	5.3	SED-6	0.364506667	NP	3.872194
Total LPAHs							15	33%	39.6	SED-6	2.663636667	NP	28.91452
Total HPAHs							15	60%	21.8	SED-6	1.48207	NP	15.925702
Total Carcinogenic PAHs			0.031				15	20%	4.22	SED-6	0.327048333	NP	3.095126
Total PAHs							15	60%	61.5	SED-6	4.158003333	NP	44.911386

Table 3-1a
McCormick and Baxter Creosoting Company
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Sample ID		Statistical Results Not Including Sample SED-6							SED-1		SED-2		SED-3		SED-4	
Sample Date		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	9/5/2002		9/5/2002		9/6/2002		9/6/2002	
CONTAMINANT OF INTEREST																
Metals (ug/L or mg/L see notes page)[4]																
Arsenic		14	21%	0.94	SED-8	0.275571429	NP	0.439541	0.63	U	0.63	U	0.63	U	0.67	U
Chromium		14	36%	2.1	SED-8	0.568286429	NP	0.970079	1.3	U	1.3	U	1.3	U	1.3	U
Copper		14	100%	20.9	SED-7	4.7286	Gamma	18.12549	**2**		**8.45**		**2.4**		**2.7**	
Zinc		14	100%	18.1	SED-9	4.585348571	NP	9.557181	**4.7**		**7.53**		**4.3**		**4.4**	
Pentachlorophenol (ug/L)		14	36%	0.079	SED-3	0.067714286	Max	0.079	0.018	U	0.019	U	**0.079**		**0.019**	
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																
Acenaphthene	L	14	7%	0.013	SED-8	0.010828571	NP	0.011507	0.018	U	0.019	U	0.02	U	0.019	U
Acenaphthylene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Anthracene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Benzo[a]anthracene	H, C	14	21%	0.0195	#N/A	0.013735714	Gamma	0.019516	0.036	U	0.037	U	0.039	U	0.037	U
Benzo[b]fluoranthene	H, C	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Benzo[k]fluoranthene	H	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Benzo[a]pyrene	H, C	14	0%	ND	N/A	0.015792857	NP	0.017409	0.036	U	0.037	U	0.039	U	0.037	U
Benzo[g,h,i]perylene	H, C	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Chrysene	H, C	14	21%	0.0195	#N/A	0.013835714	Gamma	0.019451	0.036	U	0.037	U	0.039	U	0.037	U
Dibenzo[a,h]anthracene	H, C	14	14%	0.037	SED-2	0.022232143	Gamma	0.026479	0.036	U	0.037	U	0.039	U	0.037	U
Fluoranthene	H	14	57%	0.032	SED-3	0.014417857	Gamma	0.019225	0.018	U	**0.0084**		**0.032**		**0.0071**	**J**
Fluorene	L	6	0%	ND	N/A	0.012016667	NP	0.012299								
Ideno[1,2,3-cd]pyrene	H, C	14	0%	ND	N/A	0.015792857	NP	0.017397	0.036	U	0.037	U	0.039	U	0.037	U
Naphthalene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	0.018	U	0.019	U	0.02	U	0.019	U
Phenanthrene	L	14	29%	0.018	SED-1	0.011364286	Gamma	0.01253	0.018	U	**0.0098**		**0.013**		0.019	U
Pyrene	H	14	29%	0.018	SED-1	0.011971429	Gamma	0.013209	0.018	U	0.019	U	**0.016**		0.019	U
Total LPAHs		14	29%	0.013	SED-3 AND SED-8 (ug/L)	0.025325	Max	0.013	0.045	U	**0.0098**		**0.013**		0.0475	U
Total HPAHs		14	57%	0.074	SED-9	0.030789286	Max	0.074	0.045	U	**0.0084**		**0.048**		**0.0071**	
Total Carcinogenic PAHs		14	14%	0.045	SED-9	0.048980357	NP	0.059337	0.108	U	0.1115	U	0.1175	U	0.1115	U
Total PAHs		14	57%	0.0827	SED-9	0.062146429	Max	0.0827	0.18	U	**0.0182**		**0.061**		**0.0071**	

Table 3-1a
McCormick and Baxter Creosoting Company
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Sample ID		SED-5		SED-6		SED-7		SED-8		SED-9		SED-51 (5A)		SPMD-1		SPMD-2	
Sample Date		9/5/2002		9/6/2002		9/5/2002		9/5/2002		9/6/2002		(Duplicate of SED-5) 9/5/2002		9/12/2002 10:00:00 AM		9/12/2002 10:55:00 AM	
CONTAMINANT OF INTEREST																	
Metals (ug/L or mg/L see notes page)[4]																	
Arsenic		0.64		1.1		0.63	U	0.94		0.68		0.63	U	0.001	U	0.001	U
Chromium		1.3		1.3	U	1.3	U	2.1		1.3		1.3	U	0.001	U	0.001	U
Copper		3.9		3.1		20.9		5.5		5		19.2		0.00376		0.00207	
Zinc		4.9		8.79		7.4		12.5		18.1		5.2		0.00767		0.00509	
Pentachlorophenol (ug/L)		0.018	U	0.078		0.051		0.025		0.019	U	0.025		0.236	U	0.238	U
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																	
Acenaphthene	L	0.018	U	9.8		0.019	U	0.013	J	0.019	U	0.019	U	0.0236	U	0.0238	U
Acenaphthylene	L	0.018	U	0.042		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Anthracene	L	0.018	U	3.8		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Benzo[a]anthracene	H, C	0.036	U	1.5		0.037	U	0.0051	J	0.0041		0.037	U	0.0236	U	0.0238	U
Benzo[b]fluoranthene	H, C	0.018	U	0.77		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Benzo[k]fluoranthene	H	0.018	U	0.39		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Benzo[a]pyrene	H, C	0.036	U	0.44		0.037	U	0.038	U	0.037	U	0.037	U	0.0236	U	0.0238	U
Benzo[g,h,i]perylene	H, C	0.018	U	0.087		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Chrysene	H, C	0.036	U	1.2		0.037	U	0.0067	J	0.0039		0.037	U	0.0236	U	0.0238	U
Dibenzo[a,h]anthracene	H, C	0.036	U	0.093	J	0.037	U	0.038	U	0.037		0.037	U	0.0472	U	0.0476	U
Fluoranthene	H	0.0041		11.9		0.0083	J	0.024	J	0.018		0.0043	J	0.0236	U	0.0238	U
Fluorene	L													0.0236	U	0.0238	U
Ideno[1,2,3-cd]pyrene	H, C	0.036	U	0.13		0.037	U	0.038	U	0.037	U	0.037	U	0.0236	U	0.0238	U
Naphthalene	L	0.018	U	3.3		0.019	U	0.019	U	0.019	U	0.019	U	0.0236	U	0.0238	U
Phenanthrene	L	0.018		22.7		0.019	U	0.019	U	0.0087		0.019	U	0.0236	U	0.0238	U
Pyrene	H	0.018		5.3		0.019	U	0.013	J	0.011		0.019	U	0.0236	U	0.0238	U
Total LPAHs		0.045	U	39.6		0.0475	U	0.013		0.0087		0.0475	U	0.0708	U	0.0714	U
Total HPAHs		0.0041		21.8		0.0083		0.0488		0.074		0.0043		0.0708	U	0.0714	U
Total Carcinogenic PAHs		0.108	U	4.22		0.1115	U	0.0118		0.045		0.1115	U	0.0944	U	0.0952	U
Total PAHs		0.0041		61.5		0.0083		0.0618		0.0827		0.0043		0.2006	U	0.2023	U

Table 3-1a
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Sample ID		SPMD-5		SPMD-11		SPMD-15		SPMD-15 (duplicate)		SPMD-20	
Sample Date		9/12/2002 5:10:00 PM		9/12/2002 4:00:00 PM		9/12/2002 3:00:00 PM		9/12/2002 3:00:00 PM		9/12/2002 1:40:00 PM	
CONTAMINANT OF INTEREST											
Metals (ug/L or mg/L see notes page)[4]											
Arsenic		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Chromium		0.001	U	**0.00101**		0.001	U	**0.00300**		0.001	U
Copper		**0.00584**		**0.0256**		0.002	U	**0.00951**		**0.00362**	
Zinc		**0.00602**		**0.0169**		0.005	U	**0.0221**		**0.00710**	
Pentachlorophenol (ug/L)		0.236	U	0.239	U	0.253	U	0.249	U	0.24	U
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)											
Acenaphthene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Acenaphthylene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Anthracene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Benzo[a]anthracene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Benzo[b]fluoranthene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Benzo[k]fluoranthene	H	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Benzo[a]pyrene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Benzo[g,h,i]perylene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Chrysene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Dibenzo[a,h]anthracene	H, C	0.0472	U	0.0478	U	0.0506	U	0.0498	U	0.0481	U
Fluoranthene	H	0.0236	U	0.0239	U	0.0253	U	**0.0313**		0.024	U
Fluorene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Ideno[1,2,3-cd]pyrene	H, C	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Naphthalene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Phenanthrene	L	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Pyrene	H	0.0236	U	0.0239	U	0.0253	U	0.0249	U	0.024	U
Total LPAHs		0.0708	U	0.0717	U	0.0759	U	0.0747	U	0.072	U
Total HPAHs		0.0708	U	0.0717	U	0.0759	U	**0.0313**		0.072	U
Total Carcinogenic PAHs		0.0944	U	0.0956	U	0.1012	U	0.0996	U	0.09605	U
Total PAHs		0.2006	U	0.20315	U	0.21505	U	**0.0313**		0.20405	U

Table 3-1a
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water Summary Table Notes and Key
Fall 2002

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

[4] Metals for SED-1 through SED-9 and SED-51 samples are reported in ug/L; metals for SPMD-1, 2, 5, 11, and 15 are reported in mg/L. Sediment cap performance goals and comparison criteria are shown in ug/L.

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

Surface water grab samples SED-1 through SED-9 and SED-51 collected by EPA dive team in September 2002. SPMD samples collected by OSU on behalf of DEQ on 9/12/2002.

Samples collected approximately 1 foot off river bottom.

SED samples analyzed by EPA, Region 10, Manchester Environmental Laboratory, Port Orchard, Washington. SPMD samples analyzed by North Creek Analytical, Beaverton, Oregon

Laboratory data sheets are provided in Appendix B of the report *Surface Water, Sediment, and Groundwater Sampling Report, September 2002 McCormick & Baxter Creosoting Company Site, Portland, Oregon*

Sample SED-51 (5A) is a duplicate sample of SED-5.

KEY:
C = Carcinogenic PAH
Gamma = Gamma Distribution
H = High Molecular Weight PAH (HPAH)
J = Estimated Value
L = Low Molecular Weight PAH (LPAH)
MDL = Method Detection Limit.
mg/L = milligrams per liter
MRL = Method Reporting Limit.
N/A= Not Applicable
ND = Not Detected
NP = Nonparametric Distribution
U = Value Below MDL (value represents MDL)
ug/L = micrograms per liter

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Table 3-1a
McCormick and Baxter Creosoting Company
Portland, Oregon
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Fall 2002

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1b
McCormick and Baxter Creosoting Company
Portland, Oregon
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Sample ID		Sediment Cap Performance Goals		Comparison Criteria									
Sample Date		McCormick & Baxter Record of Decision 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Critera (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]							
TSS (mg/L)							21	100%	180	MBSWGB0326	22	NP	112.5361
DOC (mg/L)							21	100%	3.33	MBSWGB0312	2.21952381	Gamma	2.346213
Pentachlorophenol (ug/L)		13		11	3	1	21	0%	ND	N/A	0.034009524	NP	0.078359
Metals (ug/L)													
Arsenic		190		150	0.14	10	21	81%	2.06	MBSWGB0326	0.952571429	Normal	1.191804
Chromium		210		74		100	21	100%	5.47	MBSWGB0326	2.41	NP	2.714633
Copper		12		9			21	100%	21.1	MBSWGB0315	3.484761905	NP	7.920017
Zinc		110		120	26,000		21	100%	19.9	MBSWGB0326	7.241428571	NP	8.767455
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)													
Acenaphthene	L	520			990		21	0%	ND	N/A	0.005959524	NP	0.005973
Acenaphthylene	L						21	0%	ND	N/A	0.005959524	NP	0.005973
Anthracene	L				40,000		21	0%	ND	N/A	0.005959524	NP	0.005973
Benzo[a]anthracene	H, C				0.018		21	0%	ND	N/A	0.002383333	Normal	0.002388
Benzo[b&k]fluoranthene	H, C				0.018		21	5%	0.00806	MBSWGB0309	0.002654048	NP	0.003165
Benzo[a]pyrene	H, C				0.018	0.2	21	5%	0.00239	MBSWGB0301	0.00124881	NP	0.001357
Benzo[g,h,i]perylene	H, C						21	0%	ND	N/A	0.005959524	NP	0.005973
Chrysene	H, C				0.018		21	5%	0.0121	MBSWGB0309	0.002846429	NP	0.003722
Dibenzo[a,h]anthracene	H, C				0.018		21	0%	ND	N/A	0.002719048	NP	0.006366
Fluoranthene	H		54		140		21	19%	0.0783	MBSWGB0309	0.00727119	NP	0.04377
Fluorene	L				5300		21	5%	0.0125	MBSWGB0309	0.006271429	NP	0.006861
Indeno[1,2,3-cd]pyrene	H, C				0.018		21	0%	ND	N/A	0.00272119	NP	0.006374
Naphthalene	L	620					21	0%	ND	N/A	0.007328333	Max	0.024
Phenanthrene	L						21	5%	0.116	MBSWGB0309	0.0112	NP	0.034041
Pyrene	H				4,000		21	33%	2.58	MBSWGB0324	0.12686	NP	1.347524
Total LPAHs							21	5%	0.1285	MBSWGB0309	0.023691548	NP	0.031932
Total HPAHs							21	43%	2.58	MBSWGB0324	0.140085238	NP	0.093187
Total CPAHs			0.031				21	5%	0.02255	MBSWGB0309	0.010548452	NP	0.033288
Total PAHs							21	43%	2.58	MBSWGB0324	0.154889524	NP	0.159941

Table 3-1b
McCormick and Baxter Creosoting Company
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Fall 2003

Sample ID		MBSWGB0301		MBSWGB0305		MBSWGB0306		MBSWGB0307		MBSWGB0309		MBSWGB0310		MBSWGB0311	
Sample Date		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003	
CONTAMINANT OF INTEREST															
TSS (mg/L)		7.0		6.0		7.0		10.0		89		10.0		6.0	
DOC (mg/L)		1.86		2.06		1.92		1.99		1.93		2.37		1.92	
Pentachlorophenol (ug/L)		0.048	U	0.048	U	0.048	U	0.048	U	0.048	U	0.047	U	0.0474	U
Metals (ug/L)															
Arsenic		**0.956**	**J**	0.005	U	**1.44**		**1.95**		**0.503**	**J**	**1.14**		**1.76**	
Chromium		**1.93**		**2.11**		**2.37**		**1.90**		**2.90**		**2.60**		**2.22**	
Copper		**1.21**		**1.36**		**1.24**		**1.74**		**3.78**		**1.82**		**1.16**	
Zinc		**4.26**		**4.69**		**5.30**		**9.44**		**10.9**		**6.13**		**4.75**	
Polynuclear Aromatic Hydrocarbons (PA															
Acenaphthene	L	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Acenaphthylene	L	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Anthracene	L	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Benzo[a]anthracene	H, C	0.005	U	0.005	U	0.00477	U	0.00477	U	0.00475	U	0.005	U	0.00474	U
Benzo[b&k]fluoranthene	H, C	0.005	U	0.005	U	0.00477	U	0.00477	U	**0.008**	**J**	0.005	U	0.00474	U
Benzo[a]pyrene	H, C	0.002	U	0.002	U	0.00238	U	0.00238	U	**0.002**	**J**	0.002	U	0.00237	U
Benzo[g,h,i]perylene	H, C	0.012	U	0.0121	U	0.0119	U	0.0119	U	0.0119	U	0.012	U	0.0119	U
Chrysene	H, C	0.005	U	0.005	U	0.00477	U	0.00477	U	**0.0121**		0.005	U	0.00474	U
Dibenzo[a,h]anthracene	H, C	0.002	U	0.002	U	0.00238	U	0.00238	U	0.002	U	0.002	U	0.00237	U
Fluoranthene	H	0.002	U	0.002	U	0.00238	U	**0.00307**	**J**	**0.0783**		**0.006**		0.00237	U
Fluorene	L	0.012	U	0.0121	U	0.0119	U	0.0119	U	**0.0125**	**J**	0.012	U	0.0119	U
Indeno[1,2,3-cd]pyrene	H, C	0.002	U	0.002	U	0.00238	U	0.00238	U	0.002	U	0.002	U	0.00237	U
Naphthalene	L	0.024	U	0.024	U	0.0238	U	0.0238	U	0.024	U	0.024	U	0.00237	U
Phenanthrene	L	0.012	U	0.0121	U	0.0119	U	0.0119	U	**0.116**		0.012	U	0.0119	U
Pyrene	H	0.002	U	0.002	U	0.00238	U	**0.00251**	**J**	**0.0529**		0.005	U	0.00237	U
Total LPAHs		0.04195	U	0.0423	U	0.04165	U	0.04165	U	**0.129**		0.04135	U	0.030935	U
Total HPAHs		0.02516	U	0.0254	U	0.0250	U	**0.0056**		**0.154**		**0.006**		0.024935	U
Total CPAHs		0.01677	U	0.016895	U	0.016675	U	0.016675	U	**0.023**		0.01655	U	0.016615	U
Total PAHs		0.06111	U	0.0616	U	0.0607	U	**0.0056**		**0.282**		**0.006**		0.04992	U

Table 3-1b
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water Summary Data
Fall 2003

Sample ID		MBSWGB0312		MBSWGB0314		MBSWGB0315		MBSWGB0316		MBSWGB0317		MBSWGB0318		MBSWGB0321	
Sample Date		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003	
CONTAMINANT OF INTEREST															
TSS (mg/L)		6.0		4.0		5.0		5.0		5.0		5.0		9.0	
DOC (mg/L)		3.33		2.01		2.34		2.27		2.02		2.82		2.21	
Pentachlorophenol (ug/L)		0.0476	U	0.0477	U	0.475	U	0.0476	U	0.0478	U	0.0477	U	0.0475	U
Metals (ug/L)															
Arsenic		0.005	U	0.005	U	0.005	U	**0.968**	**J**	**0.869**	**J**	**0.702**	**J**	**0.543**	**J**
Chromium		**2.28**		**2.37**		**2.13**		**2.29**		**2.35**		**2.36**		**2.25**	
Copper		**1.14**		**1.23**		**21.1**		**1.32**		**1.37**		**6.03**		**2.32**	
Zinc		**4.60**		**6.46**		**14.1**		**4.58**		**6.54**		**7.37**		**4.82**	
Polynuclear Aromatic Hydrocarbons (PA															
Acenaphthene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Acenaphthylene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Anthracene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Benzo[a]anthracene	H, C	0.00476	U	0.00477	U	0.005	U	0.00476	U	0.00478	U	0.00477	U	0.00475	U
Benzo[b&k]fluoranthene	H, C	0.00476	U	0.00477	U	0.005	U	0.00476	U	0.00478	U	0.00477	U	0.00475	U
Benzo[a]pyrene	H, C	0.00238	U	0.00239	U	0.002	U	0.00238	U	0.00239	U	0.00239	U	0.00237	U
Benzo[g,h,i]perylene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U	0.0119	U	0.012	U	0.012	U
Chrysene	H, C	0.00476	U	0.00477	U	0.005	U	0.00476	U	0.00478	U	0.00477	U	0.00475	U
Dibenzo[a,h]anthracene	H, C	0.00238	U	0.00238	U	0.002	U	0.00238	U	0.00239	U	0.0239	U	0.0237	U
Fluoranthene	H	0.00238	U	0.00238	U	0.002	U	0.00238	U	0.00239	U	0.0239	U	0.0237	U
Fluorene	L	0.0119	U	0.0119	U	0.012	U	0.0119	U	0.0119	U	0.0119	U	0.0119	U
Indeno[1,2,3-cd]pyrene	H, C	0.00238	U	0.00238	U	0.002	U	0.0238	U	0.00239	U	0.00239	U	0.00237	U
Naphthalene	L	0.00238	U	0.0238	U	0.024	U	0.00238	U	0.0239	U	0.00239	U	0.00237	U
Phenanthrene	L	0.0119	U	0.0119	U	0.012	U	0.0119	U	0.0119	U	0.0119	U	0.0119	U
Pyrene	H	0.00238	U	0.00238	U	0.002	U	0.00238	U	0.00239	U	0.00239	U	0.00237	U
Total LPAHs		0.03094	U	0.04165	U	0.04165	U	0.03094	U	0.0417	U	0.030945	U	0.030935	U
Total HPAHs		0.02499	U	0.02501	U	0.024975	U	0.0357	U	0.025045	U	0.04654	U	0.04628	U
Total CPAHs		0.01666	U	0.01668	U	0.016645	U	0.02737	U	0.016705	U	0.027445	U	0.027295	U
Total PAHs		0.04998	U	0.06071	U	0.060675	U	0.06069	U	0.060795	U	0.071535	U	0.071265	U

Table 3-1b
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water Summary Data
Fall 2003

Sample ID		MBSWGB0322		MBSWGB0323		MBSWGB0324		MBSWGB0325		MBSWGB0326		MBSWGB0327		MBSWGB0328	
Sample Date		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003		10/16/2003	
CONTAMINANT OF INTEREST															
TSS (mg/L)		10		14		6.0		56.0		180		24.0		5.0	
DOC (mg/L)		2.15		1.99		2.13		2.44		2.16		2.22		2.47	
Pentachlorophenol (ug/L)		0.048	U	0.048	U	0.0475	U	0.0479	U	0.0476	U	0.0475	U	0.0473	U
Metals (ug/L)															
Arsenic		**1.12**		**1.07**		**0.793**	**J**	**1.15**		**2.06**		**1.16**		**1.81**	
Chromium		**2.14**		**1.72**		**2.32**		**2.69**		**5.47**		**1.91**		**2.30**	
Copper		**1.40**		**1.32**		**1.13**		**3.58**		**9.06**		**1.69**		**8.18**	
Zinc		**4.79**		**4.32**		**5.76**		**10.2**		**19.9**		**5.75**		**7.41**	
Polynuclear Aromatic Hydrocarbons (PA															
Acenaphthene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Acenaphthylene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Anthracene	L	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U	0.012	U
Benzo[a]anthracene	H, C	0.005	U	0.005	U	0.00475	U	0.005	U	0.00476	U	0.00476	U	0.005	U
Benzo[b&k]fluoranthene	H, C	0.005	U	0.005	U	0.00475	U	0.005	U	0.00476	U	0.00476	U	0.005	U
Benzo[a]pyrene	H, C	0.002	U	0.002	U	0.00237	U	0.002	U	0.00238	U	0.00238	U	0.002	U
Benzo[g,h,i]perylene	H, C	0.012	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Chrysene	H, C	0.005	U	0.005	U	0.00475	U	0.005	U	0.00476	U	0.00476	U	0.005	U
Dibenzo[a,h]anthracene	H, C	0.002	U	0.002	U	0.0237	U	0.002	U	0.00238	U	0.00238	U	0.002	U
Fluoranthene	H	0.002	U	0.002	U	0.0237	U	0.002	U	**0.00264**	**J**	0.00238	U	0.024	U
Fluorene	L	0.012	U	0.012	U	0.0119	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Indeno[1,2,3-cd]pyrene	H, C	0.002	U	0.002	U	0.00237	U	0.002	U	0.0238	U	0.0238	U	0.002	U
Naphthalene	L	0.024	U	0.024	U	0.00237	U	0.024	U	0.00238	U	0.00238	U	0.002	U
Phenanthrene	L	0.012	U	0.012	U	0.0119	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Pyrene	H	0.002	U	**0.003**	**J**	**2.58**	**J**	**0.002**	**J**	**0.00284**	**J**	**0.0025**	**J**	0.002	U
Total LPAHs		0.042	U	0.042	U	0.030935	U	0.04195	U	0.03094	U	0.03094	U	0.030685	U
Total HPAHs		0.0025	U	**0.003**		**2.58**		**0.002**		**0.00548**		**0.0025**		0.035485	U
Total CPAHs		0.0168	U	0.0168	U	0.027295	U	0.01677	U	0.02737	U	0.02737	U	0.01655	U
Total PAHs		0.0025	U	**0.003**		**2.58**		**0.002**		**0.00548**		**0.0025**		0.06027	U

Table 3-1b
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water Summary Table Notes and Key
Fall 2003

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

KEY:
C = Carcinogenic PAH
Gamma = Gamma Distribution
H = High Molecular Weight PAH (HPAH)
J = Estimated Value
L = Low Molecular Weight PAH (LPAH)
MDL = Method Detection Limit.
mg/L = milligrams per liter
MRL = Method Reporting Limit.
N/A= Not Applicable
ND = Not Detected
NP = Nonparametric Distribution
U = Value Below MDL (value represents MDL)
ug/L = micrograms per liter

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION	Sediment Cap Performance Goals		Comparison Criteria			Surface Water Statistics							Sub-Armoring Water Statistics						
SAMPLE TYPE Sample ID Sample Date Sample Collected By:	McCormick & Baxter Record of Descision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Number of Samples	Detection of Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection of Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
CONTAMINANT OF INTEREST	Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]														
Dissolved Organic Carbon mg/L						26	88%	10.9	MBSWGB05-12	2.78	NP	5.36							
Total Suspended Solids mg/L						26	92%	17	MBSWGB05-2A	5.93	Gamma	7.30							
Total Metals (mg/L)																			
Arsenic	0.19		0.15	0.00014	0.01	26	100%	0.00142	MBSWGB05-04	0.00076	Gamma	0.00083	23	100%	0.0332	MBPWPR05-26	0.005318435	Gamma	0.008372
Chromium	0.21		0.074		0.1	26	0%	ND	NA	0.00038	NP	0.00042	23	39%	0.0144	MBPWPR05-09	0.001423913	NP	0.0041061
Copper	0.012		0.009			26	81%	0.00283	MBSWGB05-32 (Dup. of Sample 17)	0.00099	NP	0.00116	23	70%	0.0282	MBPWPR05-09	0.002666435	NP	0.0146253
Zinc	0.11		0.12	26		26	88%	0.00843	MBSWGB05-32 (Dup. of Sample 17)	0.00314	NP	0.00461	23	100%	0.113	MBPWPR05-09	0.020175652	Gamma	0.0279904
Dissolved Metals (mg/L)																			
Arsenic						26	46%	0.000978	MBSWGB05-18	0.00042	NP	0.00064	23	100%	0.043	MBPWPR05-26	0.005645304	Lognormal	0.010915
Chromium						26	0%	ND	NA	0.00036	NA	NA	23	0%	ND	NA	0.00036	NA	NA
Copper						26	81%	0.0112	MBSWGB05-13	0.00141	NP	0.00315	23	17%	0.0014	MBPWPR05-19	0.000548522	NP	0.000678
Zinc						26	85%	0.00979	MBSWGB05-13	0.00364	Gamma	0.00459	23	96%	0.0249	MBPWPR05-05	0.00680913	Gamma	0.009245
Pentachlorophenol (ug/L)	13		11	3	1	26	0%	ND	NA	0.17446	NP	0.28656	23	4%	0.469	MBPWPR05-17 1	0.85623913	Max	0.469
Polynuclear Aromatic Compounds (µg/L)																			
Acenaphthene L	520		990			26	19%	0.0972	MBSWGB05-17	0.01683	NP	0.03562	23	57%	131	MBPWPR05-20	16.9834587	NP	32.649943
Acenaphthylene L						26	0%	ND	NA	0.00873	NP	0.01433	23	13%	1.22	MBPWPR05-23	0.115984783	NP	0.6744157
Anthracene L			40,000			26	0%	ND	NA	0.00873	NP	0.01433	23	39%	3.42	MBPWPR05-09	0.534873913	NP	2.8762402
Benzo (a) anthracene H, C			0.018			26	0%	ND	NA	0.00873	NP	0.01433	23	17%	0.959	MBPWPR05-09	0.066847826	NP	0.4854613
Benzo (a) pyrene H, C			0.018		0.2	26	0%	ND	NA	0.00873	NP	0.01433	23	4%	0.284	MBPWPR05-09	0.02155	NP	0.0747268
Benzo (b) fluoranthene H, C			0.018			26	0%	ND	NA	0.00873	NP	0.01433	23	9%	0.355	MBPWPR05-09	0.02505	NP	0.1764327
Benzo (ghi) perylene H, C						26	0%	ND	NA	0.00873	NP	0.01433	23	0%	ND	NA	0.014636957	NP	0.039171
Benzo (k) fluoranthene H, C			0.018			26	0%	ND	NA	0.00873	NP	0.01433	23	4%	0.369	MBPWPR05-09	0.025245652	NP	0.182775
Chrysene H, C			0.018			26	0%	ND	NA	0.00873	NP	0.01433	23	22%	1.05	MBPWPR05-09	0.071343478	NP	0.5282518
Dibenzo (a,h) anthracene H, C			0.018			26	0%	ND	NA	0.01745	NP	0.02866	23	0%	ND	NA	0.033684783	NP	0.0855918
Fluoranthene H		54	140			26	0%	ND	NA	0.00873	NP	0.01433	23	61%	7.4	MBPWPR05-07	0.885326087	NP	5.259066
Fluorene L			5300			26	8%	0.0234	MBSWGB05-17	0.00978	NP	0.01594	23	61%	53.9	MBPWPR05-20	5.860819565	NP	11.587413
Indeno (1,2,3-cd) pyrene H, C			0.018			26	0%	ND	NA	0.00873	NP	0.01433	23	0%	ND	NA	0.014636957	NP	0.039171
Naphthalene L	620					26	15%	0.911	MBSWGB05-17	0.06625	NP	0.04442	23	61%	772	MBPWPR05-09	74.56662826	NP	521.8865
Phenanthrene L						26	4%	0.0129	MBSWGB05-17	0.00899	Max	0.01290	23	61%	41	MBPWPR05-20	4.795532609	NP	8.90184
Pyrene H			4,000			26	0%	ND	NA	0.00873	NP	0.01433	23	65%	4.49	MBPWPR05-09	0.521636957	NP	3.1896572
Total LPAHs						26	19%	1.0445	MBSWGB05-17	0.09312	NP	0.51956	23	78%	885.57	MBPWPR05-10	102.7673065	NP	545.396
Total HPAHs						26	4%	0.0132	MBSWGB05-32 (Dup. of Sample 17)	0.04413	Max	0.01320	23	65%	14.257	MBPWPR05-09	1.580665217	NP	9.6073952
Total Carcinogenic PAHs		0.031				26	0%	ND	NA	0.04136	NP	0.06660	23	22%	3.017	MBPWPR05-09	0.21563587	NP	1.5174065
Total PAHs						26	19%	1.0445	NA	0.14138	NP	0.32303	23	78%	885.78	MBPWPR05-10	104.3363837	NP	551.0207

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION		Location 1		Location 2				Location 3						Location 4				Location 5			
SAMPLE TYPE		Surface Water		Surface Water		Surface Water		Sub-Armoring Water	Surface Water		Sub-Armoring Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water	Surface Water		Sub-Armoring Water	
Sample ID		MBSWGB05-01		MBSWGB05-2A		MBSWGB05-2A		MBPWPR05-2B	MBSWGB05-03		MBPWPR05-03		MBPWPR05-31 Duplicate of MBPWPR05-03		MBSWGB05-04		MBPWPR05-04	MBSWGB05-05		MBPWPR05-05	
Sample Date		9/19/2005		9/19/2005		10/13/2005		10/14/2005	10/13/2005		10/13/2005		10/13/2005		10/10/2005		10/12/2005	10/10/2005		10/12/2005	
Sample Collected By:		OSU		OSU		E & E			E & E						OSU			OSU			
CONTAMINANT OF INTEREST																					
Dissolved Organic Carbon mg/L		1.08		1.25		1.29	U		1.29	U					2.05			1.74			
Total Suspended Solids mg/L		5.00	J	3.00	J	17.0			10.00						2.17	U		3.00	J		
Total Metals (mg/L)																					
Arsenic		0.000804		0.00121		0.000678	J	0.000867	J	0.000611	J	0.000974	J	0.000872	J	0.00142		0.0037		0.000598	J	0.00634	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00105		0.00072	U	0.00106		0.000957	J	0.00072	U	0.00194		0.00072	U	0.00072	U
Copper		0.00121	J	0.00133	J	0.00159	J	0.00222		0.000788	U	0.00183	J	0.00174	J	0.000954	J	0.00224		0.00114	J	0.000788	U
Zinc		0.00292	J	0.0015	U	0.00403	J	0.00988		0.00216	J	0.0155		0.0138		0.00229	J	0.0364		0.00268	J	0.0286	
Dissolved Metals (mg/L)																					
Arsenic		0.000783	J	0.00042	U	0.00045	J	0.00064	J	0.000696	J	0.00103		0.00042	U	0.00042	U	0.00315		0.00055	J	0.00592	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		0.000814	J	0.00087	J	0.000788	U	0.00133	J	0.000825	J	0.00106	J	0.00108	J	0.00159	J	0.000788	U	0.00166	J	0.000788	U
Zinc		0.0015	U	0.0015	U	0.00214	J	0.00494	J	0.00209	J	0.00354	J	0.00275	J	0.00362	J	0.018		0.00226	J	0.0249	
Pentachlorophenol (ug/L)		0.952	U	0.952	U	0.245	U	0.24	U	0.243	U	0.246	U	0.245	U	0.239	U	0.238	U	0.238	U	0.238	U
Polynuclear Aromatic Compounds (µg/L)																					
Acenaphthene	L	0.0476	U	0.0476	U	0.0140		0.0120	U	0.0121	U	0.0123	U	0.0123	U	0.0141	J	0.217		0.0527		0.141	
Acenaphthylene	L	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Anthracene	L	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.012	U	0.0262		0.0119	U	0.0119	U
Benzo (a) anthracene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Benzo (a) pyrene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0616	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Benzo (b) fluoranthene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0616	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Benzo (ghi) perylene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0616	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Benzo (k) fluoranthene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0616	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Chrysene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Dibenzo (a,h) anthracene	H, C	0.0952	U	0.0952	U	0.0245	U	0.012	U	0.0243	U	0.123	U	0.0245	U	0.0239	U	0.0238	U	0.0238	U	0.0238	U
Fluoranthene	H	0.0476	U	0.0476	U	0.0123	U	0.024	U	0.0121	U	0.0187	J	0.016	J	0.012	U	0.127		0.0119	U	0.0119	U
Fluorene	L	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.012	U	0.134		0.016	J	0.0278	
Indeno (1,2,3-cd) pyrene	H, C	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0616	U	0.0123	U	0.012	U	0.0119	U	0.0119	U	0.0119	U
Naphthalene	L	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0123	U	0.0836		0.0455		0.455		67.9	
Phenanthrene	L	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0355		0.0123	U	0.012	U	0.158		0.0119	U	0.0182	J
Pyrene	H	0.0476	U	0.0476	U	0.0123	U	0.012	U	0.0121	U	0.0123	U	0.0137	J	0.012	U	0.0772		0.0119	U	0.0119	U
Total LPAHs		0.1428	U	0.1428	U	0.014		0.036	U	0.0363	U	0.0355		0.0369	U	0.0977		0.5807		0.5237		68.087	
Total HPAHs		0.238	U	0.238	U	0.06145	U	0.066	U	0.06055	U	0.0187		0.0297		0.05995	U	0.2042		0.0595	U	0.06545	U
Total Carcinogenic PAHs		0.2142	U	0.2142	U	0.0553	U	0.048	U	0.0545	U	0.2278	U	0.0553	U	0.05395	U	0.05355	U	0.05355	U	0.05355	U
Total PAHs		0.3808	U	0.3808	U	0.07545		0.102	U	0.09685	U	0.0542		0.0297		0.15765		0.7849		0.5832		68.087	

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION		Location 6				Location 7				Location 8				Location 9				Location 10					
SAMPLE TYPE		Surface Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Sub-Armoring Water	
Sample ID		MBSWGB05-06		MBPWPR05-06		MBSWGB05-07		MBPWPR05-07		MBSWGB05-08		MBPWPR05-08		MBSWGB05-09		MBPWPR05-09		MBSWGB05-10		MBPWPR05-10		MBPWPR05-30 Duplicate of MBPWPR05-10	
Sample Date		9/19/2005		10/12/2005		9/19/2005		10/12/2005		10/10/2005		10/12/2005		10/10/2005		10/11/2005		10/10/2005		10/11/2005		10/11/2005	
Sample Collected By:		OSU				OSU				OSU				OSU				OSU					
CONTAMINANT OF INTEREST																							
Dissolved Organic Carbon mg/L		1.15				1.06				1.50				1.53				1.72					
Total Suspended Solids mg/L		5.00	J			9.00	J			9.00	J			6.00	J			6.00	J				
Total Metals (mg/L)																							
Arsenic		0.000852	J	0.00513		0.000582	J	0.00168		0.00075	J	0.0012		0.000789	J	0.0321		0.000702	J	0.00562		0.0056	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00113		0.00072	U	0.0144		0.00072	U	0.00072	U	0.00072	U
Copper		0.00122	J	0.000788	U	0.000984	J	0.000788	U	0.00104	J	0.00209		0.000981	J	0.0282		0.00106	J	0.000788	U	0.000788	U
Zinc		0.0015	U	0.0122		0.0015	U	0.0113		0.00335	J	0.0224		0.00318	J	0.113		0.00282	J	0.0211		0.0181	
Dissolved Metals (mg/L)																							
Arsenic		0.00042	U	0.00512		0.00042	U	0.00163		0.00042	U	0.00085	J	0.00042	U	0.0292		0.00042	U	0.00546		0.00587	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		0.000809	J	0.000788	U	0.000865	J	0.000788	U	0.00108	J	0.000788	U	0.00092	J	0.000788	U	0.00157	J	0.000788	U	0.000788	U
Zinc		0.0015	U	0.00825		0.0015	U	0.00863		0.00496	J	0.00293	J	0.00456	J	0.00189	J	0.0041	J	0.0184		0.0176	
Pentachlorophenol (ug/L)		0.952	U	0.238	U	0.952	U	0.238	U	0.236	U	0.242	U	0.236	U	5	U	0.239	U	2.39	U	2.43	U
Polynuclear Aromatic Compounds (µg/L)																							
Acenaphthene	L	0.0476	U	0.115		0.0476	U	13.4		0.0118	U	0.0121	U	0.0118	U	38.6		0.012	U	114		97	
Acenaphthylene	L	0.0476	U	0.0119	U	0.0476	U	0.176		0.0118	U	0.0121	U	0.0118	U	0.5	U	0.012	U	0.718	U	0.728	U
Anthracene	L	0.0476	U	0.0674		0.0476	U	3.15		0.0118	U	0.0121	U	0.0118	U	3.42		0.012	U	1.07		1.05	
Benzo (a) anthracene	H, C	0.0476	U	0.0119	U	0.0476	U	0.111		0.0118	U	0.0121	U	0.0118	U	0.959		0.012	U	0.12	U	0.121	U
Benzo (a) pyrene	H, C	0.0476	U	0.0119	U	0.0476	U	0.0119	U	0.0118	U	0.0121	U	0.0118	U	0.284	J	0.012	U	0.12	U	0.121	U
Benzo (b) fluoranthene	H, C	0.0476	U	0.0119	U	0.0476	U	0.0119	U	0.0118	U	0.0121	U	0.0118	U	0.355	J	0.012	U	0.12	U	0.121	U
Benzo (ghi) perylene	H, C	0.0476	U	0.0119	U	0.0476	U	0.0119	U	0.0118	U	0.0121	U	0.0118	U	0.25	U	0.012	U	0.12	U	0.121	U
Benzo (k) fluoranthene	H, C	0.0476	U	0.0119	U	0.0476	U	0.0119	U	0.0118	U	0.0121	U	0.0118	U	0.369	J	0.012	U	0.12	U	0.121	U
Chrysene	H, C	0.0476	U	0.0119	U	0.0476	U	0.094		0.0118	U	0.0121	U	0.0118	U	1.05		0.012	U	0.12	U	0.121	U
Dibenzo (a,h) anthracene	H, C	0.0952	U	0.0238	U	0.0952	U	0.0238	U	0.0236	U	0.0242	U	0.0236	U	0.5	U	0.0239	U	0.239	U	0.243	U
Fluoranthene	H	0.0476	U	0.184		0.0476	U	7.4		0.0118	U	0.0244		0.0118	U	6.75		0.012	U	0.21	J	0.242	J
Fluorene	L	0.0476	U	0.0834		0.0476	U	0.273		0.0118	U	0.0121	U	0.0118	U	19.1		0.012	U	24.4		19.3	
Indeno (1,2,3-cd) pyrene	H, C	0.0476	U	0.0119	U	0.0476	U	0.0119	U	0.0118	U	0.0121	U	0.0118	U	0.25	U	0.012	U	0.12	U	0.121	U
Naphthalene	L	0.0476	U	0.0245		0.0476	U	36.5		0.0118	U	0.0483	U	0.0118	U	772		0.012	U	736		654	
Phenanthrene	L	0.0476	U	0.149		0.0476	U	3.78		0.0118	U	0.0275		0.0118	U	22.9		0.012	U	10.1		9.88	
Pyrene	H	0.0476	U	0.109		0.0476	U	4.2		0.0118	U	0.0156	J	0.0118	U	4.49		0.012	U	0.12	U	0.124	
Total LPAHs		0.1428	U	0.4393		0.1428	U	57.297		0.0354	U	0.0275		0.0354	U	856.02		0.036	U	885.57		781.23	
Total HPAHs		0.238	U	0.293		0.238	U	11.805		0.059	U	0.04		0.059	U	14.257		0.05995	U	0.21		0.366	
Total Carcinogenic PAHs		0.2142	U	0.05355	U	0.2142	U	0.205		0.0531	U	0.05445	U	0.0531	U	3.017		0.05395	U	0.5395	U	0.545	U
Total PAHs		0.3808	U	0.7323		0.3808	U	69.102		0.0944	U	0.0675		0.0944	U	870.277		0.09595	U	885.78		781.596	

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION		Location 11				Location 12						Location 13						Location 14				Location 15	
SAMPLE TYPE		Surface Water		Sub-Armoring Water		Surface Water		Surface Water		Sub-Armoring Water		Surface Water		Surface Water		Sub-Amoring Water		Surface Water		Sub-Armoring Water		Surface Water	
Sample ID		MBSWGB05-11		MBPWPR05-11		MBSWGB05-12		MBSWGB05-12		MBPWPR05-12		MBSWGB05-13		MBSWGB05-13		MBPWPR05-13		MBSWGB05-14		MBPWPR05-14		MBSWGB05-15	
Sample Date		10/10/2005		10/11/2005		10/10/2005		10/10/2005		10/10/2005		10/10/2005		10/10/2005		10/10/2005		10/10/2005		10/11/2005		10/10/2005	
Sample Collected By:		OSU				OSU		E & E				OSU		E & E				OSU				OSU	
CONTAMINANT OF INTEREST																							
Dissolved Organic Carbon mg/L		1.72				1.84		10.9				1.75		1.68	J			1.73				1.54	
Total Suspended Solids mg/L		5.00	J			3.00	J	4.00	J			7.00	J	5.00	J			7.00	J			5.00	J
Total Metals (mg/L)																							
Arsenic		**0.0009**	J	**0.00067**	J	**0.000739**	J	**0.00048**	J	**0.00155**		**0.00089**	J	**0.00053**	J	**0.00399**		**0.000871**	J	**0.00303**		**0.000778**	J
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	**0.0011**		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		**0.000967**	J	**0.00113**	J	**0.000963**	J	**0.0009**	J	**0.00171**	J	**0.000924**	J	**0.00087**	J	0.000788	U	**0.00106**	J	**0.00079**	J	**0.00102**	J
Zinc		**0.00302**	J	**0.00429**	J	**0.00388**	J	**0.00266**	J	**0.0134**		**0.00368**	J	**0.00316**	J	**0.00241**	J	**0.00251**	J	**0.0116**		**0.00245**	J
Dissolved Metals (mg/L)																							
Arsenic		**0.00057**	J	**0.0006**	J	0.00042	U	**0.000753**	J	**0.0018**		0.00042	U	**0.000823**	J	**0.00453**		0.00042	U	**0.00369**		0.00042	U
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		0.00144	J	0.000788	U	**0.00148**	J	0.000788	U	0.000788	U	**0.0112**		0.000788	U	0.000788	U	**0.00151**	J	0.000788	U	**0.001**	J
Zinc		**0.0045**	J	**0.00434**	J	**0.00402**	J	**0.0025**	J	**0.00548**		**0.00453**	J	**0.00979**		**0.00252**	J	**0.00495**	J	**0.0114**		**0.00972**	
Pentachlorophenol (ug/L)		0.238	U	0.244	U	0.238	U	0.24	U	0.242	U	0.239	U	0.239	U	0.24	U	0.238	U	0.245	U	0.236	U
Polynuclear Aromatic Compounds (µg/L)																							
Acenaphthene	L	0.0119	U	**0.0495**		0.0119	U	**0.0628**		0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	**1.17**		0.0118	U
Acenaphthylene	L	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0245	U	0.0118	U
Anthracene	L	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	**0.0192**	J	0.0118	U
Benzo (a) anthracene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Benzo (a) pyrene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Benzo (b) fluoranthene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Benzo (ghi) perylene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Benzo (k) fluoranthene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Chrysene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Dibenzo (a,h) anthracene	H, C	0.0238	U	0.0244	U	0.0238	U	0.024	U	0.0242	U	0.0239	U	0.0239	U	0.024	U	0.0238	U	0.0245	U	0.0236	U
Fluoranthene	H	0.0119	U	**0.0571**		0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Fluorene	L	0.0119	U	**0.0176**	J	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	**0.151**		0.0118	U
Indeno (1,2,3-cd) pyrene	H, C	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Naphthalene	L	0.0119	U	0.0122	U	0.0119	U	**0.0700**		0.0121	U	0.012	U	0.012	U	**0.107**		0.0119	U	**0.505**		0.0118	U
Phenanthrene	L	0.0119	U	0.0122	U	0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	**0.117**		0.0118	U
Pyrene	H	0.0119	U	**0.029**		0.0119	U	0.012	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.0119	U	0.0123	U	0.0118	U
Total LPAHs		0.0357	U	**0.0671**		0.0357	U	**0.1328**		0.0363	U	0.036	U	0.036	U	**0.107**		0.0357	U	**1.9622**		0.0354	U
Total HPAHs		0.0595	U	**0.0571**		0.0595	U	0.06	U	0.06655	U	0.05995	U	0.05995	U	0.066	U	0.0595	U	0.0676	U	0.059	U
Total Carcinogenic PAHs		0.05355	U	0.0549	U	0.05355	U	0.054	U	0.05445	U	0.05395	U	0.05395	U	0.054	U	0.05355	U	0.0553	U	0.0531	U
Total PAHs		0.0952	U	**0.1242**		0.0952	U	**0.1928**		0.10285	U	0.09595	U	0.09595	U	**0.107**		0.0952	U	**1.9622**		0.0944	U

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION		Location 16		Location 17				Location 18				Location 19				Location 20					
SAMPLE TYPE		Surface Water		Surface Water		Surface Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Surface Water		Surface Water		Surface Water		Sub-Armoring Water	
Sample ID		MBSWGB05-16		MBSWGB05-17		MBSWGB05-32 (Dup. of Sample 17)		MBPWPR05-17 1		MBSWGB05-18		MBPWPR05-18		MBSWGB05-19		MBPWPR05-19		MBSWGB05-20		MBSWGB05-20A (Dup. of Sample 20)		MBPWPR05-20	
Sample Date		10/10/2005		10/13/2005		10/10/2005		10/13/2005		10/13/2005		10/13/2005		10/13/2005		10/13/2005		10/13/2005		10/10/2005		10/12/2005	
Sample Collected By:		OSU		E & E		E & E				E & E				E & E				OSU		OSU			
CONTAMINANT OF INTEREST																							
Dissolved Organic Carbon mg/L		1.62		2.18		7.19	J			1.94	J			1.29	U			1.73		1.71			
Total Suspended Solids mg/L		3.00	J	8.00	J	13.0				5.00	J			3.00	J			5.00	J	4.00	J		
Total Metals (mg/L)																							
Arsenic		**0.000854**	**J**	**0.000606**	**J**	**0.000945**	**J**	**0.00279**		**0.000735**	**J**	**0.00294**		**0.000634**	**J**	**0.000603**	**J**	**0.000627**	**J**	**0.000569**	**J**	**0.00705**	
Chromium		0.00072	U	0.00072	U	**0.000906**	**J**	**0.00399**		0.00072	U	**0.00166**		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		**0.000913**	**J**	**0.00131**	**J**	**0.00283**		**0.00755**		0.000788	U	**0.00234**		0.000788	U	**0.00106**	**J**	**0.000835**	**J**	**0.001**	**J**	**0.00093**	**J**
Zinc		**0.00252**	**J**	**0.0702**		**0.00843**		**0.0428**		**0.00278**	**J**	**0.0251**		**0.00337**	**J**	**0.00791**		**0.00257**	**J**	**0.0025**	**J**	**0.00509**	
Dissolved Metals (mg/L)																							
Arsenic		0.00042	U	**0.000555**	**J**	**0.000821**	**J**	**0.00235**		**0.000978**	**J**	**0.00313**		0.00042	U	**0.000678**	J	0.00042	U	0.00042	U	**0.00813**	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		**0.00142**	**J**	**0.000885**	**J**	0.000788	U	0.000788	U	**0.000825**	**J**	0.000788	U	**0.00094**	**J**	**0.0014**	**J**	**0.00158**	**J**	**0.00097**	**J**	0.000788	U
Zinc		**0.00495**	**J**	**0.00263**	**J**	**0.00186**	**J**	**0.00519**		**0.00188**	**J**	**0.00451**	**J**	**0.00332**	**J**	**0.0049**	**J**	**0.00421**	**J**	**0.00487**	**J**	0.0015	U
Pentachlorophenol (ug/L)		0.236	U	0.243	U	0.24	U	**0.469**		0.24	U	0.24	U	0.245	U	0.246	U	0.238	U	0.239	U	2.38	U
Polynuclear Aromatic Compounds (µg/L)																							
Acenaphthene	L	0.0118	U	**0.0972**		**0.0792**		0.012	U	0.012	U	**0.0226**	**J**	0.0123	U	0.0123	U	0.0119	U	0.012	U	**131**	
Acenaphthylene	L	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.833	U
Anthracene	L	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	**3.35**	
Benzo (a) anthracene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	**0.243**	
Benzo (a) pyrene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.0119	U
Benzo (b) fluoranthene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.0119	U
Benzo (ghi) perylene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.0119	U
Benzo (k) fluoranthene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.0119	U
Chrysene	H, C	0.0118	U	0.0121	U	0.012	U	**0.0124**	**J**	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	**0.252**	
Dibenzo (a,h) anthracene	H, C	0.0236	U	0.0243	U	0.024	U	0.0239	U	0.024	U	0.024	U	0.0245	U	0.0246	U	0.0238	U	0.0239	U	0.238	U
Fluoranthene	H	0.0118	U	0.0121	U	**0.0132**	**J**	**0.17**		0.012	U	**0.21**		0.0123	U	0.0123	U	0.0119	U	0.012	U	**3.74**	
Fluorene	L	0.0118	U	**0.0234**	**J**	**0.0197**	**J**	**0.0301**		0.012	U	**0.0445**		0.0123	U	0.0123	U	0.0119	U	0.012	U	**53.9**	
Indeno (1,2,3-cd) pyrene	H, C	0.0118	U	0.0121	U	0.012	U	0.012	U	0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	0.0119	U
Naphthalene	L	0.0118	U	**0.911**		**0.814**		**18.9**		0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	**1.57**	
Phenanthrene	L	0.0118	U	**0.0129**	**J**	**0.0123**	**J**	**0.0259**		0.012	U	0.012	U	0.0123	U	0.0123	U	0.0119	U	0.012	U	**41**	
Pyrene	H	0.0118	U	0.0121	U	0.012	U	**0.0152**	**J**	0.012	U	**0.0609**		0.0123	U	0.0123	U	0.0119	U	0.012	U	**2.11**	
Total LPAHs		0.0354	U	**1.0445**		**0.9252**		**18.956**		0.036	U	**0.0671**		0.0369	U	0.0369	U	0.0357	U	0.036	U	**230.82**	
Total HPAHs		0.059	U	0.06055	U	**0.0132**		**0.1976**		0.06	U	**0.2709**		0.06145	U	0.06765	U	0.0595	U	0.05995	U	**6.345**	
Total Carcinogenic PAHs		0.0531	U	0.0545	U	0.054	U	**0.0124**		0.054	U	0.054	U	0.0553	U	0.05535	U	0.05355	U	0.05395	U	**0.495**	
Total PAHs		0.0944	U	**1.10505**		**0.9384**		**19.1536**		0.096	U	**0.338**		0.09835	U	0.10455	U	0.0952	U	0.09595	U	**237.165**	

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Data
Fall 2005

SAMPLE LOCATION		Location 21				Location 22		Location 23				Location 24		Location 25				Location 26	
SAMPLE TYPE		Surface Water		Sub-Armoring Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water		Sub-Armoring Water	
Sample ID		MBSWGB05-21		MBPWPR05-21		MBPWPR05-22		MBSWGB05-23		MBPWPR05-23		MBPWPR05-24		MBSWGB05-25		MBPWPR05-25		MBPWPR05-26	
Sample Date		10/10/2005		10/10/2005		10/13/2005		10/13/2005		10/13/2005		10/13/2005		10/14/2005		10/14/2005		10/14/2005	
Sample Collected By:		E & E						E & E						E & E					
CONTAMINANT OF INTEREST																			
Dissolved Organic Carbon mg/L		9.48	J					3.76	J					10.3					
Total Suspended Solids mg/L		6.00	J					8.00	J					2.17	U				
Total Metals (mg/L)																			
Arsenic		0.00047	J	0.00064	J	0.00049	J	0.000557	J	0.0035		0.00297		0.000725	J	0.00129		0.0332	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00138		0.00072	U	0.00072	U	0.00072	U
Copper		0.000788	U	0.0014	J	0.000788	U	0.000788	U	0.000788	U	0.002		0.00102	J	0.00204		0.00104	J
Zinc		0.00441	J	0.0124		0.0189		0.00774		0.0158		0.0222		0.00278	J	0.00851		0.00325	J
Dissolved Metals (mg/L)																			
Arsenic		0.00063	J	0.000495	J	0.000809	J	0.000425	J	0.00377		0.0024		0.00043	J	0.00105		0.043	
Chromium		0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U	0.00072	U
Copper		0.000788	U	0.000788	U	0.000788	U	0.000947	J	0.000788	U	0.000788	U	0.0008	J	0.00132	J	0.000788	U
Zinc		0.00358	J	0.00445	J	0.0105		0.0047	J	0.00241	J	0.00334	J	0.00202	J	0.00355	J	0.00179	J
Pentachlorophenol (ug/L)		0.239	U	0.244	U	0.24	U	0.24	U	24.3	U	0.24	U	0.238	U	0.238	U	0.24	U
Polynuclear Aromatic Compounds (µg/L)																			
Acenaphthene	L	0.012	U	0.0122	U	0.012	U	0.012	U	76.6		0.544		0.0119	U	0.0119	U	14.7	
Acenaphthylene	L	0.012	U	0.0122	U	0.012	U	0.012	U	1.22	J	0.0185	J	0.0119	U	0.0119	U	0.24	U
Anthracene	L	0.012	U	0.0122	U	0.012	U	0.012	U	1.21	U	0.0258		0.0119	U	0.0119	U	0.49	
Benzo (a) anthracene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.0554	
Benzo (a) pyrene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Benzo (b) fluoranthene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.0155	J
Benzo (ghi) perylene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Benzo (k) fluoranthene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Chrysene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.0694	
Dibenzo (a,h) anthracene	H, C	0.0239	U	0.0244	U	0.024	U	0.024	U	0.0243	U	0.024	U	0.0238	U	0.0238	U	0.024	U
Fluoranthene	H	0.012	U	0.0122	U	0.0379		0.012	U	0.0121	U	0.221		0.0119	U	0.0119	U	1.12	
Fluorene	L	0.012	U	0.0122	U	0.012	U	0.012	U	29		0.173		0.0119	U	0.0119	U	7.41	
Indeno (1,2,3-cd) pyrene	H, C	0.012	U	0.0122	U	0.012	U	0.012	U	0.0121	U	0.012	U	0.0119	U	0.0119	U	0.012	U
Naphthalene	L	0.012	U	0.0122	U	0.0184	J	0.012	U	81.3		0.0189	J	0.0119	U	0.0119	U	0.0705	
Phenanthrene	L	0.012	U	0.0122	U	0.012	U	0.012	U	26.1		0.0218	J	0.0119	U	0.0119	U	5.81	
Pyrene	H	0.012	U	0.0122	U	0.0314		0.012	U	0.0231	J	0.0632		0.0119	U	0.0119	U	0.587	
Total LPAHs		0.036	U	0.0366	U	0.0184		0.036	U	214.22		0.802		0.0357	U	0.0357	U	28.4805	
Total HPAHs		0.05995	U	0.0671	U	0.0693		0.06	U	0.0231		0.2842		0.0595	U	0.06545	U	1.8473	
Total Carcinogenic PAHs		0.05395	U	0.0549	U	0.054	U	0.054	U	0.0545	U	0.054	U	0.05355	U	0.05355	U	0.1403	
Total PAHs		0.09595	U	0.1037	U	0.0877		0.096	U	214.2431		1.0862		0.0952	U	0.10115	U	30.3278	

Table 3-1c
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water and Sub-Armoring Water Summary Table Notes and Key
Fall 2005

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

KEY:
AWQC = Aquatic Water Quality Criteria (1996 version)
C = Carcinogenic PAH
Gamma = Gamma Distribution
H = High Molecular Weight PAH (HPAH)
J = Estimated Value
L = Low Molecular Weight PAH (LPAH)
MDL = Method Detection Limit.
mg/L = milligrams per liter
MRL = Method Reporting Limit.
N/A= Not Applicable
ND = Not Detected
NP = Nonparametric Distribution
U = Value Below MDL (value represents MDL)
ug/L = micrograms per liter

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Sediment Cap Performance Goals		Comparison Criteria									
SAMPLE TYPE Sample ID Sample Date Sample Time		McCormick & Baxter Record of Descision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Surface Water Statistics						
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	(fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)													
Arsenic		0.19		0.15	0.00014	0.01	23	22%	0.00233	Location 25	0.00059	NP	0.00106
Chromium		0.21		0.074		0.1	23	74%	0.00455	Location 14	0.00098	NP	0.00363
Copper		0.012		0.009			23	74%	0.01680	Location 18	0.00403	Max	0.01680
Zinc		0.11		0.12	26		23	87%	0.04000	Location 25	0.00806	NP	0.02911
Pentachlorophenol (µg/L)		13		11	3	1	23	0%	ND	NA	0.11974	NP	0.120275
Polyaromatic Hydrocarbons (ug/L)													
Acenaphthene	L	520		990			23	0%	ND	NA	0.00599	NP	0.006018
Acenaphthylene	L						23	0%	ND	NA	0.00599	NP	0.006017
Anthracene	L			40,000			23	0%	ND	NA	0.00599	NP	0.006018
Benzo (a) anthracene	H, C			0.018			23	0%	ND	NA	0.00599	NP	0.006018
Benzo (a) pyrene	H, C			0.018		0.2	23	4%	0.01460	Location 13	0.00637	NP	0.007072
Benzo (b) fluoranthene	H, C			0.018			23	4%	0.01240	Location 13	0.00627	NP	0.006797
Benzo (ghi) perylene	H, C						23	0%	0.00620	Location 12	0.00599	NP	0.006018
Benzo (k) fluoranthene	H, C			0.018			23	4%	0.01190	Location 13	0.00625	NP	0.006734
Chrysene	H, C			0.018			23	9%	0.01950	Location 25	0.00693	NP	0.008168
Dibenzo (a,h) anthracene	H, C			0.018			23	0%	ND	NA	0.01197	NP	0.012028
Fluoranthene	H		54	140			23	9%	0.03960	Location 25	0.00853	NP	0.016247
Fluorene	L			5300			23	0%	ND	NA	0.00599	NP	0.006018
Indeno (1,2,3-cd) pyrene	H, C			0.018			23	0%	ND	NA	0.00599	NP	0.006018
Naphthalene	L	620					23	26%	0.19000	Location 25	0.01734	NP	0.052277
Phenanthrene	L						23	4%	0.01590	Location 13	0.00642	NP	0.007236
Pyrene	H			4,000			23	13%	0.03190	Location 25	0.00815	NP	0.01044
Total LPAHs							23	26%	0.19000	Location 25	0.02690	NP	0.059955
Total HPAHs							23	13%	0.10660	Location 13	0.04042	NP	0.047293
Total CPAHs			0.031				23	9%	0.05300	Location 13	0.02778	NP	0.029832
Total PAHs							23	30%	0.28100	Location 25	0.05819	NP	0.109319

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Inter-Armoring Water Statistics							Sub-Armoring Water Statistics						
SAMPLE TYPE															
Sample ID Sample Date Sample Time		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
CONTAMINANT OF INTEREST															
Total Metals (mg/L)															
Arsenic		23	30%	0.00493	Location 5	0.00120	NP	0.00228	23	91%	0.03700	Location 3	0.01027	Gamma	0.01543
Chromium		23	43%	0.01050	Location 12	0.00078	NP	0.00525	23	78%	0.01690	Location 11	0.00135	Log	0.00268
Copper		23	96%	0.01680	Location 12	0.00256	NP	0.00564	23	70%	0.03520	Location 19	0.00548	Gamma	0.01069
Zinc		23	78%	0.03920	Location 12	0.00691	NP	0.01544	23	87%	0.38800	Location 11	0.03663	Log	0.07179
Pentachlorophenol (µg/L)		22	0%	ND	NA	0.1200455	NP	0.12032	23	4%	1.195	Location 16	0.167087	NP	8.909733
Polyaromatic Hydrocarbons (ug/L)															
Acenaphthene	L	22	32%	3.65	Location 5	0.3207682	NP	2.322804	23	74%	22.1	Location 20	4.5198457	Gamma	11.20129
Acenaphthylene	L	22	5%	0.0736	Location 10	0.0093455	NP	0.022734	23	4%	0.3065	Location 20	0.0270609	NP	0.158195
Anthracene	L	22	5%	0.199	Location 5	0.0147773	NP	0.053016	23	61%	0.709	Location 5	0.1116	NP	0.514485
Benzo (a) anthracene	H, C	22	5%	0.0134	Location 5	0.0063409	NP	0.006975	23	17%	0.0995	Location 5	0.0145522	NP	0.034816
Benzo (a) pyrene	H, C	22	0%	ND	NA	0.0060045	NP	0.006016	23	9%	0.06	Location 16	0.0098783	NP	0.021038
Benzo (b) fluoranthene	H, C	22	0%	ND	NA	0.0060045	NP	0.006016	23	9%	0.0894	Location 5	0.0129674	NP	0.031414
Benzo (ghi) perylene	H, C	22	0%	ND	NA	0.0060045	NP	0.006016	23	0%	ND	NA	0.0086239	NP	0.013042
Benzo (k) fluoranthene	H, C	22	0%	ND	NA	0.0060045	NP	0.006016	23	0%	ND	NA	0.0083652	NP	0.012787
Chrysene	H, C	22	5%	0.0186	Location 5	0.0065773	NP	0.007658	23	22%	0.101	Location 5	0.015763	NP	0.036583
Dibenzo (a,h) anthracene	H, C	22	0%	ND	NA	0.0120045	NP	0.012032	23	0%	ND	NA	0.0167087	NP	0.025511
Fluoranthene	H	22	5%	0.253	Location 5	0.0172318	NP	0.066169	23	65%	1.67	Location 7	0.2262674	NP	1.122491
Fluorene	L	22	9%	1.99	Location 5	0.0981432	NP	0.994723	23	65%	10.5	Location 5	1.1167109	NP	6.479794
Indeno (1,2,3-cd) pyrene	H, C	22	0%	ND	NA	0.0060045	NP	0.006016	23	0%	0.06	Location 16	0.0083652	NP	0.012787
Naphthalene	L	22	50%	1.13	Location 5	0.0850091	NP	0.603658	23	74%	726	Location 16	47.515817	NP	296.5741
Phenanthrene	L	22	14%	1.73	Location 5	0.0861136	NP	0.865104	23	52%	6.91	Location 5	0.6116935	NP	4.179962
Pyrene	H	22	5%	0.138	Location 5	0.0120045	NP	0.038157	23	48%	0.716	Location 7	0.1075065	NP	0.505947
Total LPAHs		22	55%	8.699	Location 5	0.5928773	NP	4.651962	23	87%	738.2	Location 16	52.836324	Max	738.2
Total HPAHs		22	5%	0.423	Location 5	0.053617	NP	0.130289	23	65%	2.4248	Location 7	0.3749207	NP	1.744037
Total CPAHs		22	5%	0.032	Location 5	0.0272466	NP	0.027677	23	22%	0.3217	Location 5	0.0556446	NP	0.127862
Total PAHs		22	55%	9.122	Location 5	0.6271023	NP	4.857888	23	91%	738.2	Location 16	53.11878	Max	738.2

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 1		Location 2						Location 3						Location 4					
SAMPLE TYPE		Surface Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-01		MBSW0506-02		MBFC0506-0202		MBPW0506-02		MBSW0506-03[6]		MBFC0506-03		MBPW0506-03[6]		MBSW0506-04		MBFC0506-0402		MBPW0506-04	
Sample Date		5/18/2006		5/11/2006		5/15/2006		5/11/2006		5/17/2006		5/18/2006		5/17/2006		5/11/2006		5/15/2006		5/11/2006	
Sample Time		10:50		8:57		8:20		9:15		13:10		9:10		13:30		10:20		7:55		10:40	
CONTAMINANT OF INTEREST																					
Total Metals (mg/L)																					
Arsenic		0.00066	U	0.00066	U	0.00066	U	**0.00793**		0.00066	U	0.00066	U	**0.03700**		0.00066	U	0.00066	U	**0.00948**	
Chromium		**0.00092**	J	**0.00039**	J	**0.00089**	J	**0.00078**	J	0.00012	U	0.00012	U	**0.00048**	J	**0.00042**	J	**0.00031**	J	**0.00110**	
Copper		**0.00335**		0.00060	U	**0.00358**		0.00053	U	**0.00076**	J	**0.00119**	J	**0.00200**		0.00054	U	**0.00130**	J	0.00146	U
Zinc		**0.00605**		**0.00144**	J	0.00736	U	**0.05150**		**0.00219**	J	**0.00249**	J	**0.00440**	J	0.00140	J	0.00385	U	**0.02800**	
Pentachlorophenol (µg/L)		0.23800	U	0.23700	U	0.24000	U	0.24500	U	0.23800	U	0.23900	U	0.23800	U	0.24500	U	0.24300	U	0.24300	U
Polyaromatic Hydrocarbons (ug/L)																					
Acenaphthene	L	0.01190	U	0.01180	U	0.01200	U	**1.06000**		0.01190	U	0.01200	U	**0.06710**		0.01230	U	0.01210	U	**0.11400**	
Acenaphthylene	L	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Anthracene	L	0.01190	U	0.01180	U	0.01200	U	**0.31000**		0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Benzo (a) anthracene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Benzo (a) pyrene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Benzo (b) fluoranthene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Benzo (ghi) perylene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Benzo (k) fluoranthene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Chrysene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Dibenzo (a,h) anthracene	H, C	0.02380	U	0.02370	U	0.02400	U	0.02450	U	0.02380	U	0.02390	U	0.02380	U	0.02450	U	0.02430	U	0.02430	U
Fluoranthene	H	0.01190	U	0.01180	U	0.01200	U	**0.02150**	J	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	**0.10200**	
Fluorene	L	0.01190	U	0.01180	U	0.01200	U	**0.13900**		0.01190	U	0.01200	U	**0.02020**		0.01230	U	0.01210	U	**0.05070**	
Indeno (1,2,3-cd) pyrene	H, C	0.01190	U	0.01180	U	0.01200	U	0.01230	U	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Naphthalene	L	0.01190	U	0.01180	U	**0.01420**	J	**0.02920**		**0.02330**		0.01200	U	**0.03810**		0.01230	U	**0.02070**	J	**0.01360**	J
Phenanthrene	L	0.01190	U	0.01180	U	0.01200	U	**0.14100**		0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	0.01210	U
Pyrene	H	0.01190	U	0.01180	U	0.01200	U	**0.02010**	J	0.01190	U	0.01200	U	0.01190	U	0.01230	U	0.01210	U	**0.05490**	
Total LPAHs		0.03570	U	0.03540	U	**0.01420**	J	**1.67920**	J	**0.02330**		0.03600	U	**0.12540**		0.03690	U	**0.02070**	J	**0.17830**	
Total HPAHs		0.07140	U	0.07085	U	0.07200	U	**0.04160**	J	0.07140	U	0.07195	U	0.07140	U	0.07375	U	0.07265	U	**0.15690**	
Total CPAHs		0.05355	U	0.05315	U	0.05400	U	0.05530	U	0.05355	U	0.05395	U	0.05355	U	0.05530	U	0.05450	U	0.05450	U
Total PAHs		0.10115	U	0.10035	U	**0.01420**	J	**0.17208**	J	**0.02330**		0.10195	U	**0.12540**		0.10450	U	**0.02070**	J	**0.33520**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 5						Location 6									
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Sub-Armoring Water	
Sample ID		MBSW0506-05		MBFC0506-05		MBPW0506-05		MBSW0506-06[6]		MBFC0506-06		MBPW0506-06[6,6]		MBSW0506-60 Duplicate		MBPW0506-60 Duplicate	
Sample Date		5/16/2006		5/18/2006		5/16/2006		5/17/2006		5/18/2006		5/17/2006		5/17/2006		5/17/2006	
Sample Time		11:40		8:50		11:50		8:40		8:25		9:10		8:40		9:10	
CONTAMINANT OF INTEREST																	
Total Metals (mg/L)																	
Arsenic		0.00066	U	**0.00493**		**0.01690**		0.00066	U	0.00066	U	**0.00169**		0.00066	U	**0.00184**	
Chromium		0.00012	U	**0.00186**		**0.00156**		**0.00021**	J	0.00012	U	**0.00012**	J	**0.00037**	J	0.00012	U
Copper		**0.00044**	J	**0.00606**		**0.00264**		**0.00136**	J	**0.00148**	J	**0.00032**	J	**0.00137**	J	0.00013	U
Zinc		**0.00147**	J	**0.01790**		**0.02030**		**0.00319**	J	**0.00251**	J	**0.00559**		**0.00425**	J	**0.00340**	J
Pentachlorophenol (µg/L)		0.24000	U	0.23900	U	0.24000	U	0.23900	U	0.23900	U	0.24200	U	0.23800	U	0.23700	U
Polyaromatic Hydrocarbons (ug/L)																	
Acenaphthene	L	0.01200	U	**3.65000**		**20.40000**		0.01200	U	0.01200	U	**8.00000**		0.01190	U	**6.15000**	
Acenaphthylene	L	0.01200	U	0.02390	U	0.06010	U	0.01200	U	0.01200	U	**0.05790**		0.01190	U	**0.03430**	
Anthracene	L	0.01200	U	**0.19900**		**0.70900**		0.01200	U	0.01200	U	**0.02160**		0.01190	U	**0.02800**	
Benzo (a) anthracene	H, C	0.01200	U	**0.01340**	J	**0.09950**		0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Benzo (a) pyrene	H, C	0.01200	U	0.01200	U	**0.03180**		0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Benzo (b) fluoranthene	H, C	0.01200	U	0.01200	U	**0.08940**		0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Benzo (ghi) perylene	H, C	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Benzo (k) fluoranthene	H, C	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Chrysene	H, C	0.01200	U	**0.01860**	J	**0.10100**		0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Dibenzo (a,h) anthracene	H, C	0.02400	U	0.02390	U	0.02400	U	0.02390	U	0.02390	U	0.02420	U	0.02380	U	0.02370	U
Fluoranthene	H	0.01200	U	**0.25300**		**0.93700**		0.01200	U	0.01200	U	**0.01550**		0.01190	U	**0.01670**	
Fluorene	L	0.01200	U	**1.99000**		**10.50000**		0.01200	U	0.01200	U	**0.40400**		0.01190	U	**0.46700**	
Indeno (1,2,3-cd) pyrene	H, C	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Naphthalene	L	0.01200	U	**1.13000**		**3.51000**		0.01200	U	0.01200	U	18.50000	J	0.01190	U	**23.50000**	
Phenanthrene	L	0.01200	U	**1.73000**		**6.91000**		0.01200	U	0.01200	U	**0.12100**		0.01190	U	**0.14700**	
Pyrene	H	0.01200	U	**0.13800**		**0.47200**		0.01200	U	0.01200	U	0.01210	U	0.01190	U	0.01180	U
Total LPAHs		0.03600	U	**8.69900**		**42.02900**		0.03600	U	0.03600	U	**8.60450**		0.03570	U	**30.32630**	
Total HPAHs		0.07200	U	**0.42300**		**1.73070**		0.07195	U	0.07195	U	**0.01550**		0.07140	U	**0.01670**	
Total CPAHs		0.05400	U	**0.03200**		**0.32170**		0.05395	U	0.05395	U	0.05445	U	0.05355	U	0.05315	U
Total PAHs		0.10200	U	**9.12200**		**43.75970**		0.10195	U	0.10195	U	**8.62000**		0.10115	U	**30.34300**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 7						Location 8						Location 9					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-07		MBFC0506-07[6]		MBPW0506-07		MBSW0506-08		MBFC0506-08		MBPW0506-08		MBSW0506-09		MBFC0506-09		MBPW0506-09	
Sample Date		5/16/2006		5/17/2006		5/16/2006		5/15/2006		5/16/2006		5/15/2006		5/15/2006		5/16/2006		5/15/2006	
Sample Time		12:45		10:25		13:15		13:50		10:00		14:35		12:20		8:55		12:40	
CONTAMINANT OF INTEREST																			
Total Metals (mg/L)																			
Arsenic		0.00066	U	**0.00069**	J	**0.00262**		0.00332	U	0.00332	U	0.00332	U	0.00066	U	0.00332	U	**0.00873**	
Chromium		0.00012	U	0.00012	U	0.00012	U	**0.00134**	J	0.00061	U	0.00061	U	**0.00034**	J	0.00061	U	**0.00057**	J
Copper		**0.00044**	J	**0.00137**	J	0.00013	U	**0.00634**	J	**0.00526**	J	**0.00134**		**0.01390**		**0.00113**	J	**0.00890**	
Zinc		**0.00110**	J	**0.00371**	J	**0.00662**		**0.01950**	J	**0.00351**	J	**0.01050**	J	0.00272	U	**0.00814**	J	0.00453	U
Pentachlorophenol (µg/L)		0.24000	U			0.23900	U	0.23800	U	0.24000	U	0.24300	U	0.23700	U	0.23900	U	0.23900	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.01200	U			**17.20000**		0.01190	U	0.01200	U	0.01210	U	0.01180	U	**0.01350**	J	**13.90000**	
Acenaphthylene	L	0.01200	U			0.08370	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	0.04780	U
Anthracene	L	0.01200	U			**0.55200**		0.01190	U	0.01200	U	0.01450	J	0.01180	U	0.01200	U	**0.33000**	
Benzo (a) anthracene	H, C	0.01200	U			**0.01960**	J	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**0.03240**	
Benzo (a) pyrene	H, C	0.01200	U			0.01200	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**0.01500**	J
Benzo (b) fluoranthene	H, C	0.01200	U			0.01200	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**0.02250**	J
Benzo (ghi) perylene	H, C	0.01200	U			0.01200	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	0.01200	U
Benzo (k) fluoranthene	H, C	0.01200	U			0.01200	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	0.01200	U
Chrysene	H, C	0.01200	U			0.01920	J	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**0.04170**	
Dibenzo (a,h) anthracene	H, C	0.02400	U			0.02390	U	0.02380	U	0.02400	U	0.02430	U	0.02370	U	0.02390	U	0.02390	U
Fluoranthene	H	0.01200	U			**1.67000**		0.01190	U	0.01200	U	0.01700	J	0.01180	U	0.01200	U	**0.84700**	
Fluorene	L	0.01200	U			**4.93000**		0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**6.18000**	
Indeno (1,2,3-cd) pyrene	H, C	0.01200	U			0.01200	U	0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	0.01200	U
Naphthalene	L	0.01200	U			**84.30000**		0.01190	U	0.01200	U	0.01210	U	**0.01270**	J	0.01200	U	**6.14000**	
Phenanthrene	L	0.01200	U			**0.29400**		0.01190	U	0.01200	U	0.01210	U	0.01180	U	0.01200	U	**0.83200**	
Pyrene	H	0.01200	U			**0.71600**		0.01190	U	0.01200	U	**0.01280**	J	0.01180	U	0.01200	U	**0.30800**	
Total LPAHs		0.03600	U			**107.27600**		0.03570	U	0.03600	U	**0.01450**		**0.01270**		**0.01350**		**27.38200**	
Total HPAHs		0.07200	U			**2.42480**		0.07140	U	0.07200	U	**0.02980**		0.07085	U	0.07195	U	**1.29050**	
Total CPAHs		0.05400	U			**0.03880**		0.05355	U	0.05400	U	0.05450	U	0.05315	U	0.05395	U	**0.13550**	
Total PAHs		0.10200	U			**109.70080**		0.10115	U	0.10200	U	**0.04430**		**0.01270**		**0.01350**		**28.67250**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 10						Location 11						Location 12					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-10		MBFC0506-10		MBPW0506-10		MBSW0506-11		MBFC0506-11		MBPW0506-11		MBSW0506-12		MBFC0506-12		MBPW0506-12	
Sample Date		5/10/2006		5/12/2006		5/10/2006		5/11/2006		5/12/2006		5/11/2006		5/11/2006		5/12/2006		5/11/2006	
Sample Time		13:15		10:30		13:42		11:55		14:40		12:17		12:55		13:35		13:18	
CONTAMINANT OF INTEREST																			
Total Metals (mg/L)																			
Arsenic		0.00066	U	0.00066	U	**0.00278**		0.00066	U	0.00066	U	**0.00717**		0.00066	U	**0.00345**		**0.03380**	
Chromium		**0.00031**	J	0.00012	U	**0.00013**	J	**0.00028**	J	**0.00034**	J	**0.01690**		**0.00037**	J	**0.01050**		**0.00033**	J
Copper		0.00063	U	**0.00190**	J	0.00024	U	0.00047	U	**0.00103**	J	**0.03010**		0.00104	U	**0.01680**		0.00013	U
Zinc		**0.00122**	J	**0.00222**	J	**0.00909**		**0.00112**	J	0.00272	J	**0.38800**		**0.00253**	J	**0.03920**		**0.02360**	
Pentachlorophenol (µg/L)		0.24400	U	0.24200	U	0.24000	U	0.23900	U	0.24000	U	0.23800	U	0.24800	U	0.24000	U	0.23800	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.01220	U	**2.71000**		**2.34000**		0.01200	U	0.01200	U	**0.05480**		0.01240	U	**0.01770**	J	**0.47400**	
Acenaphthylene	L	0.01220	U	**0.07360**		0.01200	U	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	0.01190	U
Anthracene	L	0.01220	U	0.01210	U	**0.02200**	J	0.01200	U	0.01200	U	**0.01670**	J	0.01240	U	0.01200	U	**0.01960**	J
Benzo (a) anthracene	H, C	0.01220	U	0.01210	U	**0.01480**	J	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	0.01190	U
Benzo (a) pyrene	H, C	0.01220	U	0.01210	U	0.01200	U	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	0.01190	U
Benzo (b) fluoranthene	H, C	0.01220	U	0.01210	U	0.01200	U	0.01200	U	0.01200	U	0.02380	U	0.01240	U	0.01200	U	0.01190	U
Benzo (ghi) perylene	H, C	0.01220	U	0.01210	U	0.01200	U	0.01200	U	0.01200	U	0.02380	U	0.01240	U	0.01200	U	0.01190	U
Benzo (k) fluoranthene	H, C	0.01220	U	0.01210	U	0.01200	U	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	0.01190	U
Chrysene	H, C	0.01220	U	0.01210	U	**0.01790**	J	0.01200	U	0.01200	U	**0.02030**	J	0.01240	U	0.01200	U	0.01190	U
Dibenzo (a,h) anthracene	H, C	0.02440	U	0.02420	U	0.02400	U	0.02390	U	0.02400	U	0.02380	U	0.02480	U	0.02400	U	0.02380	U
Fluoranthene	H	0.01220	U	0.01210	U	**0.64000**		0.01200	U	0.01200	U	**0.05310**		0.01240	U	0.01200	U	**0.02810**	
Fluorene	L	0.01220	U	0.01210	U	**0.04410**		0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	**0.17400**	
Indeno (1,2,3-cd) pyrene	H, C	0.01220	U	0.01210	U	0.01200	U	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	0.01190	U
Naphthalene	L	0.01220	U	**0.05360**		**59.70000**		0.01200	U	0.01200	U	0.03570	U	**0.02150**	J	**0.01260**	J	**0.95200**	
Phenanthrene	L	0.01220	U	**0.03350**		0.01200	U	0.01200	U	0.01200	U	0.01190	U	0.01240	U	0.01200	U	**0.08990**	
Pyrene	H	0.01220	U	0.01210	U	**0.30600**		0.01200	U	0.01200	U	**0.03240**		0.01240	U	0.01200	U	**0.02360**	J
Total LPAHs		0.03660	U	**2.87070**		**62.10610**		0.03600	U	0.03600	U	**0.07150**		**0.02150**		**0.03030**		**1.70950**	
Total HPAHs		0.07320	U	0.07260	U	**0.97870**		0.07195	U	0.07200	U	**0.10580**		0.07440	U	0.07200	U	**0.05170**	
Total CPAHs		0.05490	U	0.05445	U	**0.03270**		0.05395	U	0.05400	U	**0.02030**		0.05580	U	0.05400	U	0.05355	U
Total PAHs		0.10370	U	**2.87070**		**63.08480**		0.10195	U	0.10200	U	**0.17730**		**0.02150**		**0.03030**		**1.76120**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 13								Location 14						Location 15					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-13		MBFC0506-13		MBPW0506-13		MBPW0506-58 Duplicate		MBSW0506-14		MBFC0506-1402		MBPW0506-14		MBSW0506-15		MBFC0506-15		MBPW0506-15	
Sample Date		5/12/2006		5/15/2006		5/12/2006		5/12/2006		5/10/2006		5/11/2006		5/10/2006		5/15/2006		5/16/2006		5/15/2006	
Sample Time		11:40		9:25		12:00		12:00		11:25		14:10		11:50		11:05		8:15		11:40	
CONTAMINANT OF INTEREST																					
Total Metals (mg/L)																					
Arsenic		0.00066	U	**0.00243**		**0.01920**		**0.01530**		**0.00118**		0.00066	U	**0.00842**		**0.00089**	J	0.00332	U	**0.01060**	
Chromium		**0.00053**	J	**0.00069**	J	0.00012	U	0.00012	U	**0.00455**		**0.00048**	J	**0.00094**	J	**0.00343**		0.00061	U	**0.00053**	J
Copper		**0.00207**		**0.00160**	J	**0.00151**	J	**0.00028**	J	**0.00833**		0.00152	U	**0.01580**		**0.00707**		**0.00100**	J	**0.01380**	
Zinc		**0.00670**		0.00774	U	**0.00188**	J	**0.00451**	J	**0.01930**		**0.00363**	J	**0.03620**		**0.02250**		0.00235	U	**0.01890**	
Pentachlorophenol (µg/L)		0.23600	U	0.24000	U	0.24000	U	0.24000	U	0.24000	U	0.24200	U	0.24300	U	0.23800	U	0.24000	U	0.24200	U
Polyaromatic Hydrocarbons (ug/L)																					
Acenaphthene	L	0.01180	U	**0.01400**	J	**0.81800**		**0.69200**		0.01200	U	0.01210	U	**3.08000**		0.01190	U	0.01200	U	**2.06000**	
Acenaphthylene	L	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Anthracene	L	0.01180	U	0.01200	U	**0.01420**	J	**0.01480**	J	0.01200	U	0.01210	U	**0.03210**		0.01190	U	0.01200	U	**0.06820**	
Benzo (a) anthracene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Benzo (a) pyrene	H, C	**0.01460**	J	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Benzo (b) fluoranthene	H, C	**0.01240**	J	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Benzo (ghi) perylene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Benzo (k) fluoranthene	H, C	**0.01190**	J	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Chrysene	H, C	**0.01410**	J	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Dibenzo (a,h) anthracene	H, C	0.02360	U	0.02400	U	0.02400	U	0.02400	U	0.02400	U	0.02420	U	0.02430	U	0.02380	U	0.02400	U	0.02420	U
Fluoranthene	H	**0.03060**		0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	**0.03830**		0.01190	U	0.01200	U	0.01210	U
Fluorene	L	0.01180	U	0.01200	U	**0.59000**		**0.53100**		0.01200	U	0.01210	U	**0.71900**		0.01190	U	0.01200	U	**0.46200**	
Indeno (1,2,3-cd) pyrene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01210	U	0.01190	U	0.01200	U	0.01210	U
Naphthalene	L	**0.03730**		**0.01770**	J	**0.43800**		**0.31700**		0.01200	U	0.01210	U	**0.04090**		**0.01220**	J	0.01200	U	**0.10200**	
Phenanthrene	L	**0.01590**	J	0.01200	U	**0.21800**		**0.22500**		0.01200	U	0.01210	U	**0.22100**		0.01190	U	0.01200	U	**0.05340**	
Pyrene	H	**0.02300**	J	0.01200	U	0.01200	U	0.01200	U	**0.01270**	J	0.01210	U	**0.02180**	J	0.01190	U	0.01200	U	0.01210	U
Total LPAHs		**0.05320**		**0.03170**		**2.07820**		**1.77980**		0.03600	U	0.03630	U	**4.09300**		**0.01220**		0.03600	U	**2.74560**	
Total HPAHs		**0.10660**		0.07200	U	0.07310	U	0.07340	U	**0.01270**		0.07260	U	**0.06010**		0.07140	U	0.07200	U	0.10065	U
Total CPAHs		**0.05300**		0.05400	U	0.05400	U	0.05400	U	0.05400	U	0.05445	U	0.05450	U	0.05355	U	0.05400	U	0.05445	U
Total PAHs		**0.15980**		**0.03170**		**2.07820**		**1.77980**		**0.01270**		0.10285	U	**4.15310**		**0.01220**		0.10200	U	**2.74560**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 16						Location 17						Location 18					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-16[6]		MBFC0506-16		MBPW0506-16[6]		MBSW0506-17		MBFC0506-17[6]		MBPW0506-17		MBSW0506-18		MBFC0506-18		MBPW0506-18	
Sample Date		5/17/2006		5/18/2006		5/17/2006		5/16/2006		5/17/2006		5/16/2006		5/15/2006		5/16/2006		5/15/2006	
Sample Time		7:45		7:40		8:10		11:10		10:50		11:15		13:10		9:30		13:25	
CONTAMINANT OF INTEREST																			
Total Metals (mg/L)																			
Arsenic		0.00066	U	0.00066	U	**0.00580**		**0.00108**		**0.00222**		**0.00125**		0.00066	U	0.00332	U	**0.00237**	
Chromium		**0.00098**	J	**0.00032**	J	0.00012	U	0.00061	U	0.00012	U	**0.00100**		**0.00030**	J	0.00061	U	**0.00031**	J
Copper		**0.00251**		**0.00241**		**0.00029**	J	**0.00457**		**0.00121**	J	**0.00203**		**0.01680**		**0.00308**	J	0.00013	U
Zinc		0.00543		**0.00459**	J	0.02780		**0.01880**		**0.02860**		**0.02080**		0.00257	U	**0.00364**	J	0.00913	U
Pentachlorophenol (µg/L)		0.23800	U	0.24000	U	2.39000	U	0.23700	U	0.24200	U	0.23800	U	0.23900	U	0.23800	U	0.24300	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.01190	U	**0.01370**	J	**12.20000**		0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Acenaphthylene	L	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Anthracene	L	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Benzo (a) anthracene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Benzo (a) pyrene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Benzo (b) fluoranthene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Benzo (ghi) perylene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Benzo (k) fluoranthene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Chrysene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Dibenzo (a,h) anthracene	H, C	0.02380	U	0.02400	U	0.23900	U	0.02370	U	0.02420	U	0.02380	U	0.02390	U	0.02380	U	0.02430	U
Fluoranthene	H	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	**0.01340**	J	0.01200	U	0.01190	U	0.01210	U
Fluorene	L	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	**0.03380**	
Indeno (1,2,3-cd) pyrene	H, C	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Naphthalene	L	0.01190	U	**0.32900**		**726.00000**		0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Phenanthrene	L	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	**0.02310**	J
Pyrene	H	0.01190	U	0.01200	U	0.12000	U	0.01180	U	0.01210	U	0.01190	U	0.01200	U	0.01190	U	0.01210	U
Total LPAHs		0.03570	U	**0.34270**		**738.20000**		0.03540	U	0.03630	U	0.03570	U	0.03600	U	0.03570	U	**0.05690**	
Total HPAHs		0.07140	U	0.07200	U	0.71950	U	0.07085	U	0.07260	U	**0.01340**		0.07195	U	0.07140	U	0.07265	U
Total CPAHs		0.05355	U	0.05400	U	0.53950	U	0.05315	U	0.05445	U	0.05355	U	0.05395	U	0.05355	U	0.05450	U
Total PAHs		0.10115	U	**0.34270**		**738.20000**		0.10035	U	0.10285	U	**0.01340**		0.10195	U	0.10115	U	**0.05690**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 19						Location 20						Location 21					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-19		MBFC0506-19[6]		MBPW0506-19		MBSW0506-20		MBFC0506-20		MBPW0506-20		MBSW0506-21		MBFC0506-21		MBPW0506-21	
Sample Date		5/16/2006		5/17/2006		5/16/2006		5/10/2006		5/12/2006		5/10/2006		5/15/2006		5/16/2006		5/15/2006	
Sample Time		10:30		11:20		10:45		14:14		10:00		14:40		10:00		7:45		10:25	
CONTAMINANT OF INTEREST																			
Total Metals (mg/L)																			
Arsenic		0.00066	U	0.00066	U	**0.00719**		0.00066	U	**0.00121**		**0.02150**		0.00066	U	0.00332	U	**0.02600**	
Chromium		0.00061	U	0.00012	U	**0.00294**	J	**0.00032**	J	0.00012	U	**0.00126**		**0.00235**		0.00061	U	**0.00019**	J
Copper		**0.00702**		**0.00120**	J	**0.03520**		0.00152	U	**0.00088**	J	0.00177	U	**0.00418**		**0.00100**	J	**0.00261**	
Zinc		**0.01180**		**0.00242**	J	**0.09280**		**0.00194**	J	**0.00251**	J	**0.06360**		0.00558	U	**0.00272**	J	0.00924	U
Pentachlorophenol (µg/L)		0.23600	U	0.24000	U	0.23900	U	0.24000	U	0.24300	U	0.24500	U	0.24000	U	0.23800	U	0.24000	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.01180	U	0.01200	U	**0.02880**		0.01200	U	**0.54800**		**22.10000**		0.01200	U	0.01190	U	**0.02370**	J
Acenaphthylene	L	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.61300	U	0.01200	U	0.01190	U	0.01200	U
Anthracene	L	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	**0.30000**		0.01200	U	0.01190	U	**0.04190**	
Benzo (a) anthracene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Benzo (a) pyrene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Benzo (b) fluoranthene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Benzo (ghi) perylene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Benzo (k) fluoranthene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Chrysene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Dibenzo (a,h) anthracene	H, C	0.02360	U	0.02400	U	0.02390	U	0.02400	U	0.02430	U	0.02450	U	0.02400	U	0.02380	U	0.02400	U
Fluoranthene	H	0.01180	U	0.01200	U	**0.01910**	J	0.01200	U	0.01210	U	**0.68400**		0.01200	U	0.01190	U	**0.01490**	J
Fluorene	L	0.01180	U	0.01200	U	**0.01260**	J	0.01200	U	**0.04910**		**1.26000**		0.01200	U	0.01190	U	0.01200	U
Indeno (1,2,3-cd) pyrene	H, C	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	0.01230	U	0.01200	U	0.01190	U	0.01200	U
Naphthalene	L	0.01180	U	0.01200	U	**0.01330**	J	0.01200	U	**0.14900**		**188.00000**		0.01200	U	0.01190	U	**0.02530**	
Phenanthrene	L	0.01180	U	0.01200	U	0.01200	U	0.01200	U	**0.01700**	J	**5.00000**		0.01200	U	0.01190	U	**0.01260**	J
Pyrene	H	0.01180	U	0.01200	U	0.01200	U	0.01200	U	0.01210	U	**0.37900**		0.01200	U	0.01190	U	0.01200	U
Total LPAHs		0.03540	U	0.03600	U	**0.05470**		0.03600	U	**0.76310**		**216.66000**		0.03600	U	0.03570	U	**0.10350**	
Total HPAHs		0.07080	U	0.07200	U	**0.01910**		0.07200	U	0.07265	U	**1.06300**		0.07200	U	0.07140	U	**0.01490**	
Total CPAHs		0.05310	U	0.05400	U	0.05395	U	0.05400	U	0.05450	U	0.05530	U	0.05400	U	0.05355	U	0.05400	U
Total PAHs		0.10030	U	0.10200	U	**0.07380**		0.10200	U	**0.76310**		**217.72300**		0.10200	U	0.10115	U	**0.11840**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 24								Location 25					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW0506-24		MBFC0506-24		MBPW0506-24		MBSW0506-50 Duplicate		MBSW0506-25[6]		MBFC0506-25		MBPW0506-25[6]	
Sample Date		5/12/2006		5/15/2006		5/12/2006		5/12/2006		5/17/2006		5/18/2006		5/17/2006	
Sample Time		8:22		8:55		9:08		8:22		13:55		9:50		14:10	
CONTAMINANT OF INTEREST															
Total Metals (mg/L)															
Arsenic		0.00073	J	0.00066	U	0.00066	U	0.00066	U	0.00233		0.00067	J	0.00254	
Chromium		**0.00304**		**0.00028**	J	0.00012	U	**0.00073**	J	**0.00253**		0.00012	U	**0.00095**	J
Copper		**0.00657**		**0.00147**	J	**0.00119**	J	**0.00165**	J	**0.00709**		**0.00193**	J	**0.00418**	
Zinc		**0.01670**		0.00230	U	**0.00171**	J	**0.00490**	J	**0.04000**		**0.01080**		**0.00715**	
Pentachlorophenol (µg/L)		0.23900	U	0.24000	U	0.24200	U	0.23900	U	0.23800	U	0.24000	U	0.23700	U
Polyaromatic Hydrocarbons (ug/L)															
Acenaphthene	L	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Acenaphthylene	L	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Anthracene	L	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Benzo (a) anthracene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Benzo (a) pyrene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Benzo (b) fluoranthene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Benzo (ghi) perylene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Benzo (k) fluoranthene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Chrysene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01950		0.01200	U	0.01180	U
Dibenzo (a,h) anthracene	H, C	0.02390	U	0.02400	U	0.02420	U	0.02390	U	0.02380	U	0.02400	U	0.02370	U
Fluoranthene	H	0.01200	U	0.01200	U	0.01210	U	0.01200	U	**0.03960**		0.01200	U	0.01180	U
Fluorene	L	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Indeno (1,2,3-cd) pyrene	H, C	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Naphthalene	L	0.01200	U	**0.02020**	J	0.01210	U	0.01200	U	**0.19000**		**0.01210**	J	**0.01340**	
Phenanthrene	L	0.01200	U	0.01200	U	0.01210	U	0.01200	U	0.01190	U	0.01200	U	0.01180	U
Pyrene	H	0.01200	U	0.01200	U	0.01210	U	0.01200	U	**0.03190**		0.01200	U	0.01180	U
Total LPAHs		0.03600	U	**0.02020**		0.03630	U	0.03600	U	**0.19000**		**0.01210**		**0.01340**	
Total HPAHs		0.07195	U	0.07200	U	0.07260	U	0.07195	U	**0.09100**		0.07200	U	0.07085	U
Total CPAHs		0.05395	U	0.05400	U	0.05445	U	0.05395	U	**0.01950**		0.05400	U	0.05315	U
Total PAHs		0.10195	U	**0.02020**		0.10285	U	0.10195	U	**0.28100**		**0.01210**		**0.01340**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2006

SAMPLE LOCATION		Location 26						Location 27					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water					
Sample ID		MBSW0506-26[6]		MBFC0506-26		MBPW0506-26[6]		MBSW0506-27		MBRS0506-BM[9] RINSATE		MBRS0506-HS RINSATE	
Sample Date		5/17/2006		5/18/2006		5/17/2006		5/10/2006		5/19/2006		5/19/2006	
Sample Time		14:30		10:12		14:50		10:30		11:40		11:23	
CONTAMINANT OF INTEREST													
Total Metals (mg/L)													
Arsenic		0.00066	U	0.00066	U	**0.00119**		**0.00340**		0.00066	U	0.00066	U
Chromium		0.00012	U	0.00012	U	**0.00032**	J	**0.01420**		0.00012	U	0.00012	U
Copper		**0.00075**	J	**0.00122**	J	**0.00195**	J	**0.02620**		0.00013	U	0.00013	U
Zinc		**0.00168**	J	**0.00399**	J	**0.00991**		**0.06780**		0.00101	U	0.00727	U
Pentachlorophenol (µg/L)		0.24200	U	0.23800	U	0.24200	U	0.24400	U	0.24300	U	0.24000	U
Polyaromatic Hydrocarbons (ug/L)													
Acenaphthene	L	0.01210	U	0.01190	U	0.01210	U	0.01220	U	**0.04480**		**0.07390**	
Acenaphthylene	L	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Anthracene	L	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Benzo (a) anthracene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Benzo (a) pyrene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Benzo (b) fluoranthene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Benzo (ghi) perylene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Benzo (k) fluoranthene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Chrysene	H, C	0.01210	U	0.01190	U	0.01210	U	**0.01290**	J	0.01210	U	0.01200	U
Dibenzo (a,h) anthracene	H, C	0.02420	U	0.02380	U	0.02420	U	0.02440	U	0.02430	U	0.02400	U
Fluoranthene	H	0.01210	U	0.01190	U	0.01210	U	**0.01970**	J	0.01210	U	0.01200	U
Fluorene	L	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.04280		**0.07210**	
Indeno (1,2,3-cd) pyrene	H, C	0.01210	U	0.01190	U	0.01210	U	0.01220	U	0.01210	U	0.01200	U
Naphthalene	L	0.01210	U	**0.04510**		0.01210	U	0.01220	U	**0.20600**		**0.35900**	
Phenanthrene	L	0.01210	U	0.01190	U	0.01210	U	0.01220	U	**0.01680**	J	**0.02720**	
Pyrene	H	0.01210	U	0.01190	U	0.01210	U	**0.01950**	J	0.01210	U	0.01200	U
Total LPAHs		0.03630	U	**0.04510**		0.03630	U	0.03660	U	**0.31040**		**0.53220**	
Total HPAHs		0.07260	U	0.07140	U	0.07260	U	**0.05210**		0.07265	U	0.07200	U
Total CPAHs		0.05445	U	0.05355	U	0.05445	U	**0.01290**		0.05450	U	0.05400	U
Total PAHs		0.10285	U	**0.04510**		0.10285	U	**0.05210**		**0.31040**		**0.53220**	

Table 3-1d
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Table Notes and Key
Spring 2006

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

[4] Qualified as not detected because analytes were detected in the method blank (value represent the amount detected in sample).

[5] Due to contamination in the method blank, detected PAH's at or near the MRL's in the samples are considered estimated levels only.

[6] Samples were inadvertently left out of refrigerator by Test America; all sample results for PAH's + PCP are estimates only.

[7] Sample ID for laboratory is MBPW0506-58.

[8] Sample ID for laboratory is MBSW0506-50.

[9] Sample surrogate (fluorene-d10) just below control limits at 24.8%.

[10] Results for PCP and Naphthalene for loaction 6 in tables published prior to September 11, 2007 are not correct.

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

KEY:
AWQC = Aquatic Water Quality Criteria (1996 version)
C = Carcinogenic PAH
Gamma = Gamma Distribution
H = High Molecular Weight PAH (HPAH)
HS = Henrey Sampler
J = Estimated Value
L = Low Molecular Weight PAH (LPAH)
MDL = Method Detection Limit.
mg/L = milligrams per liter
MRL = Method Reporting Limit.
N/A= Not Applicable
ND = Not Detected
NP = Nonparametric Distribution
U = Value Below MDL (value represents MDL)
ug/L = micrograms per liter

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Sediment Cap Performance Goals		Comparison Criteria									
SAMPLE TYPE													
Sample ID Sample Date Sample Time		McCormick & Baxter Record of Descision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Surface Water Statistics						
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids							22	95%	20	Location 19	5.69045455	Lognormal	7.270927
Total Metals (mg/L)													
Arsenic		0.19		0.15	0.00014	0.01	22	95%	0.00071	Location 25	0.00049	Gamma	0.00052
Chromium		0.21		0.074		0.1	22	64%	0.00234	Location 3	0.00027	NP	0.00071
Copper		0.012		0.009			22	100%	0.00344	Location 3	0.00114	NP	0.00138
Zinc		0.11		0.12	26		22	27%	0.00482	Location 7	0.00155	NP	0.00276
Total Dissolved Metals (mg/L)													
Arsenic							22	91%	0.00061	Location 18	0.00040	NP	0.00052
Chromium							22	50%	0.00013	Location 11	0.00008	NP	0.00009
Copper							22	100%	0.00132	Location 25	0.00073	NP	0.00080
Zinc							22	68%	0.00487	Location 11	0.00281	NP	0.00675
Pentachlorophenol (µg/L)		13		11	3	1	22	0%	ND	NA	0.12391	Normal	0.124905
Polyaromatic Hydrocarbons (ug/L)													
Acenaphthene	L	520		990			22	18%	0.16600	Location 25	0.01900	NP	0.053399
Acenaphthylene	L						22	0%	ND	NA	0.00648	NP	0.007031
Anthracene	L			40,000			22	0%	ND	NA	0.00648	NP	0.007031
Benzo (a) anthracene	H, C			0.018			22	0%	ND	NA	0.00648	NP	0.007031
Benzo (a) pyrene	H, C			0.018		0.2	22	0%	ND	NA	0.00648	NP	0.007031
Benzo (b) fluoranthene	H, C			0.018			22	0%	ND	NA	0.00619	Normal	0.006239
Benzo (ghi) perylene	H, C						22	0%	ND	NA	0.00619	Normal	0.006239
Benzo (k) fluoranthene	H, C			0.018			22	0%	ND	NA	0.00619	Normal	0.006239
Chrysene	H, C			0.018			22	0%	ND	NA	0.00648	NP	0.007031
Dibenzo (a,h) anthracene	H, C			0.018			22	0%	ND	NA	0.01239	Normal	0.012492
Fluoranthene	H		54	140			22	0%	ND	NA	0.00655	NP	0.007252
Fluorene	L			5300			22	9%	0.06200	Location 25	0.00976	NP	0.021476
Indeno (1,2,3-cd) pyrene	H, C			0.018			22	0%	ND	NA	0.00619	Normal	0.006235
Naphthalene	L	620					22	14%	0.93000	Location 25	0.08732	NP	0.617948
Phenanthrene	L						22	5%	0.02950	Location 25	0.00755	NP	0.009581
Pyrene	H			4,000			22	0%	ND	NA	0.00677	NP	0.007524
Total LPAHs							22	18%	1.18750	Location 25	0.11603	NP	0.760173
Total HPAHs							22	0%	ND	NA	0.03405	Normal	0.034329
Total CPAHs			0.031				22	0%	ND	NA	0.02786	Normal	0.028088
Total PAHs							22	18%	1.18750	Location 25	0.12242	NP	0.762092

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION															
SAMPLE TYPE															
Sample ID Sample Date Sample Time		Inter-Armoring Water Statistics							Sub-Armoring Water Statistics						
CONTAMINANT OF INTEREST		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids		22	95%	54	Location 25	15.735909	Gamma	22.65654	22	64%	91	Location 9	21.796364	NP	80.31291
Total Metals (mg/L)				0											
Arsenic		22	100%	0.00206	Location 21	0.00068	NP	0.00084	22	95%	0.03860	Location 18	0.00890	Gamma	0.01420
Chromium		22	64%	0.00216	Location 3	0.00038	NP	0.00146	22	23%	0.00106	Location 25	0.00017	NP	0.00039
Copper		22	100%	0.00435	Location 20	0.00172	Lognormal	0.00215	22	82%	0.00281	Location 15	0.00081	Gamma	0.00124
Zinc		22	45%	0.01470	Location 17	0.00317	NP	0.01130	22	50%	0.02630	Location 14	0.00592	NP	0.02071
Total Dissolved Metals (mg/L)															
Arsenic		22	95%	0.00195	Location 21	0.00053	NP	0.00091	22	95%	0.03880	Location 18	0.00877	Gamma	0.01468
Chromium		22	45%	0.00018	Location 19	0.00008	NP	0.00013	22	73%	0.00107	Location 2	0.00027	Lognormal	0.00056
Copper		22	100%	0.00154	Location 17	0.00075	Gamma	0.00082	22	91%	0.00128	Location 25	0.00045	Gamma	0.00057
Zinc		22	64%	0.00724	Location 5	0.00251	NP	0.00722	22	82%	0.01920	Location 5	0.00579	NP	0.01631
Pentachlorophenol (µg/L)		22	14%	0.25	Location 6	0.1350909	NP	0.149546	22	14%	0.25	Location 6	0.1408864	NP	0.157789
Polyaromatic Hydrocarbons (ug/L)															
Acenaphthene	L	22	23%	1.81	Location 20	0.0960659	NP	0.910455	22	73%	19	Location 20	3.4012659	Gamma	8.510198
Acenaphthylene	L	22	18%	0.0506	Location 20	0.0087568	NP	0.012571	22	14%	3.27	Location 17	0.3053045	NP	2.292088
Anthracene	L	22	14%	0.0161	Location 20	0.006975	NP	0.008004	22	50%	0.458	Location 9	0.0616364	NP	0.299227
Benzo (a) anthracene	H, C	22	14%	0.0187	Location 5	0.0070295	NP	0.008187	22	18%	0.055	Location 7	0.0110068	NP	0.022519
Benzo (a) pyrene	H, C	22	14%	0.0125	Location 6	0.0067432	NP	0.007464	22	9%	0.0125	Location 4	0.0067591	NP	0.007478
Benzo (b) fluoranthene	H, C	22	14%	0.0136	Location 5	0.0067909	NP	0.007579	22	9%	0.0125	Location 6	0.0067568	NP	0.007476
Benzo (ghi) perylene	H, C	22	14%	0.0125	Location 6	0.0067432	NP	0.007464	22	9%	0.0187	Location 17	0.0070432	NP	0.008199
Benzo (k) fluoranthene	H, C	22	9%	0.0125	Location 6	0.0064636	NP	0.007007	22	14%	0.0125	Location 4	0.0070432	NP	0.007891
Chrysene	H, C	22	14%	0.0236	Location 5	0.0072523	NP	0.008798	22	27%	0.0503	Location 7	0.0121205	NP	0.024169
Dibenzo (a,h) anthracene	H, C	22	9%	0.025	Location 6	0.0129455	NP	0.01403	22	14%	0.025	Location 6	0.0140886	NP	0.015779
Fluoranthene	H	22	18%	0.111	Location 5	0.0122659	NP	0.033285	22	59%	10.4	Location 7	0.6262523	NP	5.31164
Fluorene	L	22	18%	0.398	Location 20	0.028225	NP	0.207785	22	59%	10.3	Location 17	1.13365	NP	6.445857
Indeno (1,2,3-cd) pyrene	H, C	22	9%	0.0125	Location 6	0.0064636	NP	0.007007	22	5%	0.0144	Location 17	0.0065636	NP	0.007269
Naphthalene	L	22	36%	2.08	Location 20	0.1364273	NP	1.094928	22	73%	229	Location 5	13.322793	NP	118.1517
Phenanthrene	L	22	14%	0.147	Location 20	0.0185159	NP	0.055687	22	59%	6.4	Location 17	0.5387523	NP	3.734635
Pyrene	H	22	23%	0.0601	Location 5	0.009875	NP	0.020751	22	68%	3.14	Location 7	0.2308591	NP	1.66278
Total LPAHs		22	36%	4.5017	Location 20	0.270425	NP	2.312993	22	91%	232.325	Location 5	18.449943	Gamma	50.96557
Total HPAHs		22	18%	0.227	Location 5	0.0424795	NP	0.059128	22	64%	13.6453	Location 7	0.8769455	NP	7.032138
Total CPAHs		22	9%	0.0559	Location 5	0.029075	NP	0.031489	22	23%	0.1053	Location 7	0.034867	NP	0.04283
Total PAHs		22	41%	4.5469	Location 20	0.2869381	NP	2.362321	22	91%	232.3679	Location 5	19.315129	Gamma	51.64995

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
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SAMPLE LOCATION		Location 1		Location 2						Location 3							
SAMPLE TYPE		Surface Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW1006-1		MBSW1006-2		MBFC1006-2		MBPW1006-2		MBSW1006-3		MBSW1006-24 Duplicate of MBSW1006-3		MBFC1006-3		MBPW1006-3	
Sample Date		10/23/2006		10/23/2006		10/23/2006		10/23/2006		10/23/2006		10/23/2006		10/23/2006		10/23/2006	
Sample Time		14:30		14:50		13:45		13:20		12:00		14:30		12:35		11:45	
CONTAMINANT OF INTEREST																	
Total Suspended Solids		3	J	9	J	6	J	2.38	U	6	J	3	J	33		2.38	U
Total Metals (mg/L)																	
Arsenic		**0.00034**	**J**	**0.0004**	**J**	**0.00039**	**J**	**0.00598**		**0.00065**	**J**	**0.00049**	**J**	**0.0007**	**J**	**0.0154**	
Chromium		0.00015	U	0.00015	U	0.00015	U	0.00015	U	**0.00234**		0.00015	U	**0.00216**		0.00015	U
Copper		**0.00095**	**J**	**0.00096**	**J**	**0.00103**		0.00008	U	**0.00344**		**0.0021**		**0.00321**		0.00008	U
Zinc		0.0017	U	0.0017	U	0.0017	U	**0.0141**		0.0017	U	0.0017	U	0.0017	U	0.0017	U
Total Dissolved Metals (mg/L)																	
Arsenic		0.00008	U	0.00008	U	0.00008	U	**0.00589**		**0.00019**	**J**	0.00008	U	**0.00012**	**J**	0.0144	
Chromium		**0.00012**	**J**	**0.00012**	**J**	**0.00013**	**J**	**0.00107**		**0.0001**	**J**	**0.00009**	**J**	**0.00015**	**J**	0.00016	J
Copper		**0.00064**	**J**	**0.00076**	**J**	**0.00064**	**J**	**0.00026**	**J**	**0.00065**	**J**	**0.0008**	**J**	**0.00093**	**J**	0.00013	J
Zinc		**0.00326**	**J**	**0.00376**	**J**	0.00005	U	**0.0149**		**0.00351**	**J**	**0.00374**	**J**	**0.00376**	**J**	0.00005	U
Pentachlorophenol (µg/L)		0.255	U	0.253	U	0.249	U	0.253	U	0.24	U	0.244	U	0.25	U	0.25	U
Polyaromatic Hydrocarbons (ug/L)																	
Acenaphthene	L	0.0128	U	0.0126	U	0.0124	U	**0.543**		**0.0246**		**0.0239**	**J**	**0.0184**	**J**	**0.157**	
Acenaphthylene	L	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Anthracene	L	0.0128	U	0.0126	U	0.0124	U	**0.0234**	**J**	0.012	U	0.0122	U	0.0125	U	0.0125	U
Benzo (a) anthracene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Benzo (a) pyrene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Benzo (b) fluoranthene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Benzo (ghi) perylene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Benzo (k) fluoranthene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Chrysene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Dibenzo (a,h) anthracene	H, C	0.0255	U	0.0253	U	0.0249	U	0.0253	U	0.024	U	0.0244	U	0.025	U	0.025	U
Fluoranthene	H	0.0128	U	0.0126	U	0.0124	U	**0.0788**		0.012	U	0.0122	U	0.0125	U	**0.0337**	
Fluorene	L	0.0128	U	0.0126	U	0.0124	U	**0.0789**		0.012	U	0.0122	U	0.0125	U	**0.103**	
Indeno (1,2,3-cd) pyrene	H, C	0.0128	U	0.0126	U	0.0124	U	0.0126	U	0.012	U	0.0122	U	0.0125	U	0.0125	U
Naphthalene	L	0.0128	U	0.0126	U	0.0124	U	**0.146**		**0.0836**		**0.0797**		**0.0629**		**0.0164**	**J**
Phenanthrene	L	0.0128	U	0.0126	U	0.0124	U	**0.0183**	**J**	0.012	U	0.0122	U	0.0125	U	0.0125	U
Pyrene	H	0.0128	U	0.0126	U	0.0124	U	**0.032**		0.012	U	0.0122	U	0.0125	U	**0.024**	**J**
Total LPAHs		0.03840	U	0.03780	U	0.03720	U	**0.80960**		**0.10820**		**0.10360**		**0.08130**		**0.27640**	
Total HPAHs		0.07035	U	0.06935	U	0.06825	U	**0.11080**		0.06600	U	0.06710	U	0.06875	U	**0.05770**	
Total CPAHs		0.05755	U	0.05675	U	0.05585	U	0.05675	U	0.05400	U	0.05490	U	0.05625	U	0.05625	U
Total PAHs		0.05438	U	0.05358	U	0.05273	U	**0.92040**		**0.10820**		**0.10360**		**0.08130**		**0.33410**	

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Location 4						Location 5								Location 6					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW1006-4		MBFC1006-4		MBPW1006-4		MBSW1006-5		MBFC1006-5		MBFC1006-23 Duplicate of MBFC1006-5		MBPW1006-5		MBSW1006-6		MBFC1006-6		MBPW1006-6	
Sample Date		10/19/2006		10/19/2006		10/19/2006		10/19/2006		10/19/2006		10/19/2006		10/19/2006		10/20/2006		10/20/2006		10/20/2006	
Sample Time		16:38		17:20		17:00		15:00		15:45		14:20		15:20		14:35		15:45		15:10	
CONTAMINANT OF INTEREST																					
Total Suspended Solids		4	J	19		69		3	J	15		17		42		4	J	2.38	U	10	
Total Metals (mg/L)																					
Arsenic		0.00049	J	0.00056	J	0.0163		0.00043	J	0.00055	J	0.00053	J	0.01		0.00049	J	0.00047	J	0.00751	
Chromium		0.00023	J	0.00085	J	0.00015	J	0.00015	U	0.00015	U	0.00015	U	0.00015	U	0.00022	J	0.00015	U	0.00015	U
Copper		0.00082	J	0.00171		0.00051	J	0.00108		0.00182		0.00137		0.00008	U	0.00084	J	0.00077	J	0.0003	J
Zinc		0.00403	J	0.00587	J	0.0079	J	0.0017	U	0.0017	U	0.0017	U	0.0158		0.00292	J	0.00305	J	0.00502	J
Total Dissolved Metals (mg/L)																					
Arsenic		0.00048	J	0.00042	J	0.0162		0.00042	J	0.00047	J	0.00047	J	0.0102		0.00048	J	0.00038	J	0.00739	
Chromium		0.00009	U	0.00009	U	0.00012	J	0.00009	U	0.00009	U	0.00009	U	0.00039	J	0.00009	U	0.00009	U	0.00009	U
Copper		0.00082	J	0.00062	J	0.00053	J	0.00072	J	0.00064	J	0.00072	J	0.00069	J	0.00066	J	0.00059	J	0.00032	J
Zinc		0.00414	J	0.00414	J	0.00886	J	0.00448	J	0.006	J	0.00724	J	0.0192		0.00005	U	0.00005	U	0.00563	J
Pentachlorophenol (µg/L)		0.25	U	0.249	J	0.249	U	0.244	U	0.249	U	0.25	U	0.249	U	0.242	U	0.25	J	0.25	J
Polyaromatic Hydrocarbons (ug/L)																					
Acenaphthene	L	0.0126	UJ	0.0125	U	0.03	J	0.0885		0.135		0.141		3.18		0.0121	U	0.0124	U	3.52	
Acenaphthylene	L	0.0126	UJ	0.0124	UJ	0.0125	UJ	0.0122	U	0.0124	U	0.0125	U	0.0124	U	0.0121	U	0.0125	UJ	0.025	U
Anthracene	L	0.0126	UJ	0.0125	U	0.0125	UJ	0.0122	U	0.0124	U	0.014	J	0.0137	J	0.0121	U	0.0124	U	0.0125	U
Benzo (a) anthracene	H, C	0.0126	UJ	0.0125	U	0.0124	U	0.0122	U	0.0124	U	0.0187	J	0.0124	U	0.0121	U	0.0125	UJ	0.0125	U
Benzo (a) pyrene	H, C	0.0126	UJ	0.0124	UJ	0.0125	UJ	0.0122	U	0.0124	U	0.0125	U	0.0124	U	0.0121	U	0.0125	UJ	0.0125	U
Benzo (b) fluoranthene	H, C	0.0125	U	0.0124	UJ	0.0124	U	0.0122	U	0.0124	U	0.0136	J	0.0124	U	0.0121	U	0.0124	U	0.0125	UJ
Benzo (ghi) perylene	H, C	0.0125	U	0.0124	UJ	0.0124	U	0.0122	U	0.0124	U	0.0125	U	0.0124	U	0.0121	U	0.0125	UJ	0.0125	UJ
Benzo (k) fluoranthene	H, C	0.0125	U	0.0125	U	0.0125	UJ	0.0122	U	0.0124	U	0.0125	U	0.0124	U	0.0121	U	0.0125	UJ	0.0125	UJ
Chrysene	H, C	0.0126	UJ	0.0125	U	0.0124	U	0.0122	U	0.0153	J	0.0236	J	0.0124	U	0.0121	U	0.0125	UJ	0.0125	UJ
Dibenzo (a,h) anthracene	H, C	0.025	U	0.025	U	0.0249	U	0.0244	U	0.0249	U	0.025	U	0.0249	U	0.0242	U	0.025	UJ	0.025	UJ
Fluoranthene	H	0.0125	U	0.0125	U	0.0493	J	0.0122	U	0.0673		0.111		0.0263		0.0121	U	0.0125	UJ	0.0125	U
Fluorene	L	0.0125	U	0.0125	U	0.0485	J	0.0286		0.0733		0.0933		0.118		0.0121	U	0.0125	UJ	0.119	
Indeno (1,2,3-cd) pyrene	H, C	0.0125	U	0.0125	U	0.0124	U	0.0122	U	0.0124	U	0.0125	U	0.0124	U	0.0121	U	0.0125	UJ	0.0125	U
Naphthalene	L	0.0126	UJ	0.0229		0.0124	U	0.783		0.597		0.486		229		0.0121	U	0.0124	U	0.778	
Phenanthrene	L	0.0126	UJ	0.0125	U	0.0201	J	0.0122	U	0.0818		0.137		0.0133	J	0.0121	U	0.0124	U	0.0125	UJ
Pyrene	H	0.0126	UJ	0.0125	U	0.0227		0.0122	U	0.0412		0.0601		0.0166	J	0.0121	U	0.0125	UJ	0.0125	UJ
Total LPAHs		0.03775	U	0.0229		0.0986		0.90010		0.88710		0.87130		232.32500		0.03630	U	0.03730	U	4.41700	
Total HPAHs		0.06895	U	0.06860	U	0.07200		0.06710	U	0.12380		0.22700		0.04290		0.06655	U	0.06870	U	0.06875	U
Total CPAHs		0.05640	U	0.05610	U	0.05595	U	0.05490	U	0.01530		0.05590		0.05585	U	0.05445	U	0.05620	U	0.05625	U
Total PAHs		0.05335	U	0.0229		0.17060		0.90010		1.01090		1.09830		232.36790		0.05143	U	0.05300	U	4.41700	

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
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SAMPLE LOCATION		Location 7								Location 8								Location 9							
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water				Surface Water		Inter-Armoring Water		Sub-Armoring Water			
Sample ID		MBSW1006-7		MBFC1006-7		MBPW1006-7		MBPW1006-24 Duplicate of MBPW1006-7		MBSW1006-8		MBFC1006-8		MBPW1006-8				MBSW1006-9		MBFC1006-9		MBPW1006-9			
Sample Date		10/20/2006		10/20/2006		10/20/2006		10/20/2006		10/20/2006		10/20/2006		10/20/2006				10/20/2006		10/20/2006		10/20/2006			
Sample Time		11:15		12:30		11:45		16:05		9:20		10:15		9:45				7:50		8:55		8:25			
CONTAMINANT OF INTEREST																									
Total Suspended Solids		4	J	16		2.38	U	2.38	U	5	J	4	J	2.38	U			4	J	11		91			
Total Metals (mg/L)																									
Arsenic		0.00049	J	0.00045	J	0.00186		0.00175		0.00044	J	0.00042	J	0.00102				0.00053	J	0.00053	J	0.0193			
Chromium		0.00023	J	0.00037	J	0.00015	U	0.00015	U	0.00024	J	0.00021	J	0.00015	U			0.00024	J	0.00041	J	0.00015	U		
Copper		0.00094	J	0.0012		0.00029	J	0.00041	J	0.0008	J	0.00111		0.00019	J			0.00086	J	0.00115		0.00043	J		
Zinc		0.00482	J	0.00389	J	0.00922	J	0.0102		0.00289	J	0.00374	J	0.00305	J			0.00293	J	0.00471	J	0.00887	J		
Total Dissolved Metals (mg/L)																									
Arsenic		0.00036	J	0.00038	J	0.0017		0.00171		0.00042	J	0.00046	J	0.00088	J			0.00057	J	0.00045	J	0.0194			
Chromium		0.00009	U	0.00009	U	0.00016	J	0.00009	U	0.00009	U	0.00009	U	0.00009	U			0.00009	U	0.00009	U	0.0003	J		
Copper		0.00058	J	0.00075	J	0.00028	J	0.00026	J	0.00071	J	0.00073	J	0.00019	J			0.00078	J	0.00064	J	0.00046	J		
Zinc		0.00466	J	0.00005	U	0.0101		0.0108		0.00005	U	0.00005	U	0.00414	J			0.00005	U	0.00005	U	0.00937	J		
Pentachlorophenol (µg/L)		0.25	U	0.249	U	0.248	J	0.248	U	0.25	U	0.244	U	0.25	U			0.249	U	0.25	U	0.251	U		
Polyaromatic Hydrocarbons (ug/L)																									
Acenaphthene	L	0.0125	U	0.0124	U	4.01	J	1.81		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	18			
Acenaphthylene	L	0.0125	U	0.0124	U	0.0538		0.0468		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.101	U		
Anthracene	L	0.0125	U	0.0124	U	0.128		0.112		0.0125	U	0.0122	U	0.0565				0.0124	U	0.0125	U	0.458			
Benzo (a) anthracene	H, C	0.0125	U	0.0124	U	0.055		0.0454		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0317			
Benzo (a) pyrene	H, C	0.0125	U	0.0124	U	0.0125	U	0.0124	U	0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0126	U		
Benzo (b) fluoranthene	H, C	0.0125	U	0.0124	U	0.0125	U	0.0124	U	0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0126	U		
Benzo (ghi) perylene	H, C	0.0125	U	0.0124	U	0.0125	U	0.0124	U	0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0126	U		
Benzo (k) fluoranthene	H, C	0.0125	U	0.0124	U	0.0125	U	0.0124	U	0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0126	U		
Chrysene	H, C	0.0125	U	0.0124	U	0.0503		0.0436		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0375			
Dibenzo (a,h) anthracene	H, C	0.025	U	0.0249	U	0.0248	UJ	0.0248	U	0.025	U	0.0244	U	0.025	U			0.0249	U	0.025	U	0.0251	U		
Fluoranthene	H	0.0125	U	0.0124	U	10.4	J	6.52		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	1.37			
Fluorene	L	0.0125	U	0.0124	U	0.05	U	0.0248	U	0.0125	U	0.0122	U	0.075	U			0.0124	U	0.0125	U	4.99			
Indeno (1,2,3-cd) pyrene	H, C	0.0125	U	0.0124	U	0.0125	U	0.0124	U	0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.0126	U		
Naphthalene	L	0.0125	U	0.0124	U	2.68	J	0.257		0.0125	U	0.0122	U	0.075	U			0.0124	U	0.0125	U	1.3			
Phenanthrene	L	0.0125	U	0.0124	U	0.0509	J	0.0255		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	2.66			
Pyrene	H	0.0125	U	0.0124	U	3.14		2.78		0.0125	U	0.0122	U	0.0125	U			0.0124	U	0.0125	U	0.734			
Total LPAHs		0.03750	U	0.03720	U	6.92270		2.25130		0.03750	U	0.03660	U	0.05650				0.03720	U	0.03750	U	27.40800			
Total HPAHs		0.06875	U	0.06825	U	13.64530		9.38900		0.06875	U	0.06710	U	0.06875	U			0.06825	U	0.06875	U	2.17320			
Total CPAHs		0.05625	U	0.05585	U	0.10530		0.08900		0.05625	U	0.05490	U	0.05625	U			0.05585	U	0.05625	U	0.06920			
Total PAHs		0.05313	U	0.05273	U	20.56800		11.64030		0.05313	U	0.05185	U	0.05650				0.05273	U	0.05313	U	29.58120			

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Location 10						Location 11						Location 12					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW1006-10		MBFC1006-10		MBPW1006-10		MBSW1006-11		MBFC1006-11		MBPW1006-11		MBSW1006-12		MBFC1006-12		MBPW1006-12	
Sample Date		10/19/2006		10/19/2006		10/19/2006		10/18/2006		10/18/2006		10/18/2006		10/17/2006		10/17/2006		10/17/2006	
Sample Time		8:50		9:55		9:35		13:45		14:45		14:20		15:10		14:45		14:50	
CONTAMINANT OF INTEREST																			
Total Suspended Solids		4	J	13		2.38	U	4	J	6	J	5	J	2.38	U	4	J	16	
Total Metals (mg/L)																			
Arsenic		**0.0006**	J	**0.00054**	J	**0.00247**		**0.00043**	J	**0.00048**	J	**0.00104**		**0.00047**	J	**0.00047**	J	**0.00318**	
Chromium		0.00015	U	0.00015	U	0.00015	U	**0.00016**	J	**0.00031**	J	0.00015	U	**0.00018**	J	**0.00018**	J	0.00015	U
Copper		**0.001**		**0.00143**		0.00008	U	**0.00088**	J	**0.0012**		**0.00068**	J	**0.00232**		**0.00093**	J	**0.00102**	
Zinc		0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U
Total Dissolved Metals (mg/L)																			
Arsenic		**0.00042**	J	**0.00044**	J	**0.00247**		**0.00039**	J	**0.00043**	J	**0.00096**	J	**0.00041**	J	**0.00044**	J	**0.00291**	
Chromium		**0.00012**	J	0.00009	U	**0.00009**	J	**0.00013**	J	**0.0001**	J	0.00009	U	**0.00013**	J	**0.00009**	J	**0.00013**	J
Copper		**0.00082**	J	**0.00083**	J	**0.00029**	J	**0.00076**	J	**0.00066**	J	**0.00018**	J	**0.00071**	J	**0.00059**	J	**0.00066**	J
Zinc		**0.00481**	J	0.00005	U	**0.00641**	J	**0.00487**	J	**0.00324**	J	**0.00494**	J	**0.004**	J	**0.00303**	J	**0.00318**	J
Pentachlorophenol (µg/L)		0.25	U	0.249	U	0.251	U	0.253	U	0.242	U	0.24	U	0.243	U	0.24	U	0.249	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.0125	U	0.0124	U	**0.465**		0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	3.46	
Acenaphthylene	L	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0622	U
Anthracene	L	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	**0.0901**	
Benzo (a) anthracene	H, C	0.0125	U	0.0124	U	**0.0319**		0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Benzo (a) pyrene	H, C	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Benzo (b) fluoranthene	H, C	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Benzo (ghi) perylene	H, C	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Benzo (k) fluoranthene	H, C	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Chrysene	H, C	0.0125	U	0.0124	U	**0.0414**		0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Dibenzo (a,h) anthracene	H, C	0.025	U	0.0249	U	0.0251	U	0.0253	U	0.0242	U	0.024	U	0.0243	U	0.024	U	0.0249	U
Fluoranthene	H	0.0125	U	0.0124	U	**0.876**		0.0126	U	0.0121	U	0.024	U	0.0121	U	0.012	U	**0.0592**	
Fluorene	L	0.0125	U	0.0124	U	**0.0387**		0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	**1.49**	
Indeno (1,2,3-cd) pyrene	H, C	0.0125	U	0.0124	U	0.0126	U	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Naphthalene	L	0.0125	U	0.0124	U	**0.0252**		0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	0.0124	U
Phenanthrene	L	0.0125	U	0.0124	U	**0.0228**	J	0.0126	U	0.0121	U	0.012	U	0.0121	U	0.012	U	**0.0619**	
Pyrene	H	0.0125	U	**0.0177**	J	**0.494**		0.0126	U	0.0121	U	0.024	U	0.0121	U	0.012	U	**0.0622**	
Total LPAHs		0.03750	U	0.03720	U	**0.55170**		0.03780	U	0.03630	U	0.03600	U	0.03630	U	0.03600	U	**5.10200**	
Total HPAHs		0.06875	U	**0.01770**		**1.44330**		0.06935	U	0.06655	U	0.07800	U	0.06660	U	0.06600	U	**0.12140**	
Total CPAHs		0.05625	U	0.05585	U	**0.07330**		0.05675	U	0.05445	U	0.05400	U	0.05450	U	0.05400	U	0.05585	U
Total PAHs		0.05313	U	**0.01770**		**1.99500**		0.05358	U	0.05143	U	0.05700	U	0.05145	U	0.05100	U	**5.22340**	

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Location 13			Location 14				Location 15		
SAMPLE TYPE		Surface Water	Inter-Armoring Water	Sub-Armoring Water	Surface Water	Surface Water	Inter-Armoring Water	Sub-Armoring Water	Surface Water	Inter-Armoring Water	Sub-Armoring Water
Sample ID		MBSW1006-13	MBFC1006-13	MBPW1006-13	MBSW1006-14	MBSW1006-22 Duplicate of MBSW1006-14	MBFC1006-14	MBPW1006-14	MBSW1006-15	MBFC1006-15	MBPW1006-15
Sample Date		10/17/2006	10/17/2006	10/17/2006	10/18/2006	10/18/2006	10/18/2006	10/18/2006	10/19/2006	10/19/2006	10/19/2006
Sample Time		13:47	11:45	10:45	11:10	8:45	12:50	12:15	12:25	13:30	13:00
CONTAMINANT OF INTEREST											
Total Suspended Solids		4 J	6 J	68	5 J	6 J	46	45	6 J	25	11
Total Metals (mg/L)											
Arsenic		0.00045 J	0.00073 J	0.00691	0.00044 J	0.00048 J	0.00074 J	0.0124	0.00045 J	0.00046 J	0.0011
Chromium		0.00015 U	0.00026 J	0.00015 U	0.00022 J	0.00022 J	0.00122	0.00059 J	0.00015 U	0.00015 U	0.00015 U
Copper		0.00117	0.0019	0.00053 J	0.00088 J	0.00101	0.00294	0.00113	0.00089 J	0.00214	0.00281
Zinc		0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0103	0.0263	0.0017 U	0.0017 U	0.0017 U
Total Dissolved Metals (mg/L)											
Arsenic		0.00039 J	0.00057 J	0.00717	0.00042 J	0.00037 J	0.0004 J	0.0123	0.00038 J	0.00041 J	0.00093 J
Chromium		0.00011 J	0.00014 J	0.00097 J	0.00011 J	0.00011 J	0.0001 J	0.00092 J	0.00009 U	0.00009 U	0.00009 U
Copper		0.00076 J	0.00076 J	0.00035 J	0.00064 J	0.00055 J	0.00068 J	0.00038 J	0.00066 J	0.00076 J	0.00061 J
Zinc		0.00387 J	0.00593 J	0.00218 J	0.00323 J	0.00308 J	0.00332 J	0.0109	0.00005 U	0.00435 J	0.00005 U
Pentachlorophenol (µg/L)		0.253 U	0.246 U	0.25 U	0.251 U	0.251 U	0.246 U	0.243 U	0.248 U	0.246 U	0.246 U
Polyaromatic Hydrocarbons (ug/L)											
Acenaphthene	L	0.0126 U	0.0331	0.788	0.0126 U	0.0126 U	0.0123 U	0.375	0.0124 U	0.0123 U	0.0123 U
Acenaphthylene	L	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Anthracene	L	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Benzo (a) anthracene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Benzo (a) pyrene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Benzo (b) fluoranthene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Benzo (ghi) perylene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Benzo (k) fluoranthene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Chrysene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Dibenzo (a,h) anthracene	H, C	0.0253 U	0.0246 U	0.025 U	0.0251 U	0.0251 U	0.0246 U	0.0243 U	0.0248 U	0.0246 U	0.0246 U
Fluoranthene	H	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0143 J	0.0123 U	0.0286	0.0124 U	0.0123 U	0.0123 U
Fluorene	L	0.0126 U	0.0123 U	0.193	0.0126 U	0.0126 U	0.0123 U	0.0792	0.0124 U	0.0123 U	0.0123 U
Indeno (1,2,3-cd) pyrene	H, C	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.0121 U	0.0124 U	0.0123 U	0.0123 U
Naphthalene	L	0.0126 U	0.0604	0.387	0.0126 U	0.0126 U	0.0123 U	0.0599	0.0124 U	0.0123 U	0.0123 U
Phenanthrene	L	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0126 U	0.0123 U	0.017 J	0.0124 U	0.0123 U	0.0123 U
Pyrene	H	0.0126 U	0.0123 U	0.0125 U	0.0126 U	0.0128 J	0.0123 U	0.0204 J	0.0124 U	0.0123 U	0.0123 U
Total LPAHs		0.03780 U	0.09350	1.36800	0.03780 U	0.03780 U	0.03690 U	0.53110	0.03720 U	0.03690 U	0.03690 U
Total HPAHs		0.06935 U	0.06765 U	0.06875 U	0.06925 U	0.02710	0.06765 U	0.04900	0.06820 U	0.06765 U	0.06765 U
Total CPAHs		0.05675 U	0.05535 U	0.05625 U	0.05665 U	0.05665 U	0.05535 U	0.05450 U	0.05580 U	0.05535 U	0.05535 U
Total PAHs		0.05358 U	0.09350	1.36800	0.05353 U	0.02710	0.05228 U	0.58010	0.05270 U	0.05228 U	0.05228 U

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
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SAMPLE LOCATION		Location 16						Location 17						Location 18					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW1006-16		MBFC1006-16		MBPW1006-16		MBSW1006-17		MBFC1006-17		MBPW1006-17		MBSW1006-18		MBFC1006-18		MBPW1006-18	
Sample Date		10/20/2006		10/20/2006		10/20/2006		10/24/2006		10/24/2006		10/24/2006		10/16/2006		10/16/2006		10/16/2006	
Sample Time		13:00		14:10		13:50		11:20		10:18		10:58		13:25		14:10		12:55	
CONTAMINANT OF INTEREST																			
Total Suspended Solids		10		4	J	33		9	J	6	J	3	J	6	J	6	J	2.38	U
Total Metals (mg/L)																			
Arsenic		0.00039	J	0.00055	J	0.0306		0.00036	J	0.00035	J	0.00261		0.00068	J	0.00058	J	0.0386	
Chromium		0.00035	J	0.00021	J	0.00015	U	0.00015	U	0.00015	U	0.00015	U	0.00033	J	0.00025	J	0.00022	J
Copper		0.0009	J	0.00092	J	0.00059	J	0.0011		0.00309		0.00115		0.00085	J	0.00104		0.00047	J
Zinc		0.00356	J	0.00349	J	0.00394	J	0.0017	U	0.0147		0.0017	U	0.0017	U	0.0017	U	0.0017	U
Total Dissolved Metals (mg/L)																			
Arsenic		0.00036	J	0.00054	J	0.0297		0.00021	J	0.00008	U	0.00226		0.00061	J	0.00048	J	0.0388	
Chromium		0.00009	U	0.00009	U	0.00024	J	0.00009	J	0.00011	J	0.00042	J	0.00009	U	0.00009	U	0.00015	J
Copper		0.00058	J	0.00062	J	0.00031	J	0.00058	J	0.00154		0.00022	J	0.0006	J	0.00063	J	0.00007	U
Zinc		0.00005	U	0.00005	U	0.00005	U	0.00366	J	0.00403	J	0.00603	J	0.00307	J	0.00334	J	0.00071	J
Pentachlorophenol (µg/L)		0.25	U	0.249	U	0.249	U	0.246	U	0.245	U	0.249	J	0.236	U	0.253	U	0.25	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	4.2	J	0.0204	J	0.0126	U	17	
Acenaphthylene	L	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	3.27	J	0.0118	U	0.0126	U	0.15	U
Anthracene	L	0.0125	U	0.0124	U	0.0178	J	0.0123	U	0.0123	U	0.0384	J	0.0118	U	0.0126	U	0.174	
Benzo (a) anthracene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.0125	U
Benzo (a) pyrene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.0125	U
Benzo (b) fluoranthene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.0125	U
Benzo (ghi) perylene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0187	J	0.0118	U	0.0126	U	0.0125	U
Benzo (k) fluoranthene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.0125	U
Chrysene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.0139	J
Dibenzo (a,h) anthracene	H, C	0.025	U	0.0249	U	0.0249	U	0.0246	U	0.0245	U	0.0249	UJ	0.0236	U	0.0253	U	0.025	U
Fluoranthene	H	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0544	J	0.0118	U	0.0126	U	0.441	
Fluorene	L	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	10.3	J	0.0118	U	0.0126	U	4.11	
Indeno (1,2,3-cd) pyrene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0144	J	0.0118	U	0.0126	U	0.0125	U
Naphthalene	L	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	0.0622	UJ	0.0118	U	0.0142	J	6.57	
Phenanthrene	L	0.0125	U	0.0124	U	0.0124	U	0.0123	U	0.0123	U	6.4	J	0.0118	U	0.0126	U	0.0262	
Pyrene	H	0.0125	U	0.0124	U	0.0263		0.0123	U	0.0123	U	0.0124	UJ	0.0118	U	0.0126	U	0.276	
Total LPAHs		0.03750	U	0.03720	U	0.01780		0.03690	U	0.03690	U	24.20840		0.02040		0.01420		27.88020	
Total HPAHs		0.06875	U	0.06825	U	0.02630		0.06765	U	0.06760	U	0.08750		0.06490	U	0.06935	U	0.73090	
Total CPAHs		0.05625	U	0.05585	U	0.05585	U	0.05535	U	0.05530	U	0.03310		0.05310	U	0.05675	U	0.01390	
Total PAHs		0.05313	U	0.05273	U	0.04410		0.05228	U	0.05225	U	24.29590		0.02040		0.01420		28.61110	

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Location 19						Location 20						Location 21					
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring Water	
Sample ID		MBSW1006-19		MBFC1006-19		MBPW1006-19		MBSW1006-20		MBFC1006-20		MBPW1006-20		MBSW1006-21		MBFC1006-21		MBPW1006-21	
Sample Date		10/16/2006		10/16/2006		10/16/2006		10/19/2006		10/19/2006		10/19/2006		10/17/2006		10/17/2006		10/17/2006	
Sample Time		15:20		15:50		15:00		10:25		11:25		10:50		9:20		9:45		9:00	
CONTAMINANT OF INTEREST																			
Total Suspended Solids		20		9	J	2.38	U	4	J	45		55		6	J	12		2.38	U
Total Metals (mg/L)																			
Arsenic		0.00048	J	0.00049	J	0.00051	J	0.0005	J	0.0016		0.0129		0.00045	J	0.00206		0.00516	
Chromium		0.00025	J	0.00022	J	0.00046	J	0.00015	U	0.00015	U	0.00015	U	0.00022	J	0.00015	U	0.00015	U
Copper		0.00089	J	0.00127		0.00146		0.00104		0.00435		0.0018		0.0011		0.00087	J	0.00054	J
Zinc		0.0017	U	0.0017	U	0.012		0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U	0.0017	U
Total Dissolved Metals (mg/L)																			
Arsenic		0.00044	J	0.00046	J	0.00054	J	0.00042	J	0.00136		0.0126		0.00043	J	0.00195		0.00544	
Chromium		0.0001	J	0.00018	J	0.00017	J	0.00009	J	0.00009	U	0.00018	J	0.00012	J	0.00014	J	0.00011	J
Copper		0.00068	J	0.00081	J	0.00108		0.0007	J	0.0008	J	0.00035	J	0.00081	J	0.00054	J	0.00007	U
Zinc		0.00311	J	0.00334	J	0.00524	J	0.00005	U	0.00005	U	0.00676	J	0.00476	J	0.0049	J	0.00258	J
Pentachlorophenol (µg/L)		0.25	U	0.249	U	0.249	U	0.249	U	0.253	U	0.25	U	0.243	U	0.244	U	0.24	U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	0.0125	U	0.0124	U	0.0124	U	0.0124	U	1.81		19		0.0121	U	0.0122	U	0.0413	
Acenaphthylene	L	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0506		6.25	U	0.0121	U	0.0122	U	0.012	U
Anthracene	L	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0161	J	0.276		0.0121	U	0.0122	U	0.012	U
Benzo (a) anthracene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Benzo (a) pyrene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Benzo (b) fluoranthene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Benzo (ghi) perylene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Benzo (k) fluoranthene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Chrysene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Dibenzo (a,h) anthracene	H, C	0.025	U	0.0249	U	0.0249	U	0.0249	U	0.0253	U	0.025	U	0.0243	U	0.0244	U	0.024	U
Fluoranthene	H	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0292		0.231		0.0121	U	0.0122	U	0.0678	
Fluorene	L	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.398		6.25	U	0.0121	U	0.0122	U	0.0478	
Indeno (1,2,3-cd) pyrene	H, C	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.0126	U	0.0125	U	0.0121	U	0.0122	U	0.012	U
Naphthalene	L	0.0125	U	0.0124	U	0.0425		0.0124	U	2.08		51.9		0.0121	U	0.0717		0.0177	J
Phenanthrene	L	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.147		2.45		0.0121	U	0.0122	U	0.0441	
Pyrene	H	0.0125	U	0.0124	U	0.0124	U	0.0124	U	0.016	J	0.111		0.0121	U	0.0122	U	0.0458	
Total LPAHs		0.03750	U	0.03720	U	0.04250		0.03720	U	4.50170		73.62600		0.03630	U	0.07170		0.15090	
Total HPAHs		0.06875	U	0.06825	U	0.06825	U	0.06825	U	0.04520		0.34200		0.06660	U	0.06710	U	0.11360	
Total CPAHs		0.05625	U	0.05585	U	0.05585	U	0.05585	U	0.05675	U	0.05625	U	0.05450	U	0.05490	U	0.05400	U
Total PAHs		0.05313	U	0.05273	U	0.04250		0.05273	U	4.54690		73.96800		0.05145	U	0.07170		0.26450	

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2006

SAMPLE LOCATION		Location 25						Location 26								Location 27	
SAMPLE TYPE		Surface Water		Inter-Armoring Water		Sub-Armoring Water		Surface Water		Inter-Armoring Water		Sub-Armoring		Sub-Armoring		Surface Water	
Sample ID		MBSW1006-25		MBFC1006-25		MBPW1006-25		MBSW1106-26		MBFC1106-26		MBPW1006-26		MBPW1106-26		MBSW1006-27	
Sample Date		10/17/2006		10/18/2006		10/17/2006		11/3/2006		11/3/2006		10/24/2006		11/3/2006		10/18/2006	
Sample Time		16:02		16:55		15:55		15:45		16:05		9:05		15:56		10:17	
CONTAMINANT OF INTEREST																	
Total Suspended Solids		3	J	54		4	J	3	J	3	J	22		18		4	J
Total Metals (mg/L)																	
Arsenic		**0.00071**	J	**0.00079**	J	**0.00066**	J	0.000664	U	**0.00115**		**0.00084**	J	0.000664	U	**0.00046**	J
Chromium		**0.00016**	J	**0.00098**	J	**0.00106**		0.000121	U	0.000121	U	0.00015	U	0.000121	U	**0.00026**	J
Copper		**0.00106**		**0.00299**		**0.00258**		**0.0012**	J	**0.00075**	J	0.00008	U	**0.00116**	J	**0.00091**	J
Zinc		0.0017	U	**0.00955**	J	**0.0143**		0.000469	U	0.000469	U	0.0017	U	0.000469	U	0.0017	U
Total Dissolved Metals (mg/L)																	
Arsenic		**0.00056**	J	**0.00048**	J	**0.00036**	J	0.000664	U	**0.000863**	J	**0.00059**	J	0.000664	U	**0.00047**	J
Chromium		0.00009	U	**0.0001**	J	0.00009	U	0.000121	U	0.000121	U	**0.00012**	J	0.000121	U	**0.00009**	J
Copper		**0.00132**		**0.00091**	J	**0.00128**		**0.000649**	J	**0.00075**	J	**0.00026**	J	**0.00116**	J	**0.00088**	J
Zinc		**0.00331**	J	**0.00298**	J	**0.00316**	J	0.0043	U	0.00273	U	**0.00389**	J	0.00465	U	**0.00428**	J
Pentachlorophenol (µg/L)		0.238	U	0.249	U	0.24	U	0.26	U	0.243	U	0.249	U	0.246	U	0.25	U
Polyaromatic Hydrocarbons (ug/L)																	
Acenaphthene	L	**0.166**		0.0124	U	**0.0216**	J	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Acenaphthylene	L	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Anthracene	L	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Benzo (a) anthracene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Benzo (a) pyrene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Benzo (b) fluoranthene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Benzo (ghi) perylene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Benzo (k) fluoranthene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Chrysene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Dibenzo (a,h) anthracene	H, C	0.0238	U	0.0249	U	0.024	U	0.026	U	0.0243	U	0.0249	U	0.0246	U	0.025	U
Fluoranthene	H	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Fluorene	L	**0.062**		0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Indeno (1,2,3-cd) pyrene	H, C	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Naphthalene	L	**0.93**		0.0124	U	**0.0302**		0.013	U	0.0121	U	0.0124	U	0.0181	J	0.0125	U
Phenanthrene	L	**0.0295**		0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Pyrene	H	0.0119	U	0.0124	U	0.012	U	0.013	U	0.0121	U	0.0124	U	0.0123	U	0.0125	U
Total LPAHs		**1.18750**		0.03720	U	**0.05180**		0.03900	U	0.03630	U	0.03720	U	**0.01810**		0.03750	U
Total HPAHs		0.06545	U	0.06825	U	0.06600	U	0.07150	U	0.06660	U	0.06825	U	0.06765	U	0.06875	U
Total CPAHs		0.05355	U	0.05585	U	0.05400	U	0.05850	U	0.05450	U	0.05585	U	0.05535	U	0.05625	U
Total PAHs		**1.18750**		0.05273	U	0.05180		0.05525	U	0.05145	U	0.05273	U	**0.01810**		0.05313	U

Table 3-1e
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Table Notes and Key
Spring 2006

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

KEY:
AWQC = Aquatic Water Quality Criteria (1996 version)
C = Carcinogenic PAH
Gamma = Gamma Distribution
H = High Molecular Weight PAH (HPAH)
HS = Henrey Sampler
J = Estimated Value
L = Low Molecular Weight PAH (LPAH)
MDL = Method Detection Limit.
mg/L = milligrams per liter
MRL = Method Reporting Limit.
N/A= Not Applicable
ND = Not Detected
NP = Nonparametric Distribution
U = Value Below MDL (value represents MDL)
ug/L = micrograms per liter

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION	Sediment Cap Performance Goals		Comparison Criteria									
Sample Type												
Sample ID												
Sample Date	McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Surface Water Statistics						
Sample Time												
CONTAMINANT OF INTEREST	Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids (mg/L)						23	100%	12	Location 6	7.26086957	Normal	8.4
Dissolved Metals (mg/L)												
Arsenic						23	83%	0.00004	Location 10	0.00004	NP	0.00026
Chromium (III)						23	100%	0.00039	Location 10	0.00039	Normal	0.00038
Copper						23	100%	0.00053	Location 10	0.00053	NP	0.00074
Zinc						23	83%	0.00158	Location 10	0.000336	NP	0.01200
Total Metals (mg/L)												
Arsenic	0.19		0.15	0.00014	0.01	23	100%	0.00041	Location 6	0.00027174	Normal	0.00029
Chromium (III)	0.21		0.074		0.1	23	52%	0.00165	Location 26	0.00042196	NP	0.00150
Copper	0.012		0.009			23	100%	0.00315	Location 19	0.00141391	NP	0.00157
Zinc	0.11		0.12	26		23	35%	0.0216	Location 20	0.00277957	NP	0.00685
Pentachlorophenol (ug/L)	13		11	3	1	23	0%	ND	N/A	0.12293478	NP	0.1233801
Polyaromatic Hydrocarbons (ug/L)												
Acenaphthene L	520			990		23	0%	ND	N/A	0.00613913	NP	0.0061619
Acenaphthylene L						23	0%	ND	N/A	0.00613913	NP	0.0061619
Anthracene L				40,000		23	0%	ND	N/A	0.00613913	NP	0.0061619
Benzo (a) anthracene H, C				0.018		23	0%	ND	N/A	0.00613913	NP	0.0061619
Benzo (a) pyrene H, C				0.018	0.2	23	0%	ND	N/A	0.00613913	NP	0.0061619
Benzo (b) fluoranthene H, C				0.018		23	0%	ND	N/A	0.00613913	NP	0.0061619
Benzo (ghi) perylene H, C						23	0%	ND	N/A	0.00613913	NP	0.0061619
Benzo (k) fluoranthene H, C				0.018		23	0%	ND	N/A	0.00613913	NP	0.0061619
Chrysene H, C				0.018		23	0%	ND	N/A	0.00613913	NP	0.0061619
Dibenzo (a,h) anthracene H, C				0.018		23	0%	ND	N/A	0.01229348	NP	0.012338
Fluoranthene H		54		140		23	4%	0.0133	Location 19	0.00645435	NP	0.0070409
Fluorene L				5300		23	0%	ND	N/A	0.00613913	NP	0.0061619
Indeno (1,2,3-cd) pyrene H, C				0.018		23	0%	ND	N/A	0.00613913	NP	0.0061619
Naphthalene L	620					23	0%	ND	N/A	0.00640435	NP	0.0069053
Phenanthrene L						23	0%	ND	N/A	0.00613913	NP	0.0061619
Pyrene H				4,000		23	0%	ND	N/A	0.00613913	NP	0.0061619
Total LPAHs						23	0%	ND	N/A	0.01855	NP	0.0188105
Total HPAHs						23	4%	0.034375	Location 3	0.03290217	NP	0.0342892
Total CPAHs		0.031				23	0%	ND	N/A	0.02763261	NP	0.0277333
Total PAHs						23	4%	0.0553	Location 7	0.05066304	NP	0.0533144
Field Parameters (pre-/post-sample)												
Temperature (°C)												
Specific Conductance (mS/cm)												
Dissolved Oxygen (mg/L)												
pH												
Oxidation Reduction Potential (mV)												
Turbidity (NTU)												

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION																Location 1		Location 2							
Sample Type																Surface Water		Surface Water		Inter-Armoring		Sub-Armoring			
Sample ID																MBSW0307-01		MBSW0307-02		MBIA0307-02		MBSA0307-02			
Sample Date		Inter-Armoring Water Statistics							Sub-Armoring Water Statistics							3/16/2007		3/16/2007		3/16/2007		3/16/2007			
Sample Time																8:15		8:30		9:00		8:45			
CONTAMINANT OF INTEREST		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value										
Total Suspended Solids (mg/L)		23	100%	302	Location 7	75.913043	NP	285.68017	23	78%	149	Location 15	51.91087	Gamma	88.65448	11		6	J	7	J	33			
Dissolved Metals (mg/L)																									
Arsenic		23	91%	0.00004	Location 10	0.00004	NP	0.00118	23	91%	0.00146	Location 11	0.00119	Gamma	0.01307	0.000260	J	0.000190	J	0.000230	J	0.00479			
Chromium (III)		23	0%	ND	N/A	0.00018	Normal	0.00020	23	9%	0.00055	Location 21	0.00025	NP	0.00113	0.000470	J	0.000420	J	0.000480	U	0.000710	U		
Copper		23	100%	0.00068	Location 10	0.00068	Normal	0.00095	23	48%	0.00043	Location 15	0.00019	NP	0.00088	0.000530	J	0.000590	J	0.000670	J	0.000750	J		
Zinc		23	70%	0.00385	Location 10	0.00090	Normal	0.00410	23	87%	0.00535	Location 10	0.00198	NP	0.01862	0.00173	J	0.00233	J	0.00606	J	0.0120			
Total Metals (mg/L)																									
Arsenic		23	13%	0.00713	Location 5	0.00066	NP	0.00379	23	100%	0.05220	Location 3	0.00798	Gamma	0.01233	0.00021	J	0.00023	J	0.00025	UJ	0.00467			
Chromium (III)		23	13%	0.02270	Location 5	0.00205	Gamma	0.00396	23	30%	0.00255	Location 15	0.00056	NP	0.00218	0.00015	UJ	0.00015	UJ	0.00015	UJ	0.00015	UJ		
Copper		23	100%	0.03700	Location 5	0.00525	NP	0.01241	23	96%	0.54400	Location 15	0.02533	NP	0.25996	0.00144		0.00126		0.00147		0.00163			
Zinc		23	4%	0.03325	Location 5	0.00511	NP	0.02055	23	57%	0.05260	Location 15	0.00984	NP	0.03502	0.00401	J	0.00392	J	0.00548	U	0.0126			
Pentachlorophenol (ug/L)		23	0%	ND	N/A	0.1228478	NP	0.1233257	23	0%	ND	N/A	0.3853913	NP	1.527544	0.245	U	0.243	U	0.245	U	0.246	U		
Polyaromatic Hydrocarbons (ug/L)																									
Acenaphthene	L	23	13%	0.115	Location 20	0.0142891	NP	0.0375184	23	78%	47.5	Location 8	8.4306087	Gamma	23.017762	0.0123	U	0.0121	U	0.0123	U	0.264			
Acenaphthylene	L	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	13%	0.605	Location 16	0.0581217	NP	0.3422935	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Anthracene	L	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	52%	1.32	Location 5	0.0937935	NP	0.6669787	0.0123	U	0.0121	U	0.0123	U	0.0184	J		
Benzo (a) anthracene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	13%	0.3065	Location 5	0.0218326	NP	0.0786941	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Benzo (a) pyrene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	4%	0.3065	Location 5	0.0198739	NP	0.0767302	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Benzo (b) fluoranthene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	4%	0.3065	Location 5	0.02	NP	0.0768605	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Benzo (ghi) perylene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	4%	0.3065	Location 5	0.0204304	NP	0.0773454	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Benzo (k) fluoranthene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	4%	0.3065	Location 5	0.0202174	NP	0.0770977	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Chrysene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	13%	0.3065	Location 5	0.0222022	NP	0.0790195	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Dibenzo (a,h) anthracene	H, C	23	0%	ND	N/A	0.0122848	NP	0.0123326	23	4%	0.615	Location 5	0.039663	NP	0.1537591	0.0245	U	0.0243	U	0.0245	U	0.0246	U		
Fluoranthene	H	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	57%	2.75	Location 7	0.1934565	NP	1.4338639	0.0123	U	0.0121	U	0.0123	U	0.0254			
Fluorene	L	23	9%	0.0345	Location 20	0.0077543	NP	0.0101253	23	65%	20.3	Location 5	1.9031043	NP	12.450431	0.0123	U	0.0121	U	0.0123	U	0.105			
Indeno (1,2,3-cd) pyrene	H, C	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	4%	0.3065	Location 5	0.0204783	NP	0.0774106	0.0123	U	0.0121	U	0.0123	U	0.0123	U		
Naphthalene	L	23	0%	ND	N/A	0.0065674	NP	0.0073668	23	26%	848	Location 5	69.123457	NP	150.01959	0.0123	U	0.0121	U	0.0123	U	0.0157	U		
Phenanthrene	L	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	39%	17	Location 5	0.989637	NP	8.5384859	0.0123	U	0.0121	U	0.0123	U	0.0232	J		
Pyrene	H	23	0%	ND	N/A	0.0061435	NP	0.0061656	23	43%	1.31	Location 7	0.0895478	NP	0.6575389	0.0123	U	0.0121	U	0.0123	U	0.0165	J		
Total LPAHs		23	17%	0.1495	Location 20	0.0263174	NP	0.0524483	23	87%	928.12	Location 5	80.495851	NP	161.80147	0.0369	U	0.0363	U	0.0369	U	0.3056	J		
Total HPAHs		23	0%	ND	N/A	0.0339217	NP	0.0341998	23	57%	4.1375	Location 7	0.2928185	NP	2.0888127	0.0676	U	0.0666	U	0.0738	U	0.0419			
Total CPAHs		23	0%	ND	N/A	0.0276446	Normal	0.0277462	23	13%	1.38025	Location 5	0.0971543	NP	0.3538238	0.0553	U	0.0545	U	0.0553	U	0.0554	U		
Total PAHs		23	17%	0.1495	Location 20	0.0542478	NP	0.0630759	23	91%	929.17	Location 5	80.7797	NP	163.05053	0.1045	U	0.1029	U	0.1045	U	0.4525	J		
Field Parameters (pre-/post-sample)																									
Temperature (°C)																8.83		9.05		9.13 / 9.10		9.20 / 9.27			
Specific Conductance (mS/cm)																0.055		0.056		0.063 / 0.056		0.366 / 0.362			
Dissolved Oxygen (mg/L)																12.39		11.5		11.44 / 11.50		1.20 / 0.77			
pH																7.9		7.51		7.42 / 7.16		6.88 / 6.87			
Oxidation Reduction Potential (mV)																-13.2		39.8		-53.7 / -14.7		-36.1 / -38.5			
Turbidity (NTU)																9.93		8.49		13.4 / 9.15		28.7 / 13.6			

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 3			Location 4			Location 5		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-3	MBIA0307-3	MBSA0307-3	MBSW0307-04	MBIA0307-04	MBSA0307-04	MBSW0307-05	MBIA0307-05	MBSA0307-05
Sample Date		3/14/2007	3/14/2007	3/14/2007	3/16/2007	3/16/2007	3/16/2007	3/16/2007	3/16/2007	3/16/2007
Sample Time		13:40	14:15	13:50	11:45	12:00	12:15	13:15	13:30	13:45
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		8 J	14	47	7 J	265	66	8 J	234	143
Dissolved Metals (mg/L)										
Arsenic		0.000190 J	0.000200 J	0.0527	0.000250 J	0.000220 J	0.00977	0.000280 J	0.00419	0.0130
Chromium (III)		0.000260 J	0.000300 U	0.000300 U	0.000450 J	0.000490 U	0.000850 U	0.000440 J	0.000430 U	0.00326
Copper		0.000630 J	0.000760 J	0.000260 U	0.000580 J	0.000740 J	0.00120	0.000530 J	0.000590 J	0.00102
Zinc		0.00248 J	0.00601 J	0.00556 J	0.00205 J	0.00253 J	0.0151	0.00154 J	0.00551 J	0.0204
Total Metals (mg/L)										
Arsenic		0.00022 J	0.00033 J	0.0522	0.00026 J	0.00118 U	0.00972	0.00025 J	0.00713	0.0113
Chromium (III)		0.00015 U	0.00015 U	0.00015 U	0.00015 UJ	0.00792 U	0.00102 U	0.00015 U	0.0227	0.00015 U
Copper		0.00145	0.00219	0.00066 J	0.0013	0.0107	0.00121	0.0014	0.037	0.0011
Zinc		0.0017 U	0.0113	0.0017 U	0.00342 J	0.0188 U	0.0132	0.0017 U	0.0665 U	0.0187
Pentachlorophenol (ug/L)		0.25 U	0.249 U	0.25 U	0.244 U	0.245 U	0.245 U	0.245 U	0.245 U	12.3 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0125 U	0.0124 U	3.53	0.0122 U	0.0123 U	0.0249	0.0123 U	0.0674	41.5
Acenaphthylene	L	0.0125 U	0.0124 U	0.025 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Anthracene	L	0.0125 U	0.0124 U	0.0349	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	1.32
Benzo (a) anthracene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Benzo (a) pyrene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Benzo (b) fluoranthene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Benzo (ghi) perylene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Benzo (k) fluoranthene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Chrysene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Dibenzo (a,h) anthracene	H, C	0.025 U	0.0249 U	0.025 U	0.0244 U	0.0245 U	0.0245 U	0.0245 U	0.0245 U	1.23 U
Fluoranthene	H	0.0125 U	0.0124 U	0.0139 J	0.0122 U	0.0123 U	0.0129 J	0.0123 U	0.0123 U	1.05 J
Fluorene	L	0.0125 U	0.0124 U	0.812	0.0122 U	0.0123 U	0.018 J	0.0123 U	0.0123 U	20.3
Indeno (1,2,3-cd) pyrene	H, C	0.0125 U	0.0124 U	0.0125 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Naphthalene	L	0.0125 U	0.0124 U	0.0916 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0318 U	848
Phenanthrene	L	0.0125 U	0.0124 U	0.0178 J	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	17
Pyrene	H	0.0125 U	0.0124 U	0.014 J	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0123 U	0.613 U
Total LPAHs		0.0375 U	0.0372 U	4.3947	0.0366 U	0.0369 U	0.0429	0.0369 U	0.0674	928.12
Total HPAHs		0.0688 U	0.0683 U	0.0279	0.0671 U	0.0676 U	0.0129	0.0676 U	0.0676 U	1.05
Total CPAHs		0.0563 U	0.0559 U	0.0563 U	0.0549 U	0.0553 U	0.0553 U	0.0553 U	0.0553 U	2.7605 U
Total PAHs		0.1063 U	0.1055 U	4.4226 J	0.1037 U	0.1045 U	0.0558	0.1045 U	0.0674	929.17
Field Parameters (pre-/post-sample)										
Temperature (°C)		10.04	10.01 / 9.94	10.09 / 10.18	10.15	9.52 / 9.71	9.62 / 9.93	10.32	9.94 / 10.12	10.43 / 10.43
Specific Conductance (mS/cm)		0.054	0.057 / 0.053	0.253 / 0.250	0.055	0.068 / 0.054	0.581 / 0.602	0.055	0.070 / 0.087	0.667 / 0.683
Dissolved Oxygen (mg/L)		11.15	11.75 / 11.53	0.30 / 0.29	11.09	11.66 / 11.52	2.15 / 1.18	12.05	12.00 / 10.65	0.86 / 0.69
pH		7.32	7.04 / 7.06	6.65 / 6.65	7.74	7.99 / 7.81	7.49 / 7.39	7.73	7.96 / 7.11	7.24 / 7.34
Oxidation Reduction Potential (mV)		32.1	-49.1 / -14.5	-62.1 / -86.3	-21.7	-91.3 / -53.4	-78.6 / -84.7	6.3	-93.5 / -54.9	-79.9 / -99.8
Turbidity (NTU)		11.2	18.6 / 12.3	35.3 / 8.66	9.04	69.4 / 50.5	11 / 2.3	5.78	37.5 / 40.7	13.9 / 7.74

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 6			Location 7			Location 8		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-06	MBIA0307-06	MBSA0307-06	MBSW0307-07	MBIA0307-07	MBSA0307-07	MBSW0307-08	MBIA0307-08	MBSA0307-08
Sample Date		3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007
Sample Time		11:05	11:55	11:30	9:40	10:15	10:00	8:10	9:00	8:45
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		12	222	81	7 J	302	2.38 U	5 J	12	2.38 U
Dissolved Metals (mg/L)										
Arsenic		0.000210 J	0.000360 J	0.0115	0.000170 J	0.000650 J	0.00404	0.000200 J	0.000220 J	0.000940 J
Chromium (III)		0.000320 J	0.000170 U	0.00106 U	0.000400 J	0.000600 U	0.000310 U	0.000320 J	0.000100 U	0.000340 U
Copper		0.000670 J	0.000790 J	0.000840 J	0.000550 J	0.00226	0.000440 U	0.000550 J	0.000590 J	0.000370 U
Zinc		0.00184 J	0.00400 J	0.0112	0.00325 J	0.00939 J	0.0102	0.0225	0.00239 U	0.0102
Total Metals (mg/L)										
Arsenic		0.00041 J	0.00175 U	0.0113	0.00029 J	0.00064 U	0.00384	0.00026 J	0.00026 U	0.00083 J
Chromium (III)		0.00142	0.00944 U	0.00015 UJ	0.00015 U	0.00249 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U
Copper		0.00154	0.0134	0.00057 J	0.00126	0.0036	0.00086 J	0.00151	0.00158	0.00027 J
Zinc		0.00487 J	0.0242 U	0.0112 J	0.0017 U	0.0017 U	0.0165	0.0017 U	0.0017 U	0.0017 U
Pentachlorophenol (ug/L)		0.245 U	0.243 U	0.244 U	0.245 U	0.245 U	0.245 U	0.243 U	0.245 U	0.248 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0123 U	0.0121 U	6.72	0.0123 U	0.0123 U	1.91	0.0121 U	0.0123 U	47.5
Acenaphthylene	L	0.0123 U	0.0121 U	0.0396	0.0123 U	0.0123 U	0.0387	0.0121 U	0.0123 U	0.105
Anthracene	L	0.0123 U	0.0121 U	0.0194 J	0.0123 U	0.0123 U	0.0885	0.0121 U	0.0123 U	0.0405
Benzo (a) anthracene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0416	0.0121 U	0.0123 U	0.0124 U
Benzo (a) pyrene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0121 U	0.0123 U	0.0124 U
Benzo (b) fluoranthene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0121 U	0.0123 U	0.0124 U
Benzo (ghi) perylene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0121 U	0.0123 U	0.0124 U
Benzo (k) fluoranthene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0121 U	0.0123 U	0.0124 U
Chrysene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0359	0.0121 U	0.0123 U	0.0124 U
Dibenzo (a,h) anthracene	H, C	0.0245 U	0.0243 U	0.0244 U	0.0245 U	0.0245 U	0.0245 U	0.0243 U	0.0245 U	0.0248 U
Fluoranthene	H	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	2.75	0.0121 U	0.0123 U	0.0216 J
Fluorene	L	0.0123 U	0.0121 U	0.576	0.0123 U	0.0123 U	0.161	0.0121 U	0.0123 U	0.0124 U
Indeno (1,2,3-cd) pyrene	H, C	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	0.0123 U	0.0121 U	0.0123 U	0.0124 U
Naphthalene	L	0.0123 U	0.0121 U	5.87	0.0245 U	0.0123 U	0.0561 U	0.0121 U	0.0123 U	385
Phenanthrene	L	0.0123 U	0.0121 U	0.0399	0.0123 U	0.0123 U	0.0268	0.0121 U	0.0123 U	0.0124 U
Pyrene	H	0.0123 U	0.0121 U	0.0122 U	0.0123 U	0.0123 U	1.31	0.0121 U	0.0123 U	0.0129 J
Total LPAHs		0.0369 U	0.0363 U	13.2649	0.0430 U	0.0369 U	2.2250	0.0363 U	0.0369 U	432.6455
Total HPAHs		0.0676 U	0.0666 U	0.0671 U	0.0676 U	0.0676 U	4.1375	0.0666 U	0.0676 U	0.0345
Total CPAHs		0.0553 U	0.0545 U	0.0549 U	0.0553 U	0.0553 U	0.0775	0.0545 U	0.0553 U	0.0558 U
Total PAHs		0.1045 U	0.1029 U	13.2649	0.1106 U	0.1045 U	6.3625	0.1029 U	0.1045 U	432.6800
Field Parameters (pre-/post-sample)										
Temperature (°C)		9.93	9.50 / 9.72	9.56 / 9.75	9.27	9.41 / 9.63	9.56 / 9.51	8.90	9.31 / 9.51	8.97 / 9.17
Specific Conductance (mS/cm)		0.056	0.068 / 0.072	0.552 / 0.516	0.055	0.061 / 0.056	0.448 / 0.517	0.066	0.063 / 0.055	0.219 / 0.329
Dissolved Oxygen (mg/L)		11.86	9.99 / 8.26	0.78 / 0.99	11.80	11.66 / 11.84	0.75 / 0.59	12.40	11.55 / 11.59	3.18 / 2.54
pH		7.51	7.45 / 7.20	6.72 / 6.85	7.42	7.68 / 7.43	6.85 / 6.92	8.02	7.59 / 7.57	7.05 / 7.26
Oxidation Reduction Potential (mV)		24.0	-85.1 / -40.1	-72.1 / -104.2	115.4	-42.9 / 7.42	64.8 / -9.6	-59.4	70.7 / 91.1	-34.9 / 113.2
Turbidity (NTU)		9.96	104.8 / 70.8	1.94 / 1.28	8.52	32.4 / 119	5.04 / 1.58	8.73	16.0 / 8.93	2.27 / 1.64

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 9			Location 9 (Dup)	Location 10			Location 11		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-9	MBIA0307-9	MBSA0307-9	MBSA0307-28	MBSW0307-10	MBIA0307-10	MBSA0307-10	MBSW0307-11	MBIA0307-11	MBSA0307-11
Sample Date		3/14/2007	3/14/2007	3/14/2007	3/14/2007	3/13/2007	3/13/2007	3/13/2007	3/13/2007	3/13/2007	3/13/2007
Sample Time		8:00	9:10	8:35	7:15	9:45	10:15	10:00	9:00	9:30	9:15
CONTAMINANT OF INTEREST											
Total Suspended Solids (mg/L)		8 J	29	32	68	3 J	9 J	2.38 U	7 J	8 J	5 J
Dissolved Metals (mg/L)											
Arsenic		0.000200 J	0.000170 J	0.00231	0.00229	0.0000800 U	0.0000800 U	0.00182 U	0.0000800 U	0.0000800 U	0.00292 U
Chromium (III)		0.000290 J	0.000280 U	0.000300 U	0.000230 U	0.00039 J	0.0004 U	0.00034 U	0.000510 J	0.000390 U	0.00031 U
Copper		0.000600 J	0.000660 J	0.000280 U	0.000580 J	0.00053 J	0.00068 J	0.00042 U	0.000560 J	0.000830 J	0.00024 U
Zinc		0.00357 J	0.00327 J	0.00304 J	0.00257 J	0.00158 J	0.00385 J	0.00535 J	0.00179 J	0.00430 J	0.00449 J
Total Metals (mg/L)											
Arsenic		0.00027 J	0.00037 U	0.00223 J	0.0022	0.00029 J	0.00021 U	0.00175	0.00022 J	0.00023 U	0.00297
Chromium (III)		0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00109	0.00118 U	0.00072 U
Copper		0.00139	0.00242	0.00142	0.00169	0.00128	0.00145	0.00008 U	0.00133	0.0016	0.0007 J
Zinc		0.0017 U	0.0106 U	0.0017 U	0.0112	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Pentachlorophenol (ug/L)		0.246 U	0.245 U	0.248 U	0.244 U	0.243 U	0.242 U	0.243 U	0.243 U	0.243 U	0.244 U
Polyaromatic Hydrocarbons (ug/L)											
Acenaphthene	L	0.0123 U	0.0123 U	3.41	2.95	0.0121 U	0.0121 U	0.0122 J	0.0121 U	0.0121 U	0.67
Acenaphthylene	L	0.0123 U	0.0123 U	0.0124 U	0.0244 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0122 U
Anthracene	L	0.0123 U	0.0123 U	0.0151 J	0.0129 J	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0122 U
Benzo (a) anthracene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0171 J	0.0121 U	0.0121 U	0.0122 U
Benzo (a) pyrene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0207 J	0.0121 U	0.0121 U	0.0122 U
Benzo (b) fluoranthene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0236 J	0.0121 U	0.0121 U	0.0122 U
Benzo (ghi) perylene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0335	0.0121 U	0.0121 U	0.0122 U
Benzo (k) fluoranthene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0286	0.0121 U	0.0121 U	0.0122 U
Chrysene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0311	0.0121 U	0.0121 U	0.0122 U
Dibenzo (a,h) anthracene	H, C	0.0246 U	0.0245 U	0.0248 U	0.0244 U	0.0243 U	0.0242 U	0.038 J	0.0243 U	0.0243 U	0.0244 U
Fluoranthene	H	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0125 J	0.0121 U	0.0121 U	0.14
Fluorene	L	0.0123 U	0.0123 U	0.641	0.544	0.0121 U	0.0121 U	0.0568	0.0121 U	0.0121 U	0.03
Indeno (1,2,3-cd) pyrene	H, C	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.035	0.0121 U	0.0121 U	0.0122 U
Naphthalene	L	0.0123 U	0.0123 U	0.25 U	0.221 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0144 U
Phenanthrene	L	0.0123 U	0.0123 U	0.0627	0.0533	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0122 U
Pyrene	H	0.0123 U	0.0123 U	0.0124 U	0.0122 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0121 U	0.0811
Total LPAHs		0.0369 U	0.0369 U	4.1288	3.7812	0.0363 U	0.0363 U	0.0690	0.0363 U	0.0363 U	0.7000
Total HPAHs		0.0677 U	0.0676 U	0.0682 U	0.0671 U	0.0666 U	0.0666 U	0.2230	0.0666 U	0.0666 U	0.2211
Total CPAHs		0.0554 U	0.0553 U	0.0558 U	0.0549 U	0.0545 U	0.0545 U	0.2105	0.0545 U	0.0545 U	0.0549 U
Total PAHs		0.1046 U	0.1045 U	4.1288	3.7812	0.1029 U	0.1029 U	0.2920	0.1029 U	0.1029 U	0.9211
Field Parameters (pre-/post-sample)											
Temperature (°C)		9.44	9.56 / 9.57	9.42 / 9.5		9.16	9.44 / 9.49	9.60 / 9.55	9.82	9.51 / 9.47	9.55 / 9.47
Specific Conductance (mS/cm)		0.058	0.054 / 0.054	0.146 / 0.178		0.059	0.058 / 0.057	0.072 / 0.095	0.057	0.080 / 0.056	0.210 / 0.210
Dissolved Oxygen (mg/L)		11.31	11.49 / 11.47	2.81 / 2.51		12.70	10.66 / 11.76	2.05 / 1.07	11.52	9.62 / 11.65	0.53 / 0.37
pH		7.62	6.97 / 6.98	6.7 / 6.66		7.65	7.17 / 7.19	7.10 / 7.02	7.31	7.30 / 7.21	6.94 / 7.07
Oxidation Reduction Potential (mV)		35.8	-15.1 / 11.2	6.3 / -62.5		35.4	27.2 / 62.7	261.8 / 52.6	13.1	-54.2 / -35.9	13.1 / -65.0
Turbidity (NTU)		11.5	30.1 / 15.9	68.3 / 16.8		8.66	12.2 / 8.61	5.16 / 4.53	8.53	43.8 / 43.8	3.75 / 8.87

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 12			Location 12 (Dup)	Location 13			Location 14		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-12	MBIA0307-12	MBSA0307-12	MBSW0307-42	MBSW0307-13	MBIA0307-13	MBSA0307-13	MBSW0307-14	MBIA0307-14	MBSA0307-14
Sample Date		3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007	3/12/2007
Sample Time		13:30	13:40	13:50	0:00	11:45	11:50	12:00	15:00	15:15	15:30
CONTAMINANT OF INTEREST											
Total Suspended Solids (mg/L)		7 J	43	95	4 J	6 J	87	131	8 J	30	7 J
Dissolved Metals (mg/L)											
Arsenic		0.000160 J	0.000240 J	0.0310	0.000240 J	0.00008 U	0.000210 J	0.00733	0.000180 J	0.000180 J	0.00520
Chromium (III)		0.000240 J	0.000280 U	0.000560 U	0.000310 J	0.000340 J	0.000240 U	0.000640 U	0.000300 J	0.000300 U	0.000680 U
Copper		0.000430 J	0.000870 J	0.000390 U	0.000410 J	0.000520 J	0.000940 J	0.000380 U	0.000490 J	0.000640 J	0.000590 J
Zinc		0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00005 U	0.00930 J
Total Metals (mg/L)											
Arsenic		0.00029 J	0.00073 U	0.0295	0.00023 J	0.00025 J	0.00024 U	0.007	0.00017 J	0.00041 U	0.00485
Chromium (III)		0.00112	0.00307 U	0.00068 U	0.00108	0.0009 J	0.00076 U	0.00118 U	0.00102	0.00224 U	0.00054 U
Copper		0.00125	0.00443	0.012	0.00122	0.00109	0.00156	0.00147	0.00127	0.00308	0.00039 J
Zinc		0.0017 U	0.0129 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Pentachlorophenol (ug/L)		0.248 U	0.249 U	0.249 U	0.249 U	0.249 U	0.249 U	0.249 U	0.249 U	0.249 U	0.249 U
Polyaromatic Hydrocarbons (ug/L)											
Acenaphthene	L	0.0124 U	0.0233 J	42.7	0.0124 U	0.0124 U	0.0124 U	0.16	0.0124 U	0.0124 U	0.0578
Acenaphthylene	L	0.0124 U	0.0124 U	0.249 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Anthracene	L	0.0124 U	0.0124 U	0.0844	0.0124 U	0.0124 U	0.0124 U	0.0498	0.0124 U	0.0124 U	0.0124 U
Benzo (a) anthracene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0194 J	0.0124 U	0.0124 U	0.0124 U
Benzo (a) pyrene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Benzo (b) fluoranthene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Benzo (ghi) perylene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Benzo (k) fluoranthene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Chrysene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0196 J	0.0124 U	0.0124 U	0.0124 U
Dibenzo (a,h) anthracene	H, C	0.0248 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U	0.0249 U
Fluoranthene	H	0.0124 U	0.0124 U	0.0233 J	0.0124 U	0.0124 U	0.0124 U	0.139	0.0124 U	0.0124 U	0.0124 U
Fluorene	L	0.0124 U	0.0124 U	6.92	0.0124 U	0.0124 U	0.0124 U	0.152	0.0124 U	0.0124 U	0.0124 U
Indeno (1,2,3-cd) pyrene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U	0.0124 U
Naphthalene	L	0.0124 U	0.0124 U	5	0.0124 U	0.0124 U	0.0124 U	0.157 U	0.0124 U	0.0124 U	0.0289 U
Phenanthrene	L	0.0124 U	0.0124 U	0.16	0.0124 U	0.0124 U	0.0124 U	0.385	0.0124 U	0.0124 U	0.0124 U
Pyrene	H	0.0124 U	0.0124 U	0.0216 J	0.0124 U	0.0124 U	0.0124 U	0.095	0.0124 U	0.0124 U	0.0124 U
Total LPAHs		0.0372 U	0.0233 J	54.8644	0.0372 U	0.0372 U	0.0372 U	0.7468	0.0372 U	0.0372 U	0.0578
Total HPAHs		0.0682 U	0.0683 U	0.0449	0.0683 U	0.0683 U	0.0683 U	0.2730	0.0683 U	0.0683 U	0.0683 U
Total CPAHs		0.0558 U	0.0559 U	0.0559 U	0.0559 U	0.0559 U	0.0559 U	0.0390	0.0559 U	0.0559 U	0.0559 U
Total PAHs		0.1054 U	0.0233 J	54.9093	0.1055 U	0.1055 U	0.1055 U	1.0198	0.1055 U	0.1055 U	0.0578
Field Parameters (pre-/post-sample)											
Temperature (°C)		9.29	9.40 / 9.41	9.29 / 9.38		9.31	9.24 / 9.32	10.12 / 10.16	9.90	9.67 / 9.55	10.09 / 9.96
Specific Conductance (mS/cm)		0.060	0.070 / 0.064	0.514 / 0.523		0.061	0.069 / 0.064	0.529 / 0.529	0.061	0.076 / 0.060	0.466 / 0.563
Dissolved Oxygen (mg/L)		10.74	11.06 / 11.19	0.75 / 0.63		11.65	10.99 / 10.65	0.42 / 0.81	11.40	11.69 / 11.58	1.57 / 2.12
pH		6.74	6.96 / 6.64	6.65 / 6.77		6.91	6.91 / 6.60	6.54 / 6.63	6.78	7.50 / 7.36	6.75 / 6.98
Oxidation Reduction Potential (mV)		41.3	-39.0 / -5.0	-109.5 / -134.5		18.3	-29.9 / -1.5	-80.9 / -106.9	26.9	-45.6 / -1.8	-5.7 / -36.9
Turbidity (NTU)		11.4	59.9 / 22.4	8.31 / 5.78		8.93	93.5 / 52.8	8.59 / 8.59	11.2	43.2 / 10.64	4.99 / 2.73

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 15			Location 16			Location 17		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-15	MBIA0307-15	MBSA0307-15	MBSW0307-16	MBIA0307-16	MBSA0307-16	MBSW0307-17	MBIA0307-17	MBSA0307-17
Sample Date		3/14/2007	3/14/2007	3/14/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007
Sample Time		10:30	11:25	10:50	13:15	14:15	14:00	16:05	16:45	16:15
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		7 J	18	149	11	83	116	6 J	13	2.38 U
Dissolved Metals (mg/L)										
Arsenic		0.000200 J	0.000510 J	0.000130 J	0.000270 J	0.000230 J	0.0139	0.000220 J	0.000170 J	0.000890 J
Chromium (III)		0.000280 J	0.000420 U	0.000260 U	0.000310 J	0.000410 U	0.00213	0.000570 J	0.000480 U	0.000360 U
Copper		0.00182	0.000840 J	0.000850 U	0.000600 J	0.000630 J	0.00101	0.000620 J	0.000710 J	0.000290 U
Zinc		0.00379 J	0.00246 J	0.00324 J	0.00409 J	0.00222 U	0.0188	0.00207 J	0.00254 J	0.00563 J
Total Metals (mg/L)										
Arsenic		0.00026 J	0.00051 U	0.00076 J	0.0003 J	0.00069 U	0.0133	0.00027 J	0.00017 U	0.00287
Chromium (III)		0.00015 U	0.00133 U	0.00255	0.00015 UJ	0.00449 U	0.00015 UJ	0.00015 UJ	0.00125 U	0.00219 U
Copper		0.00128	0.002	0.544	0.00132	0.00607	0.00111	0.00121	0.00147	0.00145
Zinc		0.0017 U	0.0017 U	0.0526	0.00284 J	0.0106 U	0.0179	0.0076 J	0.00404 U	0.0158
Pentachlorophenol (ug/L)		0.248 U	0.249 U	0.249 U	0.245 U	0.244 U	0.243 U	0.246 U	0.244 U	0.243 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	44.6	0.0123 U	0.0122 U	0.443
Acenaphthylene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	1.21 U	0.0123 U	0.0122 U	0.0121 U
Anthracene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.338	0.0123 U	0.0122 U	0.0121 U
Benzo (a) anthracene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Benzo (a) pyrene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Benzo (b) fluoranthene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Benzo (ghi) perylene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Benzo (k) fluoranthene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Chrysene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Dibenzo (a,h) anthracene	H, C	0.0248 U	0.0249 U	0.0249 U	0.0245 U	0.0244 U	0.0243 U	0.0246 U	0.0244 U	0.0243 U
Fluoranthene	H	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.121	0.0123 U	0.0122 U	0.0121 U
Fluorene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	13.8	0.0123 U	0.0122 U	0.0778
Indeno (1,2,3-cd) pyrene	H, C	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0121 U	0.0123 U	0.0122 U	0.0121 U
Naphthalene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	345	0.0123 U	0.0122 U	0.0316 U
Phenanthrene	L	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	4.96	0.0123 U	0.0122 U	0.0121 U
Pyrene	H	0.0124 U	0.0124 U	0.0124 U	0.0123 U	0.0122 U	0.0605	0.0123 U	0.0122 U	0.0121 U
Total LPAHs		0.0372 U	0.0372 U	0.0372 U	0.0369 U	0.0366 U	408.698	0.0369 U	0.0366 U	0.5208
Total HPAHs		0.0682 U	0.0683 U	0.0683 U	0.0676 U	0.0671 U	0.1815	0.0677 U	0.0671 U	0.0666 U
Total CPAHs		0.0558 U	0.0559 U	0.0559 U	0.0553 U	0.0549 U	0.0545 U	0.0554 U	0.0549 U	0.0545 U
Total PAHs		0.1054 U	0.1055 U	0.1055 U	0.1045 U	0.1037 U	408.8795	0.1046 U	0.1037 U	0.5208
Field Parameters (pre-/post-sample)										
Temperature (°C)		9.51	9.63 / 9.50	9.47 / 9.47	10.26	9.54 / 9.63	9.74 / 9.89	9.76	9.60 / 9.59	9.61 / 9.60
Specific Conductance (mS/cm)		0.054	0.053 / 0.079	0.069 / 0.072	0.057	0.074 / 0.054	0.747 / 0.751	0.054	0.055 / 0.053	0.178 / 0.188
Dissolved Oxygen (mg/L)		11.63	11.36 / 8.44	3.53 / 3.08	12.77	9.69 / 11.55	1.17 / 0.80	11.17	10.60 / 11.43	1.03 / 1.27
pH		7.16	6.76 / 6.75	6.84 / 6.61	7.88	7.75 / 7.51	6.90 / 7.0	7.23	7.35 / 7.28	7.01 / 7.13
Oxidation Reduction Potential (mV)		18.5	27.3 / 45.1	14.2 / 51.1	-53.3	-106.7 / -79.9	-100.6 / -115	-2.0	-47.0 / -28.5	-14.4 / -57.4
Turbidity (NTU)		8.85	12.6 / 16.4	21 / 30.9	9.41	78.6 / 48.2	2.67 / 2.06	8.41	15.4 / 10.39	73.7 / 33.5

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 17[4]			Location 18			Location 19			Location 19 (Dup)
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring[5]	Sub-Armoring	Inter-Armoring
Sample ID		MBSW0307-17	MBIA0307-17	MBSA0307-17	MBSW0307-18	MBIA0307-18	MBSA0307-18	MBSW0307-19	MBIA0307-19	MBSA0307-19	MBIA0307-29
Sample Date		3/16/2007	3/16/2007	3/16/2007	3/14/2007	3/14/2007	3/14/2007	3/15/2007	3/15/2007	3/15/2007	3/15/2007
Sample Time		14:45	15:00	15:15	12:15	13:05	12:40	14:55	15:20	15:10	7:30
CONTAMINANT OF INTEREST											
Total Suspended Solids (mg/L)		6 J	56	4 J	9 J	7 J	86	11	14	20	16
Dissolved Metals (mg/L)											
Arsenic		0.000210 J	0.000220 J	0.00288	0.000230 J	0.000230 J	0.00107	0.000240 J	0.000200 J	0.00437	0.000280 J
Chromium (III)		0.000100 J	0.000480 U	0.000250 U	0.000250 J	0.000280 U	0.000560 U	0.000430 J	0.000280 U	0.000430 U	0.000290 U
Copper		0.000560 J	0.000790 J	0.000280 U	0.000580 J	0.000710 J	0.00108	0.000660 J	0.000770 J	0.000410 U	0.000670 J
Zinc		0.00187 J	0.00329 J	0.00351 J	0.00339 J	0.00712 J	0.00424 J	0.00184 J	0.00239 U	0.00459 J	0.00303 J
Total Metals (mg/L)											
Arsenic		0.00025 J	0.00059 U	0.00091 J	0.00024 J	0.0002 U	0.00128	0.00035 J	0.00028 UJ	0.00439	0.00034 UJ
Chromium (III)		0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00015 U	0.00245	0.00015 UJ	0.00015 UJ	0.00015 UJ	0.00015 UJ
Copper		0.00149	0.0043	0.00125	0.00126	0.00119	0.00379	0.00315	0.00171	0.00094 J	0.00181
Zinc		0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0267	0.00394 J	0.0059 U	0.00562 J	0.00635 U
Pentachlorophenol (ug/L)		0.246 U	0.244 U	0.244 U	0.249 U	0.248 U	0.25 U	0.243 U	0.245 U	0.246 U	0.245 U
Polyaromatic Hydrocarbons (ug/L)											
Acenaphthene	L	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.153	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Acenaphthylene	L	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Anthracene	L	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0435	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Benzo (a) anthracene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Benzo (a) pyrene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Benzo (b) fluoranthene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Benzo (ghi) perylene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Benzo (k) fluoranthene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Chrysene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Dibenzo (a,h) anthracene	H, C	0.0246 U	0.0244 U	0.0244 U	0.0249 U	0.0248 U	0.025 U	0.0243 U	0.0245 U	0.0246 U	0.0245 U
Fluoranthene	H	0.0123 U	0.0122 U	0.0213 J	0.0124 U	0.0124 U	0.0125 U	0.0133 J	0.0123 U	0.0568	0.0123 U
Fluorene	L	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0147 J	0.0151 J	0.0123 U
Indeno (1,2,3-cd) pyrene	H, C	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Naphthalene	L	0.0123 U	0.0122 U	0.0931 U	0.0124 U	0.0124 U	0.899 U	0.0121 U	0.0123 U	0.0209 U	0.0245 U
Phenanthrene	L	0.0123 U	0.0122 U	0.0122 U	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0123 U	0.0123 U
Pyrene	H	0.0123 U	0.0122 U	0.0139 J	0.0124 U	0.0124 U	0.0125 U	0.0121 U	0.0123 U	0.0536	0.0123 U
Total LPAHs		0.0369 U	0.0366 U	0.0771 U	0.0372 U	0.0372 U	0.1965	0.0363 U	0.0147 J	0.0360	0.0430 U
Total HPAHs		0.0677 U	0.0671 U	0.0352	0.0683 U	0.0682 U	0.0688 U	0.0133 J	0.0676 U	0.1104	0.0676 U
Total CPAHs		0.0554 U	0.0549 U	0.0549 U	0.0559 U	0.0558 U	0.0563 U	0.0545 U	0.0553 U	0.0554 U	0.0553 U
Total PAHs		0.1046 U	0.1037 U	0.0352	0.1055 U	0.1054 U	0.1965	0.0133 J	0.0147 J	0.1464	0.1106 U
Field Parameters (pre-/post-sample)											
Temperature (°C)		11.08	10.4 / 10.4	10.75 / 10.33	9.67	10.16 / 9.94	9.89 / 9.74	10.66	10.60	10.19 / 10.34	
Specific Conductance (mS/cm)		0.059	0.055 / 0.055	0.139 / 0.143	0.054	0.061 / 0.054	0.239 / 0.260	0.054	0.055	0.129 / 0.137	
Dissolved Oxygen (mg/L)		11.18	11.77 / 11.30	0.52 / 0.67	11.63	11.26 / 11.76	0.95 / 0.48	11.27	11.60	1.17 / 0.40	
pH		7.58	7.94 / 7.84	7.49 / 7.90	7.16	7.55 / 7.33	7.17 / 7.16	7.39	7.11	6.91 / 6.94	
Oxidation Reduction Potential (mV)		-43.6	-48.5 / -54.1	19.9 / -63.9	44.6	16.5 / 29.0	42.8 / 19.8	-14.1	-48.5	-68.8 / -64.9	
Turbidity (NTU)		10.15	43.0 / 22.7	23.7 / 20.3	8.47	19.6 / 10.7	81.4 / 20.1	13.0	15.6	78.2 / 11.18	

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 20			Location 21			Location 25		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-20	MBIA0307-20	MBSA0307-20	MBSW0307-21	MBIA0307-21	MBSA0307-21	MBSW0307-25	MBIA0307-25	MBSA0307-25
Sample Date		3/13/2007	3/13/2007	3/13/2007	3/12/2007	3/12/2007	3/12/2007	3/14/2007	3/14/2007	3/14/2007
Sample Time		12:45	13:00	13:15	9:55	10:00	10:10	14:45	15:25	15:00
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		5 J	4 J	45	4 J	263	89	7 J	14	2.38 U
Dissolved Metals (mg/L)										
Arsenic		0.000270 J	0.000180 J	0.000480 J	0.00008 U	0.000230 J	0.00933	0.000270 J	0.000370 J	0.000850 J
Chromium (III)		0.000280 J	0.000400 U	0.000360 U	0.000310 J	0.000180 U	0.00110 U	0.000310 J	0.000290 U	0.000460 U
Copper		0.000670 J	0.000620 J	0.000860 J	0.000510 J	0.000720 J	0.000310 U	0.000630 J	0.000990 J	0.00123
Zinc		0.00255 J	0.00190 U	0.00266 J	0.00005 U	0.00005 U	0.00005 U	0.00184 J	0.00379 J	0.00471 J
Total Metals (mg/L)										
Arsenic		0.00022 J	0.00024 U	0.00095 J	0.00032 J	0.00268	0.00899	0.0003 J	0.00065 U	0.00102
Chromium (III)		0.00015 U	0.00015 U	0.00225	0.00093 J	0.0092 U	0.00049 U	0.00015 U	0.0023 U	0.00141 U
Copper		0.00119	0.00145	0.00487	0.00115	0.014	0.00048 J	0.00184	0.00262	0.00157
Zinc		0.0216	0.0017 U	0.0128	0.0017 U	0.0295 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Pentachlorophenol (ug/L)		0.243 U	0.24 U	0.245 U	0.249 U	0.248 U	0.25 U	0.248 U	0.25 U	0.249 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0121 U	0.115	0.205	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Acenaphthylene	L	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Anthracene	L	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0368	0.0124 U	0.0125 U	0.0124 U
Benzo (a) anthracene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Benzo (a) pyrene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Benzo (b) fluoranthene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Benzo (ghi) perylene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Benzo (k) fluoranthene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Chrysene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Dibenzo (a,h) anthracene	H, C	0.0243 U	0.024 U	0.0245 U	0.0249 U	0.0248 U	0.025 U	0.0248 U	0.025 U	0.0249 U
Fluoranthene	H	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Fluorene	L	0.0121 U	0.0345	0.0571	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Indeno (1,2,3-cd) pyrene	H, C	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Naphthalene	L	0.0121 U	0.012 U	0.0144 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0126 U
Phenanthrene	L	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Pyrene	H	0.0121 U	0.012 U	0.0123 U	0.0124 U	0.0124 U	0.0125 U	0.0124 U	0.0125 U	0.0124 U
Total LPAHs		0.0363 U	0.1495	0.2621	0.0372 U	0.0372 U	0.0368	0.0372 U	0.0375 U	0.0373 U
Total HPAHs		0.0666 U	0.0660 U	0.0676 U	0.0683 U	0.0682 U	0.0688 U	0.0682 U	0.0688 U	0.0683 U
Total CPAHs		0.0545 U	0.0540 U	0.0553 U	0.0559 U	0.0558 U	0.0563 U	0.0558 U	0.0563 U	0.0559 U
Total PAHs		0.1029 U	0.1495	0.2621	0.1055 U	0.1054 U	0.0368	0.1054 U	0.1063 U	0.1056 U
Field Parameters (pre-/post-sample)										
Temperature (°C)		9.85	9.61 / 9.55	9.41 / 9.45	9.46	9.24 / 9.25	10.39 / 10.56	10.07	10.04 / 10.20	10.29 / 10.22
Specific Conductance (mS/cm)		0.056	0.057 / 0.056	0.103 / 0.116	0.064	0.074 / 0.76	0.559 / 0.580	0.053	0.054 / 0.053	0.075 / 0.090
Dissolved Oxygen (mg/L)		11.50	11.55 / 11.68	4.10 / 2.02	12.31	11.30 / 11.50	3.02 / 0.89	11.82	11.89 / 11.06	3.50 / 3.64
pH		7.37	7.10 / 7.20	6.72 / 6.59	7.15	6.84 / 6.82	6.42 / 6.62	7.16	7.20 / 7.25	7.11 / 7.10
Oxidation Reduction Potential (mV)		-16.7	-90.5 / -67.2	-29.9 / -49.7	101.4	-5.5 / 3.1	-42.7 / -104.3	-2.0	50.0 / 39.7	12.9 / 22.7
Turbidity (NTU)		9.25	13.8 / 9.12	59.8 / 42.0	8.42	123 / 92.3	15.9 / 1.97	7.92	8.59 / 17.1	84.3 / 22.9

Table 3-1f
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Spring 2007

SAMPLE LOCATION		Location 26			Location 26 (Dup)	Location 27	Rinsate Blanks	
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0307-26	MBIA0307-26	MBSA0307-26	MBSA0307-35	MBSW0307-27	MBIA0307-RS	MBSA0307-RS
Sample Date		3/16/2007	3/16/2007	3/16/2007	3/16/2007	3/12/2007	3/16/2007	3/16/2007
Sample Time		9:45	10:00	10:15	0:00	9:30	16:30	16:15
CONTAMINANT OF INTEREST								
Total Suspended Solids (mg/L)		9 J	10	3	2.38 U	6 J	2.38 U	2.38 U
Dissolved Metals (mg/L)								
Arsenic		0.000190 J	0.000320 J	0.00630	0.00630	0.000100 J	0.0008 U	0.00008 U
Chromium (III)		0.000370 J	0.000420 U	0.000490 U	0.000420 U	0.000340 J	0.000260 J	0.000270 J
Copper		0.000650 J	0.00116	0.000630 J	0.000160 J	0.000550 J	0.00007 U	0.0000900 J
Zinc		0.00183 J	0.00351 J	0.00178 J	0.00205 J	0.00005 U	0.000480 J	0.000320 J
Total Metals (mg/L)								
Arsenic		0.00033 J	0.00026 U	0.0068	0.00627	0.00023 J	0.00014 U	0.00014 U
Chromium (III)		0.00165 J	0.00139 U	0.00087 U	0.00015 U	0.00114	0.00044 J	0.00044 J
Copper		0.0013 J	0.0014	0.00048 J	0.00021 J	0.00168	0.00439	0.00008 U
Zinc		0.00299 J	0.00479 U	0.00306 J	0.0017 U	0.0017 U	0.0148	0.0017 U
Pentachlorophenol (ug/L)		0.244 U	0.245 U	0.245 U	0.249 U	0.249 U	0.244 U	0.244 U
Polyaromatic Hydrocarbons (ug/L)								
Acenaphthene	L	0.0122 U	0.0123 U	0.0132 J	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Acenaphthylene	L	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Anthracene	L	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Benzo (a) anthracene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Benzo (a) pyrene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Benzo (b) fluoranthene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Benzo (ghi) perylene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Benzo (k) fluoranthene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Chrysene	H, C	0.0122 U	0.0123 U	0.0132 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Dibenzo (a,h) anthracene	H, C	0.0244 U	0.0245 U	0.0245 U	0.0249 U	0.0249 U	0.0244 U	0.0244 U
Fluoranthene	H	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Fluorene	L	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Indeno (1,2,3-cd) pyrene	H, C	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Naphthalene	L	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0189 J	0.525	0.515
Phenanthrene	L	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Pyrene	H	0.0122 U	0.0123 U	0.0123 U	0.0124 U	0.0124 U	0.0122 U	0.0122 U
Total LPAHs		0.0366 U	0.0369 U	0.0132 J	0.0372 U	0.0189 J	0.5250	0.5150
Total HPAHs		0.0671 U	0.0676 U	0.0703 U	0.0683 U	0.0683 U	0.0671 U	0.0671 U
Total CPAHs		0.0549 U	0.0553 U	0.0580 U	0.0559 U	0.0559 U	0.0549 U	0.0549 U
Total PAHs		0.1037 U	0.1045 U	0.0132 J	0.1055 U	0.0189 J	0.5250	0.5150
Field Parameters (pre-/post-sample)								
Temperature (°C)		9.14	9.26 / 9.56	9.29 / 9.26		9.49		
Specific Conductance (mS/cm)		0.054	0.172 / 0.002	0.056 / 0.053		0.098		
Dissolved Oxygen (mg/L)		11.68	0.69 / 1.50	9.74 / 10.86		10.42		
pH		7.09	7.11 / 6.34	7.42 / 7.43		7.32		
Oxidation Reduction Potential (mV)		25.4	-67.5 / -51.9	-55.6 / -42.6		117.5		
Turbidity (NTU)		8.93	2.81 / 5.12	10.66 / 8.16		8.34		

Table 3-1f
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data Table Notes and Key
Spring 2007

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

[4] Location 17 sampled twice, both samples are included in the result table. This is not a duplicate sample because sampling equipment was removed and re-installed between the two samples.

[5] No post sampling water quality parameter because the inter-armoring sampling device was removed prematurely.

ADDITIONAL NOTES:

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

Summary results for a number of inter-armoring and sub-armoring samples from the Spring 2007 sampling event (shown in table 3-1f) were revised during data review as a result of the detection of naphthalene in a field rinsate sample. Original laboratory data reports are provided as an appendix to this report. Samples include inter-armoring sample IA-0307-5 and sub-armoring samples SA-0307-2, 3, 7, 9, 11, 13, 14, 17 (both samples), 18, 19, 20, 25, and 28 (a duplicate from location 9). Detections reported by the laboratory at less than 5 times the rinsate blank concentration were changed to 'U' values in accordance with data review guidelines. Such values were all well below the reference criteria for naphthalene.

KEY:

AWQC	Ambient Water Quality Criteria
C	Carcinogenic PAH (CPAH)
EPA	Environmental Protection Agency
H	High Molecular Weight PAH (HPAH)
J	Estimated Value
L	Low Molecular Weight PAH (LPAH)
MCL	Drinking Water Maximum Contaminant Levels
MRL	Method Reporting Limit
MDL	Method Detection Limit
mg/L	milligrams per liter
NRWQC	National Recommended Water Quality Criteria
NPDWR	National Primary Drinking Water Regulations
PAH	Polyaromatic Hydrocarbons
ROD	Record of Decision
U	Value Below MDL (value represents MDL)
UJ	Value Below Estimated MDL (value represents estimated MDL)
ug/L	micrograms per liter
Gamma	Gamma Distribution
N/A	Not applicable
NP	Non-parametric Distribution

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Sediment Cap Performance Goals		Comparison Criteria									
Sample Type Sample ID Sample Date Sample Time		McCormick & Baxter Record of Decision, 1996, *Ambient Water Quality Criteria (AWQCs)*		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Surface Water Statistics						
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	*Human Health* (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids (mg/L)							22	91%	86	Location 25	19.0427273	Log	36.449153
Dissolved Metals (mg/L)													
Arsenic							22	9%	0.000967	Location 17	0.00039527	NP	0.00046
Chromium (III)							22	0%	ND	N/A	0.0000605	–	–
Copper							22	95%	0.00103	Location 25	0.00066907	Normal	0.00723
Zinc							22	73%	0.0058	Location 2	0.00238402	NP	0.00361
Total Metals (mg/L)													
Arsenic		0.19		0.15	0.00014	0.01	22	100%	0.00143	Location 17	0.00070068	NP	0.00105
Chromium (III)		0.21		0.074		0.1	22	55%	0.000825	Location 10	0.00030064	Log	0.00043
Copper		0.012		0.009			22	86%	0.00223	Location 12	0.00121386	Normal	0.00136
Zinc		0.11		0.12	26		22	68%	0.00445	Location 12	0.00273468	Max	0.00445
Pentachlorophenol (ug/L)		13		11	3	1	22	0%	ND	N/A	0.11893182	NP	0.119089
Polyaromatic Hydrocarbons (ug/L)													
Acenaphthene	L	520			990		22	45%	0.411	Location 12	0.06806364	NP	0.3359264
Acenaphthylene	L						22	9%	0.0581	Location 17	0.00875682	NP	0.0191793
Anthracene	L				40,000		22	0%	ND	N/A	0.00593864	NP	0.0059499
Benzo (a) anthracene	H, C				0.018		22	0%	ND	N/A	0.00593864	NP	0.0059499
Benzo (a) pyrene	H, C				0.018	0.2	22	0%	ND	N/A	0.00593864	NP	0.0059499
Benzo (b) fluoranthene	H, C				0.018		22	0%	ND	N/A	0.00593864	NP	0.0059499
Benzo (ghi) perylene	H, C						22	0%	ND	N/A	0.00593864	NP	0.0059499
Benzo (k) fluoranthene	H, C				0.018		22	0%	ND	N/A	0.00593864	NP	0.0059499
Chrysene	H, C				0.018		22	0%	ND	N/A	0.00593864	NP	0.0059499
Dibenzo (a,h) anthracene	H, C				0.018		22	0%	ND	N/A	0.01189091	NP	0.011907
Fluoranthene	H		54		140		22	14%	0.0286	Location 12	0.00837955	NP	0.0108649
Fluorene	L				5300		22	27%	0.254	Location 17	0.02945	NP	0.1573599
Indeno (1,2,3-cd) pyrene	H, C				0.018		22	0%	ND	N/A	0.00593864	NP	0.0059499
Naphthalene	L	620					22	50%	1.33	Location 7	0.19369545	NP	1.0254965
Phenanthrene	L						22	23%	0.073	Location 17	0.01479773	NP	0.031925
Pyrene	H				4,000		22	14%	0.0277	Location 12	0.00834773	NP	0.0108188
Total LPAHs							22	68%	1.9901	Location 17	0.29716136	NP	1.4618828
Total HPAHs							22	14%	0.0563	Location 12	0.0345375	NP	0.0368851
Total CPAHs			0.031				22	0%	ND	N/A	0.02673068	NP	0.0267776
Total PAHs							22	68%	1.9901	Location 17	0.31405227	NP	1.4667249
Field Parameters (pre-/post-sample)													
Temperature (°C)													
Specific Conductance (mS/cm)													
Dissolved Oxygen (mg/L)													
pH													
Oxidation Reduction Potential (mV)													
Turbidity (NTU)													

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION															Location 1	Location 2			Location 2
Sample Type															Surface Water	Surface Water	Inter-Armoring	Sub-Armoring	Sub-Armoring
Sample ID															MBSW0907-01	MBSW0907-02	MBIA0907-02	MBSA0907-02	MBSA0907-62
Sample Date		Inter-Armoring Water Statistics							Sub-Armoring Water Statistics						9/17/2007	9/21/2007	9/21/2007	9/21/2007	9/21/2007
Sample Time															9:30	13:50	14:00	14:10	0:00
CONTAMINANT OF INTEREST		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value				
Total Suspended Solids (mg/L)		22	100%	199	Location 16	49.454545	Gamma	74.828	22	86%	119	Location 26	52.768636	Max	119	10	17	7 J	58	46
Dissolved Metals (mg/L)																			
Arsenic		22	23%	0.00219	Location 13	0.00053	NP	0.00096	22	95%	0.03540	Location 4	0.01357	Normal	0.01735	0.000664 U	0.000664 U	0.000664 U	**0.0142**	**0.0147**
Chromium (III)		22	0%	0.00006	Location 2	0.00006	--	--	22	27%	0.00154	Location 15	0.00022	NP	0.00109	0.000121 U	0.000121 U	0.000121 U	0.000121 U	**0.000195** J
Copper		22	95%	0.00662	Location 26	0.00110	NP	0.00160	22	50%	0.00104	Location 25	0.00023	NP	0.00045	**0.000592** J	0.000855 U	0.00169 U	0.000136 U	0.00014 U
Zinc		22	41%	0.00775	Location 13	0.00294	Gamma	0.00413	22	64%	0.03410	Location 16	0.01099	Gamma	0.01637	0.000469 U	**0.0058**	0.00506 U	**0.016**	**0.0161**
Total Metals (mg/L)																			
Arsenic		22	100%	0.00202	Location 13	0.00105	Normal	0.00123	22	100%	0.03220	Location 4	0.01260	Normal	0.01623	0.000664 U	**0.0012**	**0.00103**	**0.0154**	**0.0155**
Chromium (III)		22	55%	0.00456	Location 16	0.00086	Gamma	0.00136	22	9%	0.00143	Location 3	0.00026	NP	0.00059	0.000121 U	**0.000413** J	**0.000355** J	0.000476 U	0.000533 U
Copper		22	86%	0.00858	Location 16	0.00246	Gamma	0.00328	22	86%	0.00476	Location 15	0.00079	NP	0.00180	**0.000993** J	**0.0013**	**0.00206**	**0.000273** J	**0.000303** J
Zinc		22	64%	0.02220	Location 16	0.00683	Gamma	0.00925	22	91%	0.03350	Location 16	0.01131	Gamma	0.01539	0.000469 U	0.00424 U	0.00468 U	**0.0164**	**0.0158**
Pentachlorophenol (ug/L)		22	0%	ND	N/A	0.1139955	Max	0.119	22	5%	3.27	Location 16	0.2620909	NP	0.8864325	0.237 U	0.237 U	0.237 U	0.237 U	0.237 U
Polyaromatic Hydrocarbons (ug/L)																			
Acenaphthene	L	22	0%	ND	N/A	0.0279682	NP	0.1252719	22	59%	67.6	Location 9	10.814289	Gamma	27.06195	**0.071**	**0.0296**	0.0179 U	**1.48**	**1.56**
Acenaphthylene	L	22	9%	0.0673	Location 17	0.0091	NP	0.0212879	22	0%	0.119	Location 6	0.0261795	NP	0.0950922	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Anthracene	L	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	18%	1.14	Location 9	0.1284091	NP	0.6987505	0.0118 U	0.0118 U	0.0118 U	0.0397 U	0.0366 U
Benzo (a) anthracene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	9%	0.153	Location 7	0.0139773	NP	0.0434328	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (a) pyrene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	0%	0.00595	Location 4	0.0059341	NP	0.0059427	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (b) fluoranthene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	5%	0.0128	Location 7	0.0062477	NP	0.0068367	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (ghi) perylene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	0%	0.00595	Location 4	0.0059341	NP	0.0059427	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (k) fluoranthene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	0%	0.00595	Location 4	0.0059341	NP	0.0059427	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Chrysene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	18%	0.151	Location 7	0.0152068	NP	0.0447838	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Dibenzo (a,h) anthracene	H, C	22	0%	ND	N/A	0.0118864	NP	0.0118945	22	0%	0.0119	Location 4	0.0118841	NP	0.0118927	0.0237 U	0.0237 U	0.0237 U	0.0237 U	0.0237 U
Fluoranthene	H	22	18%	0.0173	#N/A	0.00745	NP	0.0098296	22	36%	12.2	Location 7	0.6481795	NP	6.1322076	0.0118 U	0.0118 U	0.0118 U	0.0273 U	0.0301 U
Fluorene	L	22	0%	ND	N/A	0.014925	NP	0.0373472	22	36%	25.5	Location 9	3.1140159	Max	25.5	**0.0239**	0.0118 U	0.0118 U	0.247 U	0.27 U
Indeno (1,2,3-cd) pyrene	H, C	22	0%	ND	N/A	0.0059364	NP	0.0059445	22	0%	0.00595	Location 4	0.0059341	NP	0.0059427	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Naphthalene	L	22	0%	ND	N/A	0.047425	NP	0.251117	22	18%	407	Location 16	24.132205	NP	325.09434	**0.139**	0.0118 U	0.0118 U	0.0319 U	0.0357 U
Phenanthrene	L	22	0%	ND	N/A	0.0089318	NP	0.0201047	22	14%	14.4	Location 9	1.1117091	NP	8.2170087	0.0118 U	0.0118 U	0.0118 U	0.112 U	0.144 U
Pyrene	H	22	0%	0.0141	#N/A	0.0059864	NP	0.0070073	22	36%	5.53	Location 7	0.3260841	NP	2.81037	0.0118 U	0.0118 U	0.0118 U	0.0222 U	0.0232 U
Total LPAHs		22	9%	0.2481	Location 4	0.0408148	NP	0.0895511	22	59%	445.89	Location 16	38.918006	Gamma	105.28322	**0.2100**	**0.0296**	0.0385 U	**1.48**	**1.56**
Total HPAHs		22	32%	0.032725	Location 3	0.0271193	NP	0.0302989	22	45%	18.0468	Location 7	0.9974023	NP	9.0965488	0.0591 U	0.0591 U	0.0591 U	0.0779 U	0.0798 U
Total CPAHs		22	0%	ND	N/A	0.0267205	NP	0.0267531	22	0.18181818	0.1658	Location 7	0.0345114	NP	0.064582	0.0532 U	0.0532 U	0.0532 U	0.0532 U	0.05315 U
Total PAHs		22	36%	0.142575	Location 12	0.047042	NP	0.0762226	22	0.72727273	445.89	Location 16	39.879699	Gamma	105.23271	**0.2100**	**0.0296**	0.0385 U	**1.48**	**1.56**
Field Parameters (pre-/post-sample)																			
Temperature (°C)																18.95	21.72	23.75 / 23.33	19.91 / 20.47	
Specific Conductance (mS/cm)																0.079	0.087	0.085 / 0.084	0.231 / 0.270	
Dissolved Oxygen (mg/L)																7.06	7.81	7.63 / 7.70	1.01 / 0.60	
pH																7.5	7.28	7.16 / 7.32	6.36 / 6.42	
Oxidation Reduction Potential (mV)																31.2	-9.6	5.1 / 15.5	-47.6 / -47.7	
Turbidity (NTU)																4.85	9.1	2.3 / 0.9	26.8 / 3.6	

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 3			Location 4			Location 5		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-3	MBIA0907-3	MBSA0907-3	MBSW0907-04	MBIA0907-04	MBSA0907-04	MBSW0907-05	MBIA0907-05	MBSA0907-05
Sample Date		9/20/2007	9/20/2007	9/21/2007	9/20/2007	9/20/2007	9/20/2007	9/19/2007	9/19/2007	9/19/2007
Sample Time		14:40	15:10	13:15	11:30	12:55	12:20	11:20	12:00	11:45
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		9 J	23	11	12	22	103	8 J	18	85
Dissolved Metals (mg/L)										
Arsenic		0.00133 U	0.000664 U	0.013	0.000664 U	0.000726 J	0.0354	0.000664 U	0.000664 U	0.0317
Chromium (III)		0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000156 J	0.000121 U	0.000121 U	0.000416 J
Copper		0.000686 J	0.000934 J	0.000775 U	0.000697 J	0.00081 J	0.00031 J	0.000774 J	0.00105 J	0.000358 J
Zinc		0.00261 J	0.00322 U	0.00382 U	0.00168 J	0.00401 J	0.0184	0.000469 U	0.00598	0.0225
Total Metals (mg/L)										
Arsenic		0.000889 J	0.00116	0.0129	0.0012	0.00128	0.0322	0.000677 J	0.000687 J	0.031
Chromium (III)		0.000213 U	0.000588 U	0.00143	0.000547 U	0.000693 J	0.000651 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.00106 J	0.00209	0.00275	0.00144 J	0.00252	0.00166 J	0.00144 J	0.0018 J	0.000396 J
Zinc		0.00374 J	0.00925	0.00958 U	0.0044 J	0.00632	0.029	0.000469 U	0.0063	0.0183
Pentachlorophenol (ug/L)		0.238 U	0.238 U	0.237 U	0.238 U	0.238 U	0.238 U	0.237 U	0.237 U	0.237 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0421	0.0433 U	0.411 U	0.0132 J	0.092 U	0.0925 U	0.321	0.185 U	11
Acenaphthylene	L	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0157 J	0.0141 J	0.0355 U
Anthracene	L	0.0119 U	0.0119 U	0.0142 U	0.0119 U	0.0119 U	0.026 U	0.0118 U	0.0118 U	0.182 U
Benzo (a) anthracene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Benzo (a) pyrene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Benzo (b) fluoranthene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Benzo (ghi) perylene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Benzo (k) fluoranthene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Chrysene	H, C	0.0119 U	0.0119 U	0.0129 J	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Dibenzo (a,h) anthracene	H, C	0.0237 U	0.0238 U	0.0237 U	0.0238 U	0.0238 U	0.0238 U	0.0237 U	0.0237 U	0.0237 U
Fluoranthene	H	0.0119 U	0.0119 U	0.0483 U	0.0119 U	0.0132 J	0.108	0.0118 U	0.0118 U	0.122
Fluorene	L	0.02 J	0.0184 U	0.13 U	0.0119 U	0.0461 U	0.109 U	0.134	0.0743 U	2.38
Indeno (1,2,3-cd) pyrene	H, C	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U
Naphthalene	L	0.229	0.238 U	0.924 U	0.0189 J	0.809 U	0.0324 U	0.688	0.465 U	3.96 U
Phenanthrene	L	0.0119 U	0.0119 U	0.0118 U	0.0119 U	0.0215 U	0.031 U	0.0301	0.0158 U	0.663 U
Pyrene	H	0.0119 U	0.0119 U	0.0437 U	0.0119 U	0.0119 U	0.086	0.0118 U	0.0118 U	0.0843
Total LPAHs		0.2911	0.1677 U	0.7514 U	0.0321	0.4962 U	0.1514 U	1.1888	0.0141	13.38
Total HPAHs		0.0654 U	0.0655 U	0.0129	0.0655 U	0.0132	0.1940	0.0650 U	0.0650 U	0.2063
Total CPAHs		0.0535 U	0.0536 U	0.0129	0.0536 U	0.0536 U	0.0536 U	0.0532 U	0.0532 U	0.05315 U
Total PAHs		0.2911	0.1677 U	0.0129	0.0321	0.0132	0.1940	1.1888	0.0141	13.5863
Field Parameters (pre-/post-sample)										
Temperature (°C)		19.85	19.99 / 19.97	9.54 /	18.29	18.60 / 18.44	19.50 / 19.05	17.67	17.68 / 17.66	18.07 / 18.13
Specific Conductance (mS/cm)		0.074	0.073 / 0.073	0.187 /	0.075	0.087 / 0.073	0.715 / 0.707	0.081	0.090 / 0.078	0.607 / 0.631
Dissolved Oxygen (mg/L)		8.82	8.03 / 7.81	0.88 /	7.61	6.50 / 6.88	0.79 / 0.78	6.56	6.12 / 6.66	0.88 / 0.85
pH		7.65	7.48 / 7.30	6.42 /	7.58	7.24 / 7.03	6.53 / 6.53	7.56	7.18 / 7.01	6.41 / 6.47
Oxidation Reduction Potential (mV)		26	31.8 / 37.2	-7.4 /	20.4	-67.5 / -7.2	-93.9 / -98.3	42.3	-45.6 / 12.9	-68.9 / -73.9
Turbidity (NTU)		3.19	25.5 / 12.3	-12 /	5.44	30.8 / 12.3	11.5 / 2.23	4.06	22.8 / 6.52	3.61 / 1.0

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 6			Location 7			Location 7 (Dup)	Location 8		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-06	MBIA0907-06	MBSA0907-06	MBSW0907-07	MBIA0907-07	MBSA0907-07	MBSW0907-61	MBSW0907-08	MBIA0907-08	MBSA0907-08
Sample Date		9/19/2007	9/20/2007	9/20/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/18/2007	9/18/2007	9/18/2007
Sample Time		13:00	9:00	8:15	10:00	10:40	10:15	0:00	14:15	14:50	14:35
CONTAMINANT OF INTEREST											
Total Suspended Solids (mg/L)		17	193	30	13	19	59	20	15	12	12
Dissolved Metals (mg/L)											
Arsenic		0.000664 U	0.000873 J	0.0216	0.000664 U	0.000664 U	0.00959	0.000664 U	0.000664 U	0.000664 U	0.00156
Chromium (III)		0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.000669 J	0.00066 J	0.00017 J	0.000673 J	0.000894 J	0.000242 J	0.000647 J	0.000641 J	0.00107 J	0.000133 U
Zinc		0.000469 U	0.00248 U	0.0134	0.000469 U	0.000469 U	0.0107	0.000469 U	0.00371 U	0.0059	0.00387 U
Total Metals (mg/L)											
Arsenic		0.000664 U	0.00182	0.0209	0.000664 U	0.000793 J	0.00956	0.000664 U	0.000973 J	0.00114	0.00209
Chromium (III)		0.000257 J	0.00327 U	0.000256 U	0.000121 U	0.000433 J	0.000121 U	0.000217 J	0.000739 J	0.000825 J	0.000406 U
Copper		0.00158 J	0.00634	0.000317 J	0.00144 J	0.0018 J	0.000381 J	0.00147 J	0.00139 J	0.00155 J	0.00072 J
Zinc		0.000469 U	0.0174	0.0111	0.000469 U	0.00636	0.013	0.000469 U	0.00386 J	0.00503	0.00376 J
Pentachlorophenol (ug/L)		0.237 U	0.238 U	0.238 U	0.237 U	0.237 U	0.237 U	0.237 U	0.238 U	0.238 U	0.238 U
Polyaromatic Hydrocarbons (ug/L)											
Acenaphthene	L	0.0118 U	0.0119 U	7.43	0.127	0.0118 U	20	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Acenaphthylene	L	0.0118 U	0.0119 U	0.238 U	0.0118 U	0.0118 U	0.19 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Anthracene	L	0.0118 U	0.0119 U	0.0998 U	0.0118 U	0.0118 U	0.584	0.0118 U	0.0119 U	0.0119 U	0.0186 U
Benzo (a) anthracene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.153	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) pyrene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Benzo (b) fluoranthene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0128 J	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Benzo (ghi) perylene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Benzo (k) fluoranthene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Chrysene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.151	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Dibenzo (a,h) anthracene	H, C	0.0237 U	0.0238 U	0.0238 U	0.0237 U	0.0237 U	0.0237 U	0.0237 U	0.0238 U	0.0238 U	0.0238 U
Fluoranthene	H	0.0118 U	0.0119 U	0.333	0.0118 U	0.0118 U	12.2	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Fluorene	L	0.0118 U	0.0119 U	1.26	0.0177 J	0.0118 U	17.3	0.0118 U	0.0119 U	0.0119 U	0.0669 U
Indeno (1,2,3-cd) pyrene	H, C	0.0118 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Naphthalene	L	0.0154 J	0.0119 U	0.0318 U	1.33	0.0118 U	0.86 U	0.0118 U	0.0119 U	0.0119 U	0.0162 U
Phenanthrene	L	0.0118 U	0.0119 U	0.299 U	0.0118 U	0.0118 U	1.46 U	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Pyrene	H	0.0118 U	0.0119 U	0.198	0.0118 U	0.0118 U	5.53	0.0118 U	0.0119 U	0.0119 U	0.0119 U
Total LPAHs		0.0154	0.0357 U	8.6900	1.4747	0.0354 U	37.8840	0.0354 U	0.0357 U	0.0357 U	0.0687 U
Total HPAHs		0.0650 U	0.0655 U	0.5310	0.0650 U	0.0650 U	18.0468	0.0650 U	0.0655 U	0.0655 U	0.0655 U
Total CPAHs		0.0532 U	0.0536 U	0.0536 U	0.0532 U	0.0532 U	0.1658	0.0532 U	0.0536 U	0.0536 U	0.0536 U
Total PAHs		0.0154	0.1012 U	9.2210	1.4747	0.1004 U	55.9308	0.1004 U	0.1012 U	0.1012 U	0.1342 U
Field Parameters (pre-/post-sample)											
Temperature (°C)		19.48	18.20 / 18.25	18.23 / 18.43	18.7	18.94 / 19.02	18.65 / 18.81		19.37	19.36 / 19.56	19.54 / 19.31
Specific Conductance (mS/cm)		0.082	0.079 / 0.067	18.23 / 18.43	0.078	0.091 / 0.078	0.367 / 0.415		0.078	0.079 / 0.078	0.092 / 0.096
Dissolved Oxygen (mg/L)		6.69	5.95 / 6.11	0.349 / 0.376	6.69	5.82 / 6.34	1.51 / 0.83		6.73	6.64 / 6.49	2.39 / 1.54
pH		7.73	7.35 / 7.13	1.06 / 0.81	7.46	7.28 / 7.19	6.57 / 6.64		7.2	7.13 / 7.01	7.05 / 7.09
Oxidation Reduction Potential (mV)		34.3	-56.4 / -7.3	6.81 / 6.70	23.5	-39.5 / 9.2	-41.4 / -61.0		32.9	38.1 / 47.3	38.4 / 32.4
Turbidity (NTU)		5.3	115 / 71.7	-77.7 / -89.3	4.57	14.4 / 18.9	2.3 / 0.21		4.16	29.5 / 2.75	3.02 / -1.39

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 9			Location 10			Location 11		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-9	MBIA0907-9	MBSA0907-9	MBSW0907-10	MBIA0907-10	MBSA0907-10	MBSW0907-11	MBIA0907-11	MBSA0907-11
Sample Date		9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/18/2007	9/17/2007	9/17/2007	9/17/2007
Sample Time		12:40	13:40	13:10	8:45	9:45	9:15	11:10	11:40	11:20
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		6 J	60	81	7 J	91	3.94 U	8 J	10	3.94 U
Dissolved Metals (mg/L)										
Arsenic		0.000664 U	0.000664 U	0.0201	0.000664 U	0.000664 U	0.00484	0.000664 U	0.000664 U	0.00334
Chromium (III)		0.000121 U	0.000121 U	0.000259 J	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.000905 J	0.000813 J	0.000231 J	0.000734 J	0.00117 J	0.000133 U	0.000412 J	0.000664 J	0.000133 U
Zinc		0.00456 U	0.00468 U	0.0133	0.00408 U	0.00464 U	0.00597	0.00223 J	0.00272 U	0.0143 J
Total Metals (mg/L)										
Arsenic		0.000924 J	0.0012	0.021	0.000881 J	0.00138	0.00596	0.000664 U	0.000664 U	0.00298
Chromium (III)		0.000638 J	0.00167	0.00113 J	0.000825 J	0.00284	0.000705 U	0.000146 J	0.000293 J	0.000121 U
Copper		0.0019 J	0.00323	0.00154 J	0.000962 J	0.00513	0.000201 J	0.00109 J	0.00131 J	0.000315 J
Zinc		0.00329 J	0.00849	0.0125	0.00291 J	0.0132	0.00321 J	0.00334 J	0.00417 U	0.0132
Pentachlorophenol (ug/L)		0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0119 U	0.0119 U	67.6	0.0119 U	0.0674 U	0.409 U	0.0119 U	0.0119 U	16.4
Acenaphthylene	L	0.0119 U	0.0119 U	0.143 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0234 U
Anthracene	L	0.0119 U	0.0119 U	1.14	0.0119 U	0.0119 U	0.0214 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) anthracene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0358	0.0119 U	0.0119 U	0.0119 U
Benzo (a) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (b) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (ghi) perylene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (k) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Chrysene	H, C	0.0119 U	0.0119 U	0.0129 J	0.0119 U	0.0119 U	0.0509	0.0119 U	0.0119 U	0.0119 U
Dibenzo (a,h) anthracene	H, C	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U
Fluoranthene	H	0.0119 U	0.0119 U	0.642	0.0119 U	0.0173 U	0.159	0.0119 U	0.0119 U	0.0119 U
Fluorene	L	0.0119 U	0.0119 U	25.5	0.0119 U	0.0119 U	0.155 U	0.0119 U	0.0119 U	0.0195 U
Indeno (1,2,3-cd) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Naphthalene	L	0.0119 U	0.0119 U	18.5	0.0119 U	0.0119 U	0.0177 U	0.0901	0.107 U	0.244 U
Phenanthrene	L	0.0119 U	0.0119 U	14.4	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Pyrene	H	0.0119 U	0.0119 U	0.309	0.0119 U	0.0141 U	0.61	0.0119 U	0.0119 U	0.0119 U
Total LPAHs		0.0357 U	0.0357 U	127.1400	0.0357 U	0.0635 U	0.3135 U	0.0901	0.0833 U	16.4
Total HPAHs		0.0655 U	0.0655 U	0.9639	0.0655 U	0.0314	0.8048	0.0655 U	0.0655 U	0.06545 U
Total CPAHs		0.0536 U	0.0536 U	0.0129	0.0536 U	0.0536 U	0.0867	0.0536 U	0.0536 U	0.05355 U
Total PAHs		0.1012 U	0.1012 U	128.1039	0.1012 U	0.0314	0.8557	0.0901	0.1487 U	16.4
Field Parameters (pre-/post-sample)										
Temperature (°C)		19.53	19.30 / 19.30	19.54 / 19.39	19.18	19.20 / 18.97	19.17 / 19.35	19.79	20.04 / 20.26	20.17 / 19.99
Specific Conductance (mS/cm)		0.079	0.085 / 0.077	0.524 / 0.439	0.075	0.077 / 0.076	0.111 / 0.122	0.074	0.086 / 0.075	0.329 / 0.397
Dissolved Oxygen (mg/L)		6.86	3.64 / 6.54	1.10 / 0.91	6.48	6.02 / 5.83	1.00 / 0.98	6.76	6.22 / 6.32	1.68 / 1.24
pH		7.33	7.09 / 6.99	6.44 / 6.45	7.5	7.13 / 7.10	6.97 / 6.90	7.25	7.42 / 7.19	6.68 / 6.73
Oxidation Reduction Potential (mV)		25.3	-42.7 / 10.3	-64.8 / -78.0	44.7	-0.1 / 38.8	3.7 / -23.8	42.7	17.3 / 41.2	62.5 / 42.4
Turbidity (NTU)		1.86	31.0 / 18.1	27.1 / 28.5	2.98	127 / 34.4	9.11 / 0.28	3.94	7.4 / 3.71	2.29 / 0.12

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 12				Location 12 (Dup)	Location 13			Location 14		
Sample Type		Surface Water	Surface Water	Inter-Armoring	Sub-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-12	MBSW1007-12	MBIA0907-12	MBSA0907-12	MBSA0907-60	MBSW0907-13	MBIA0907-13	MBSA0907-13	MBSW0907-14	MBIA0907-14	MBSA0907-14
Sample Date		9/17/2007	10/3/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007	9/17/2007
Sample Time		14:40	8:20	15:40	15:00	0:00	13:35	14:10	13:50	9:50	9:55	10:25
CONTAMINANT OF INTEREST												
Total Suspended Solids (mg/L)		16		12	32	29	6 J	13	32	8 J	48	35
Dissolved Metals (mg/L)												
Arsenic		0.000664 U		0.000784 J	0.0305	0.0306	0.000664 U	0.00219	0.00602	0.000664 U	0.000664 U	0.016
Chromium (III)		0.000121 U		0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.000463 J		0.000755 J	0.000133 U	0.000133 U	0.000577 J	0.000488 J	0.000133 U	0.000534 J	0.000496 J	0.000242 J
Zinc		0.00243 J		0.00487 J	0.00391 J	0.00257 J	0.00251 J	0.00775 J	0.0194 J	0.00214 J	0.00304 U	0.0177 J
Total Metals (mg/L)												
Arsenic		0.000664 U		0.000831 J	0.0264	0.0269	0.000664 U	0.00202	0.00536	0.000664 U	0.000742 J	0.0135
Chromium (III)		0.000279 J		0.000321 J	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000295 U	0.000239 J	0.00108	0.000121 U
Copper		0.00223		0.0015 J	0.000258 J	0.000289 J	0.00102 J	0.00113 J	0.000211 J	0.00122 J	0.0026	0.000337 J
Zinc		0.00445 J		0.00553 U	0.00356 J	0.00399 J	0.00393 J	0.00759	0.0149	0.00353 J	0.00749	0.0159 J
Pentachlorophenol (ug/L)			0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U
Polyaromatic Hydrocarbons (ug/L)												
Acenaphthene	L		0.4110	0.287 U	1.6	1.53	0.028	0.0397 U	0.0835 U	0.0119 U	0.0119 U	2.07
Acenaphthylene	L		0.0119 U	0.0119 U	0.0238 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0238 U
Anthracene	L		0.0119 U	0.0119 U	0.0732 U	0.0769 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0415 U
Benzo (a) anthracene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) pyrene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (b) fluoranthene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (ghi) perylene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (k) fluoranthene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Chrysene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Dibenzo (a,h) anthracene	H, C		0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U
Fluoranthene	H		0.0286	0.0119 U	0.0185 U	0.0152 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.015 J	0.0119 U
Fluorene	L		0.1060	0.094 U	0.0301 U	0.0476 U	0.0119 U	0.0119 U	0.0341 U	0.0119 U	0.0119 U	0.797 U
Indeno (1,2,3-cd) pyrene	H, C		0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Naphthalene	L		0.0364	0.0227 U	0.214 U	0.214 U	0.0302	0.0142 U	0.555 U	0.0449	0.0672 U	0.186 U
Phenanthrene	L		0.0510	0.0119 U	0.0576 U	0.0534 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.548 U
Pyrene	H		0.0277	0.0119 U	0.0166 U	0.0141 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Total LPAHs			0.6044	0.2197 U	1.6	1.5834	0.0582	0.0508 U	0.3542 U	0.0449	0.0634 U	2.07
Total HPAHs			0.0563	0.0655 U	0.0166	0.0141	0.0655 U	0.0655 U	0.0655 U	0.0655 U	0.0150	0.06545 U
Total CPAHs			0.0536 U	0.0536 U	0.0536 U	0.05355 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U	0.05355 U
Total PAHs			0.6607	0.2852 U	1.6166	1.5975	0.0582	0.1162 U	0.4196 U	0.0449	0.0150	2.07
Field Parameters (pre-/post-sample)												
Temperature (°C)		20.52	14.49	20.12 / 20.17	19.39 / 19.51		20.57	20.35 / 20.44	18.40 / 18.44	19.92	19.82 / 19.87	19.77 / 19.59
Specific Conductance (mS/cm)		0.08	0.105	0.096 / 0.084	0.327 / 0.405		0.079	0.082 / 0.128	0.199 / 0.192	0.075	0.212 / 0.211	0.077 / 0.067
Dissolved Oxygen (mg/L)		7.41	9.15	6.03 / 6.87	0.88 / 0.78			7.10 / 3.75	0.75 / 0.90	6.81	2.63 / 1.14	6.12 / 6.20
pH		6.93	7.31	6.94 / 6.86	6.14 / 6.21		7.13	6.75 / 6.48	6.17 / 6.25	7.33	6.47 / 6.48	7.24 / 7.15
Oxidation Reduction Potential (mV)		-14.6	156.4	-30.2 / 7.7	-42.2 / -55.2			-27.3 / -15.1	-59.7 / -68.2	46.1	-6.4 / -66	-14.0 / 25.1
Turbidity (NTU)		9.1	2.1	7.89 / 6.07	9.54 / 2.01			6.61 / 3.76	53.3 / 6.48	7.07	4.96 / 0	79.5 / 15.2

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 15			Location 16			Location 17		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-15	MBIA0907-15	MBSA0907-15	MBSW0907-16	MBIA0907-16	MBSA0907-16	MBSW0907-17	MBIA0907-17	MBSA0907-17
Sample Date		9/18/2007	9/18/2007	9/18/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007	9/19/2007
Sample Time		11:05	12:15	11:40	8:05	8:55	8:30	16:35	16:55	16:45
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		9 J	61	98	4 J	199	88	3.94 U	5 J	3.94 U
Dissolved Metals (mg/L)										
Arsenic		0.000664 U	0.000664 U	0.0219	0.000664 U	0.000664 U	0.0195	0.000967 J	0.00146	0.012
Chromium (III)		0.000121 U	0.000121 U	0.00154	0.000121 U	0.000121 U	0.00137	0.000121 U	0.000121 U	0.000121 U
Copper		0.000676 J	0.00078 J	0.000346 J	0.00073 J	0.00113	0.00068 J	0.000773 J	0.000851 J	0.000133 U
Zinc		0.00308 0	0.000469 U	0.0263	0.00534	0.000469 U	0.0341	0.00239 J	0.00317 U	0.00601 U
Total Metals (mg/L)										
Arsenic		0.000988 J	0.00113	0.0216	0.000788 J	0.00164	0.0185	0.00143	0.00184	0.0012
Chromium (III)		0.00081 J	0.00198	0.000221 U	0.00017 J	0.00456	0.000121 U	0.000358 U	0.000121 U	0.000325 U
Copper		0.00113 J	0.00324	0.00476	0.00115 J	0.00858	0.000646 J	0.00105 J	0.00107 J	0.000219 J
Zinc		0.00232 J	0.00902	0.0207	0.000469 U	0.0222	0.0335	0.00279 U	0.0029 U	0.00619 J
Pentachlorophenol (ug/L)		0.238 U	0.238 U	0.238 U	0.237 U	0.237 U	3.27	0.237 U	0.237 U	0.237 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0119 U	0.0119 U	36.7	0.0118 U	0.0118 U	34.4	0.3750	0.3320 U	25.5000
Acenaphthylene	L	0.0119 U	0.0119 U	0.0595 U	0.0118 U	0.0118 U	0.0829 U	0.0581	0.0673	0.1300 U
Anthracene	L	0.0119 U	0.0119 U	0.264	0.0118 U	0.0118 U	0.06 U	0.0118 U	0.0118 U	0.0281 U
Benzo (a) anthracene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (a) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (b) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (ghi) perylene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Benzo (k) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Chrysene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Dibenzo (a,h) anthracene	H, C	0.0238 U	0.0238 U	0.0238 U	0.0237 U	0.0237 U	0.0237 U	0.0237 U	0.0237 U	0.0237 U
Fluoranthene	H	0.0119 U	0.0123 U	0.0605 U	0.0118 U	0.0119 U	0.0118 U	0.0118 U	0.0139 J	0.0295 U
Fluorene	L	0.0119 U	0.0119 U	6.72	0.0118 U	0.0118 U	4.49	0.2540	0.2220 U	4.1500
Indeno (1,2,3-cd) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U
Naphthalene	L	0.0119 U	0.0119 U	85.2	0.0118 U	0.0118 U	407	1.2300	0.1570 U	15.9000
Phenanthrene	L	0.0119 U	0.0119 U	0.953 U	0.0118 U	0.0118 U	0.661 U	0.0730	0.1250 U	0.0388 U
Pyrene	H	0.0119 U	0.0119 U	0.0404 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0118 U	0.0184 J
Total LPAHs		0.0357 U	0.0357 U	128.8840	0.0354 U	0.0354 U	445.8900	1.9901	0.0673	45.5500
Total HPAHs		0.0655 U	0.0123	0.1040 U	0.0650 U	0.0119	0.0650 U	0.0650 U	0.0139	0.0771 U
Total CPAHs		0.0536 U	0.0536 U	0.0536 U	0.0532 U	0.0532 U	0.0532 U	0.0532 U	0.0532 U	0.0532 U
Total PAHs		0.1012 U	0.0123	128.8840	0.1004 U	0.0119	445.8900	1.9901	0.0812	45.5500
Field Parameters (pre-/post-sample)										
Temperature (°C)		19.55	19.29 / 19.30	19.29 / 19.39	18.48	18.38 / 18.50	17.98 / 18.44	19.42	19.55 / 19.46	18.55 / 18.45
Specific Conductance (mS/cm)		0.079	0.091 / 0.076	0.681 / 0.776	0.078	0.101 / 0.078	0.637 / 0.781	0.085	0.090 / 0.090	0.169 / 0.168
Dissolved Oxygen (mg/L)		6.75	4.58 / 6.24	0.83 / 0.79	7.18	6.09 / 5.5	1.07 / 0.81	8.35	6.73 / 7.13	0.82 / 0.73
pH		7.58	7.33 / 7.11	6.32 / 6.39	7.77	7.51 / 7.14	6.41 / 6.45	7.31	7.29 / 7.23	6.82 / 6.81
Oxidation Reduction Potential (mV)		21.8	-57.6 / 3.6	-60.0 / -77.0	18.6	-49.3 / 11.4	-68.7 / -74.8	35.4	36.1 / 38.0	-18.7 / -34.4
Turbidity (NTU)		3.24	89.3 / 25.6	4.09 / 0.87	4.2	95.1 / 79.2	2.3 / 0.64	2.79	2.58 / 2.38	11.1 / 2.59

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 18			Location 19			Location 20		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-18	MBIA0907-18	MBSA0907-18	MBSW1007-19	MBIA1007-19	MBSA1007-19	MBSW0907-20	MBIA0907-20	MBSA0907-20
Sample Date		9/19/2007	9/19/2007	9/19/2007	10/3/2007	10/3/2007	10/3/2007	9/20/2007	9/20/2007	9/20/2007
Sample Time		15:55	16:10	15:40	13:35	13:25	13:45	9:40	10:55	10:15
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		13	6 J	4 J	74	70	103	3.94 U	62	4 J
Dissolved Metals (mg/L)										
Arsenic		0.000756 J	0.000664 U	0.012	0.000664 U	0.000664 U	0.000737 J	0.000664 U	0.000664 U	0.00486
Chromium (III)		0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.000798 J	0.000788 J	0.000133 U	0.000585 J	0.000841 J	0.000155 J	0.000575 J	0.000884 J	0.000133 U
Zinc		0.00226 J	0.00362 J	0.003 U	0.00215 J	0.00247 U	0.00427 U	0.00309 J	0.00338 J	0.00155 U
Total Metals (mg/L)										
Arsenic		0.000995 J	0.000923 J	0.0124	0.000664 U	0.000664 U	0.000863 J	0.00115	0.00141	0.00493
Chromium (III)		0.000461 U	0.000347 U	0.00039 U	0.000276 U	0.000254 U	0.000253 U	0.000371 U	0.00164 U	0.000317 U
Copper		0.00138 J	0.0011 J	0.000335 J	0.000938 U	0.00116 U	0.000698 U	0.000994 J	0.00407	0.000421 J
Zinc		0.00398 J	0.00475 J	0.00462 J	0.00263 J	0.00424 U	0.00387 J	0.00427 J	0.0108	0.00244 U
Pentachlorophenol (ug/L)		0.237 U	0.237 U	0.237 U	0.24 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0186 J	0.0118 U	1.62	0.0120 U	0.0119 U	0.0119 U	0.0605	0.0119 U	11.5
Acenaphthylene	L	0.0118 U	0.0118 U	0.0237 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0595 U
Anthracene	L	0.0118 U	0.0118 U	0.381	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.2 U
Benzo (a) anthracene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) pyrene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (b) fluoranthene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (ghi) perylene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (k) fluoranthene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Chrysene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Dibenzo (a,h) anthracene	H, C	0.0237 U	0.0237 U	0.0237 U	0.0240 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U
Fluoranthene	H	0.0118 U	0.0118 U	0.149	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.012 J	0.389
Fluorene	L	0.0118 U	0.0118 U	1.04 U	0.0120 U	0.0119 U	0.0119 U	0.0211 J	0.0119 U	5.35
Indeno (1,2,3-cd) pyrene	H, C	0.0118 U	0.0118 U	0.0118 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Naphthalene	L	0.0118 U	0.0118 U	0.0131 U	0.0120 U	0.0383 U	0.0188 U	0.483	0.0119 U	1.43 U
Phenanthrene	L	0.0118 U	0.0118 U	7.37	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.314 U
Pyrene	H	0.0118 U	0.0118 U	0.0341 U	0.0120 U	0.0119 U	0.0171 U	0.0119 U	0.0119 U	0.191
Total LPAHs		0.0186	0.0354 U	9.3710	0.0360 U	0.0489 U	0.0392 U	0.5041	0.0357 U	16.8500
Total HPAHs		0.0650 U	0.0650 U	0.1490	0.0660 U	0.0655 U	0.0681 U	0.0655 U	0.0120	0.5800
Total CPAHs		0.0532 U	0.0532 U	0.0532 U	0.0540 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U
Total PAHs		0.0186	0.1004 U	9.5200	0.1020 U	0.1144 U	0.1072 U	0.5041	0.0120	17.4300
Field Parameters (pre-/post-sample)										
Temperature (°C)		19.2	19.57 / 19.59	20.43 / 20.55	18.57	17.80 / 18.25	16.61 / 15.84	18.51	18.79 / 18.81	18.90 / 18.91
Specific Conductance (mS/cm)		0.077	0.079 / 0.080	0.092 / 0.092	0.076	0.072 / 0.074	0.108 / 0.108	0.07	0.071 / 0.071	0.118 / 0.120
Dissolved Oxygen (mg/L)		7.82	7.35 / 7.24	4.40 / 1.51	9.35	9.22 / 8.05	1.41 / 0.61	6.69	6.73 / 6.11	0.65 / 0.81
pH		7.11	7.32 / 7.14	7.23 / 6.93	8.17	8.17 / 8.14	7.39 / 7.18	7.39	7.04 / 7.08	7.08 / 6.80
Oxidation Reduction Potential (mV)		-22.4	7.0 / 23.0	-37.9 / -54.2	29.5	20.5 / 27.5	51.3 / 51.1	25.3	-38.7 / 2.4	-55.9 / -80.2
Turbidity (NTU)		6.72	6.22 / 5.17	22.6 / 5.74	6.81	2.76 / 2.33	8.52 / 5.17	6.51	51.0 / 34.7	20.5 / 10.54

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 21			Location 25			Location 26		
Sample Type		Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring	Surface Water	Inter-Armoring	Sub-Armoring
Sample ID		MBSW0907-21	MBIA0907-21	MBSA0907-21	MBSW1007-25	MBIA1007-25	MBSA1007-25	MBSW1007-26	MBIA1007-26	MBSA1007-26
Sample Date		9/17/2007	9/17/2007	9/17/2007	10/3/2007	10/3/2007	10/3/2007	10/3/2007	10/3/2007	10/3/2007
Sample Time		12:25	13:10	12:40	13:00	12:45	11:15	12:35	12:00	10:55
CONTAMINANT OF INTEREST										
Total Suspended Solids (mg/L)		6 J	6 J	98	86	80	103	74	71	119
Dissolved Metals (mg/L)										
Arsenic		0.000664 U	0.000664 U	0.015	0.000664 U	0.000664 U	0.000664 U	0.000664 U	0.000664 U	0.00367
Chromium (III)		0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U	0.000121 U
Copper		0.000706 J	0.000845 J	0.000137	0.00103 J	0.000786 J	0.00104 J	0.000654 J	0.00662	0.000133 U
Zinc		0.00248 J	0.00386 J	0.0119 J	0.00283 J	0.00321 U	0.00309 U	0.00255 J	0.00725	0.00214 U
Total Metals (mg/L)										
Arsenic		0.000664 U	0.000705 J	0.0136	0.000664 U	0.000664 U	0.000863 J	0.000664 U	0.000664 U	0.00348
Chromium (III)		0.000191 J	0.000193 J	0.000121 U	0.000531 U	0.000347 U	0.00092 U	0.000381 U	0.000314 U	0.000276 U
Copper		0.00116 J	0.00132 J	0.000183 J	0.00146 U	0.00119 U	0.0017 U	0.00108 U	0.000936 U	0.000263 U
Zinc		0.00365 J	0.00472 U	0.00766 J	0.00382 J	0.00311 U	0.00892	0.00318 U	0.0024 U	0.00209 J
Pentachlorophenol (ug/L)		0.238 U	0.238 U	0.238 U	0.24 U	0.238 U	0.238 U	0.238 U	0.238 U	0.238 U
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L	0.0119 U	0.0119 U	0.0251 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Acenaphthylene	L	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Anthracene	L	0.0119 U	0.0119 U	0.0443 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) anthracene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (a) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (b) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (ghi) perylene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Benzo (k) fluoranthene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Chrysene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Dibenzo (a,h) anthracene	H, C	0.0238 U	0.0238 U	0.0238 U	0.0240 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U	0.0238 U
Fluoranthene	H	0.0119 U	0.0119 U	0.0119 U	0.0199 J	0.0119 U	0.0305 U	0.0231 J	0.0119 U	0.0153 U
Fluorene	L	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Indeno (1,2,3-cd) pyrene	H, C	0.0119 U	0.0119 U	0.0119 U	0.0120 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U	0.0119 U
Naphthalene	L	0.0119 U	0.0119 U	0.0168 U	0.0120 U	0.0182 U	0.0377 U	0.0119 U	0.0196 U	0.0238 U
Phenanthrene	L	0.0119 U	0.0119 U	0.0119 U	0.0314	0.0119 U	0.0508 U	0.0391	0.0169 U	0.0226 U
Pyrene	H	0.0119 U	0.0119 U	0.0119 U	0.0181 J	0.0119 U	0.0287 U	0.0251	0.0119 U	0.0192 U
Total LPAHs		0.0357 U	0.0357 U	0.0610 U	0.0314	0.0389 U	0.0681 U	0.0391	0.0421 U	0.0470 U
Total HPAHs		0.0655 U	0.0655 U	0.0655 U	0.0380	0.0655 U	0.0832 U	0.0482	0.0655 U	0.0708 U
Total CPAHs		0.0536 U	0.0536 U	0.0536 U	0.0540 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U	0.0536 U
Total PAHs		0.1012 U	0.1012 U	0.1264 U	0.0694	0.1043 U	0.1512 U	0.0873	0.1075 U	0.1178 U
Field Parameters (pre-/post-sample)										
Temperature (°C)		20.32	20.22 / 20.24	17.47 / 17.22	15.45	15.35 / 15.38	17.12 / 17.41	15.77	15.78 / 15.70	14.99 / 14.98
Specific Conductance (mS/cm)		0.079	0.078 / 0.079	0.319 / 0.328	0.04	0.068 / 0.068	0.097 / 0.096	0.069	0.071 / 0.070	0.111 / 0.111
Dissolved Oxygen (mg/L)		7.64	6.95 / 6.99	0.71 / 0.68	9.53	9.44 / 9.81	7.90 / 7.64	9.62	9.47 / 9.45	0.39 / 0.39
pH		7.43	6.91 / 6.90	6.42 / 6.42	7.78	7.67 / 7.63	7.09 / 7.00	7.6	7.54 / 7.62	7.16 / 7.2
Oxidation Reduction Potential (mV)		46	-28.8 / 3.3	-105.3 / -119.5	43.5	38.0 / 47.2	16.9 / 35.7	41.1	15.5 / 34.8	-90 / 101.9
Turbidity (NTU)		3.29	3.52 / 3.69	3.06 / 0.81	4.59	8.09 / 5.47	23.9 / 16.3	3.92	5.93 / 3.60	7.68 / 9.17

Table 3-1g
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Data
Fall 2007

SAMPLE LOCATION		Location 26 (Dup)		Location 27		Rinsate Blanks			
Sample Type		Inter Armoring		Surface Water		Inter-Armoring		Sub-Armoring	
Sample ID		MBIA0907-64		MBSW0907-27		MBIA1007-RS		MBSA1007-RS	
Sample Date		10/3/2007		9/17/2007		10/3/2007		10/3/2007	
Sample Time		0:00		9:30		15:10		15:00	
CONTAMINANT OF INTEREST									
Total Suspended Solids (mg/L)		71		9	J	na		na	
Dissolved Metals (mg/L)									
Arsenic		0.000664	U	0.000664	U	0.000664	U	0.000664	U
Chromium (III)		0.000121	U	0.000121	U	0.000121	U	0.000121	U
Copper		**0.000631**	J	**0.000349**	J	0.000133	U	0.000133	U
Zinc		0.0024	U	**0.00318**	J	**0.000654**	J	**0.00122**	J
Total Metals (mg/L)									
Arsenic		0.000664	U	0.000664	U	0.000664	U	0.000664	U
Chromium (III)		0.000345	U	**0.000258**	J	0.000121	U	**0.000146**	J
Copper		0.00102	U	**0.00113**	J	0.000133	U	0.000133	U
Zinc		0.00277	U	**0.0035**	J	**0.00124**	J	**0.000556**	J
Pentachlorophenol (ug/L)		0.0238	U	0.238	U	0.239	U	0.238	U
Polyaromatic Hydrocarbons (ug/L)									
Acenaphthene	L	0.0119	U	0.0119	U	**0.143**		**0.212**	
Acenaphthylene	L	0.0119	U	0.0119	U	0.012	U	**0.0433**	
Anthracene	L	0.0119	U	0.0119	U	0.012	U	**0.048**	
Benzo (a) anthracene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (a) pyrene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (b) fluoranthene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (ghi) perylene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (k) fluoranthene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Chrysene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Dibenzo (a,h) anthracene	H, C	0.0238	U	0.0238	U	0.0239	U	0.0238	U
Fluoranthene	H	0.0119	U	0.0119	U	0.012	U	**0.0214**	J
Fluorene	L	0.0119	U	0.0119	U	**0.12**		**0.325**	
Indeno (1,2,3-cd) pyrene	H, C	0.0119	U	0.0119	U	0.012	U	0.0119	U
Naphthalene	L	0.0161	U	**0.0361**		**1.53**		**2.24**	
Phenanthrene	L	0.0169	U	0.0119	U	**0.115**		**0.337**	
Pyrene	H	0.0119	U	0.0119	U	0.012	U	**0.0155**	J
Total LPAHs		0.0403	U	**0.0361**		**1.9080**		**3.2053**	
Total HPAHs		0.0655	U	0.0655	U	0.0660	U	**0.0369**	
Total CPAHs		0.0536	U	0.0536	U	0.0540	U	0.0536	U
Total PAHs		0.1058	U	**0.0361**		**1.9080**		**3.2422**	
Field Parameters (pre-/post-sample)									
Temperature (°C)				19.74					
Specific Conductance (mS/cm)				0.079					
Dissolved Oxygen (mg/L)				7.23					
pH				7.74					
Oxidation Reduction Potential (mV)				21.8					
Turbidity (NTU)				4.18					

Table 3-1g
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Notes and Key
Fall 2007

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

ADDITIONAL NOTES:

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

Summary results for a number of inter-armoring and sub-armoring samples from the Fall 2007 sampling event (shown in table 3-1g) were revised during data review as a result of the detection of non-carcinogenic PAHs in field rinsate samples. Original laboratory data reports are provided as an appendix to this report. Samples include inter-armoring samples IA-0907-2, 3, 4, 5, 10, 11, 12, 13, 14, 15, 16, 17, 19, 25, 26 and 64 (duplicate from location 26) and subarmoring samples SA-0907-2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 25, 26, 60 (duplicate from location 12), and 62 (duplicate from location 2). Detections reported by the laboratory at less than 5 times the rinsate blank concentration were changed to 'U' values in accordance with data review guidelines. Such values were all well below the reference criteria for those PAHs, where such criteria exist.

KEY:

AWQC	Ambient Water Quality Criteria
C	Carcinogenic PAH (CPAH)
CCC	Criterion Continuous Concentration
H	High Molecular Weight PAH (HPAH)
J	Estimated Value
L	Low Molecular Weight PAH (LPAH)
MCL	Drinking Water Maximum Contaminant Levels
MDL	Method Detection Limit
mg/L	milligrams per liter
PAH	Polyaromatic Hydrocarbons
ROD	Record of Decision
U	Value Below MDL (value represents MDL)
ug/L	micrograms per liter
Gamma	Gamma Distribution
NP	Non-parametric Distribution
Max	Maximum Concentration

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-1h
McCormick and Baxter Creosoting Company
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Sampling Quality Assurance Samples
Fall 2007

SAMPLE LOCATION		Sediment Cap Performance Goals		Comparison Criteria			DI Water Samples						Field Rinsate Blanks			
Sample Type		McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Laboratory Supplied DI Water		Ultra Pure DI Water Sampled through Stored Tubing		Ultra Pure DI Water		Inter-Armoring		Sub-Armoring	
Sample ID							MBDI-1207		MB-TB-0108		MB-RS-0108		MBIA1007-RS		MBSA1007-RS	
Sample Date							12/17/2007		1/17/2008		1/17/2008		10/3/2007		10/3/2007	
Sample Time							13:30		13:00		13:30		15:10		15:00	
CONTAMINANT OF INTEREST		Aquatic Life (chronic)[1]	Human Health (fish consumption only)[1]	Aquatic Life (chronic)[2]	Human Health (consumption of organism only)[2]	Maximum Contaminant Levels (MCLs)[3]										
Total Suspended Solids (mg/L)							na		na		na		na		na	
Dissolved Metals (mg/L)																
Arsenic							na		0.000664	U	na		0.000664	U	0.000664	U
Chromium (III)							na		0.000121	U	na		0.000121	U	0.000121	U
Copper							na		0.000133	U	na		0.000133	U	0.000133	U
Zinc							na		0.000470	J	na		0.000654	J	0.00122	J
Total Metals (mg/L)																
Arsenic		0.19		0.15	0.00014	0.01	0.001	4	0.000664	U	0.000664	U	0.000664	U	0.000664	U
Chromium (III)		0.21		0.074		0.1	0.001	4	0.000260	J	0.000250	J	0.000121	U	0.000146	J
Copper		0.012		0.009			0.001	4	0.00139	J	0.000133	U	0.000133	U	0.000133	U
Zinc		0.11		0.12	26		na		0.00102	J	0.000630	J	0.00124	J	0.000556	J
Pentachlorophenol (ug/L)		13		11	3	1	na		0.238	U	0.238	U	0.239	U	0.238	U
Polyaromatic Hydrocarbons (ug/L)																
Acenaphthene	L	520			990		0.281		0.0142	J	0.0119	U	0.143		0.212	
Acenaphthylene	L						0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0433	
Anthracene	L				40,000		0.101	4	0.0119	U	0.0119	U	0.012	U	0.048	
Benzo (a) anthracene	H, C				0.018		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (a) pyrene	H, C				0.018	0.2	0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (b) fluoranthene	H, C				0.018		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (ghi) perylene	H, C						0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Benzo (k) fluoranthene	H, C				0.018		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Chrysene	H, C				0.018		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Dibenzo (a,h) anthracene	H, C				0.018		0.190	4	0.0238	U	0.0238	U	0.0239	U	0.0238	U
Fluoranthene	H		54		140		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0214	J
Fluorene	L				5300		0.421		0.0119	U	0.0119	U	0.12		0.325	
Indeno (1,2,3-cd) pyrene	H, C				0.018		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0119	U
Naphthalene	L	620					2.14		0.0517		0.0119	U	1.53		2.24	
Phenanthrene	L						0.528		0.0119	U	0.0119	U	0.115		0.337	
Pyrene	H				4,000		0.0952	4	0.0119	U	0.0119	U	0.012	U	0.0155	J
Total LPAHs							1.7355		0.0330		0.0357	U	1.9080		3.2053	
Total HPAHs							0.5234	4	0.0655		0.0655	U	0.0660	U	0.0369	
Total CPAHs			0.031				0.4282	4	0.0536		0.0536	U	0.0540	U	0.0536	U
Total PAHs							1.7355		0.0330		0.1547	U	1.9080		3.2422	

Table 3-1h
McCormick and Baxter Creosoting Company
Portland, Oregon
Surface Water, Inter-Armoring Water, and Sub-Armoring Water Summary Notes and Key
Fall 2007

NOTES:

The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

[4] Value represents MRL.

KEY:

AWQC	Ambient Water Quality Criteria
C	Carcinogenic PAH (CPAH)
CCC	Criterion Continuous Concentration
H	High Molecular Weight PAH (HPAH)
J	Estimated Value
L	Low Molecular Weight PAH (LPAH)
MCL	Drinking Water Maximum Contaminant Levels
MDL	Method Detection Limit
mg/L	milligrams per liter
PAH	Polyaromatic Hydrocarbons
ROD	Record of Decision
U	Value Below MDL (value represents MDL)
ug/L	micrograms per liter
Gamma	Gamma Distribution
NP	Non-parametric Distribution
Max	Maximum Concentration

Bold Indicates Analyte was detected, but does not exceed the most stringent criteria.

shaded Indicates a value less than the MDL where the MDL exceeds the stringent sediment cap performance goal or comparison criteria. Only used on the Spring and Fall 2007 data tables.

Inverse Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals or comparison criteria.

Table 3-2[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Surface Water Data

Sample		McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Surface Water Fall 2002						
Contaminant of Interest		Aquatic Life (chronic)[2]	Human Health (fish consumption only)[2]	Aquatic Life (chronic)[3]	Human Health (consumption of organism only)[3]	Maximum Contaminant Levels (MCLs)[4]	**Number of Samples**	**Detection Frequency**	**Max Detection**	**Max Location**	**Mean Conc.**	**Data Distribution**	**95% UCL Value**
Total Suspended Solids (mg/L)							--	--	--	--	--	--	--
Dissolved Organic Carbon (mg/L)							--	--	--	--	--	--	--
Dissolved Metals (mg/L)													
Arsenic							--	--	--	--	--	--	--
Chromium							--	--	--	--	--	--	--
Copper							--	--	--	--	--	--	--
Zinc							--	--	--	--	--	--	--
Total Metals (mg/L)													
Arsenic		0.19		0.15	0.00014	0.01	15	27%	0.0011	SED-6	0.000330533	NP	0.000530515
Chromium		0.21		0.074		0.1	15	33%	0.0021	SED-8	0.000573734	NP	0.000978706
Copper		0.012		0.009			15	100%	0.0209	SED-7	0.004620027	Gamma	0.01582394
Zinc		0.11		0.12	26		15	100%	0.0181	SED-9	0.004865659	NP	0.008263584
Pentachlorophenol (ug/L)		13		15	3	1	15	40%	0.079	SED-3	0.0684	NP	0.123299
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)													
Acenaphthene	L	520			990		15	13%	9.8	SED-6	0.66344	NP	7.156843
Acenaphthylene	L						15	7%	0.042	SED-6	0.012673333	NP	0.016747
Anthracene	L				40,000		15	7%	3.8	SED-6	0.263206667	NP	2.776827
Benzo[a]anthracene	H, C				0.018		15	27%	1.5	SED-6	0.11402	NP	1.099229
Benzo[b]fluoranthene	H, C				0.018	0.2	15	7%	0.77	SED-6	0.061206667	NP	0.56496
Benzo[k]fluoranthene	H				0.018		15	7%	0.39	SED-6	0.035873333	NP	0.14614
Benzo[a]pyrene	H, C						15	7%	0.44	SED-6	0.044073333	NP	0.167401
Benzo[g,h,i]perylene	H, C				0.018		15	7%	0.087	SED-6	0.015673333	NP	0.037927
Chrysene	H, C				0.018		15	27%	1.2	SED-6	0.094113333	NP	0.880299
Dibenzo[a,h]anthracene	H, C				0.018		15	20%	0.093	SED-6	0.02815	NP	0.037425
Fluoranthene	H		54		140		15	60%	11.9	SED-6	0.80679	NP	8.690823
Fluorene	L				5300		6	0%	ND	N/A	0.012016667	NP	0.012299
Ideno[1,2,3-cd]pyrene	H, C				0.018		15	7%	0.13	SED-6	0.023406667	NP	0.056801
Naphthalene	L	620					15	7%	3.3	SED-6	0.229873333	NP	2.411831
Phenanthrene	L						15	33%	22.7	SED-6	1.52394	NP	16.57388
Pyrene	H				4,000		15	33%	5.3	SED-6	0.364506667	NP	3.872194
Total LPAHs							15	33%	39.6	SED-6	2.663636667	NP	28.91452
Total HPAHs							15	60%	21.8	SED-6 (ug/L)	1.48207	NP	15.922212
Total Carcinogenic PAHs			0.031				15	20%	4.22	SED-6 (ug/L)	0.327048333	NP	3.0934333
Total PAHs							15	53%	61.5	SED-6	4.163085	NP	44.911386

Table 3-2[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Surface Water Data

Sample		Surface Water Fall 2002 - Without Sample SED-6							Surface Water Fall 2003							Surface Water Fall 2005						
Contaminant of Interest		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids (mg/L)		--	--	--	--	--	--	--	21	100%	180	MBSWGB0326	22	NP	112.5361	26	92%	17	MBSWGB05-2A	5.929615385	Gamma	7.300828
Dissolved Organic Carbon (mg/L)		--	--	--	--	--	--	--	21	100%	3.33	MBSWGB0312	2.21952381	Gamma	2.346213	26	88%	10.9	MBSWGB05-12	2.776730769	NP	5.360104
Dissolved Metals (mg/L)																						
Arsenic		--	--	--	--	--	--	--	--	--	--	--	--	--	--	26	46%	0.000978	MBSWGB05-18	0.000417269	NP	0.000637
Chromium		--	--	--	--	--	--	--	--	--	--	--	--	--	--	26	0%	ND	NA	0.00036	NA	NA
Copper		--	--	--	--	--	--	--	--	--	--	--	--	--	--	26	81%	0.0112	MBSWGB05-13	0.001407923	NP	0.003149
Zinc		--	--	--	--	--	--	--	--	--	--	--	--	--	--	26	85%	0.00979	MBSWGB05-13	0.003641923	Gamma	0.004593
Total Metals (mg/L)																						
Arsenic		14	21%	0.94	SED-8 (ug/L)	0.275571429	NP	0.439541	21	81%	0.00206	MBSWGB0326	0.000952571	Normal	0.001191804	26	100%	0.00142	MBSWGB05-04	0.000758885	Gamma	0.000831
Chromium		14	36%	2.1	SED-8 (ug/L)	0.568286429	NP	0.970079	21	100%	0.00547	MBSWGB0326	0.00241	NP	0.002714633	26	0%	ND	NA	0.000381	NP	0.00042
Copper		14	100%	20.9	SED-7 (ug/L)	4.7286	Gamma	18.12549	21	100%	0.0211	MBSWGB0315	0.003484762	NP	0.007920017	26	81%	0.00283	MBSWGB05-	0.000991577	NP	0.00116
Zinc		14	100%	18.1	SED-9 (ug/L)	4.585348571	NP	9.557181	21	100%	0.0199	MBSWGB0326	0.007241429	NP	0.008767455	26	88%	0.00843	MBSWGB05-	0.00314	NP	0.004608
Pentachlorophenol (ug/L)		14	36%	0.079	SED-3 (ug/L)	0.067714286	Max	0.079	21	0%	ND	N/A	0.034009524	NP	0.078359	26	0%	ND	NA	0.174461538	NP	0.286557
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																						
Acenaphthene	L	14	7%	0.013	SED-8 (ug/L)	0.010828571	NP	0.011507	21	0%	ND	N/A	0.005959524	NP	0.005973	26	19%	0.0972	MBSWGB05-	0.016830769	NP	0.035615
Acenaphthylene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	21	0%	ND	N/A	0.005959524	NP	0.005973	26	0%	ND	NA	0.008728846	NP	0.014331
Anthracene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	21	0%	ND	N/A	0.005959524	NP	0.005973	26	0%	ND	NA	0.008728846	NP	0.014331
Benzo[a]anthracene	H, C	14	21%	0.036	SED-1 (ug/L)	0.015021429	Gamma	0.019516	21	0%	ND	N/A	0.002383333	Normal	0.002388	26	0%	ND	NA	0.008728846	NP	0.014331
Benzo[b]fluoranthene	H, C	14	0%	ND	N/A	0.010578571	NP	0.01121	21	5%	0.00806	MBSWGB0309	0.002654048	NP	0.003165	26	0%	ND	NA	0.008728846	NP	0.014331
Benzo[k]fluoranthene	H	14	0%	ND	N/A	0.010578571	NP	0.01121	21	5%	0.00806	MBSWGB0309	0.002654048	NP	0.003165	26	0%	ND	NA	0.008728846	NP	0.014331
Benzo[a]pyrene	H, C	14	0%	ND	N/A	0.015792857	NP	0.017409	21	5%	0.00239	MBSWGB0301	0.00124881	NP	0.001357	26	0%	ND	NA	0.008728846	NP	0.014331
Benzo[g,h,i]peryiene	H, C	14	0%	ND	N/A	0.010578571	NP	0.01121	21	0%	ND	N/A	0.005959524	NP	0.005973	26	0%	ND	NA	0.008728846	NP	0.014331
Chrysene	H, C	14	21%	0.036	SED-1 (ug/L)	0.015121429	Gamma	0.019451	21	5%	0.0121	MBSWGB0309	0.002846429	NP	0.003722	26	0%	ND	NA	0.008728846	NP	0.014331
Dibenzo[a,h]anthracene	H, C	14	14%	0.037	SED-2 (ug/L)	0.023517857	Gamma	0.026479	21	0%	ND	N/A	0.002719048	NP	0.006366	26	0%	ND	NA	0.017446154	NP	0.028656
Fluoranthene	H	14	57%	0.032	SED-3 (ug/L)	0.014417857	Gamma	0.019225	21	19%	0.0783	MBSWGB0309	0.00727119	NP	0.04377	26	0%	ND	NA	0.008728846	NP	0.014331
Fluorene	L	6	0%	ND	N/A	0.012016667	NP	0.012299	21	5%	0.0125	MBSWGB0309	0.006271429	NP	0.006861	26	8%	0.0234	MBSWGB05-	0.009782692	NP	0.015943
Ideno[1,2,3-cd]pyrene	H, C	14	0%	ND	N/A	0.015792857	NP	0.017397	21	0%	ND	N/A	0.00272119	NP	0.006374	26	0%	ND	NA	0.008728846	NP	0.014331
Naphthalene	L	14	0%	ND	N/A	0.010578571	NP	0.01121	21	0%	ND	N/A	0.007328333	Max	0.024	26	15%	0.911	MBSWGB05-	0.066251923	NP	0.044415
Phenanthrene	L	14	29%	0.018	SED-1 (ug/L)	0.011364286	Gamma	0.01253	21	5%	0.116	MBSWGB0309	0.0112	NP	0.034041	26	4%	0.0129	MBSWGB05-	0.008992308	Max	0.0129
Pyrene	H	14	29%	0.018	SED-1 (ug/L)	0.011971429	Gamma	0.013209	21	33%	2.58	MBSWGB0324	0.12686	NP	1.347524	26	0%	ND	NA	0.008728846	NP	0.014331
Total LPAHs		14	29%	0.013	SED-3 AND	0.025325	Max	0.013	21	5%	0.116	MBSWGB0309	0.02309631	NP	0.031932	26	19%	1.0445	MBSWGB05-	0.093119231	NP	0.5195638
Total HPAHs		14	57%	0.074	SED-9 (ug/L)	0.030789286	Normal	0.0400213	21	43%	0.16625	MBSWGB0309	0.018252857	NP	0.093187	26	4%	0.0132	MBSWGB05-	0.045955769	Max	0.0132
Total Carcinogenic PAHs		14	14%	0.045	SED-9 (ug/L)	0.048980357	Normal	0.0545531	21	5%	0.10085	MBSWGB0309	0.014277024	NP	0.033288	26	0%	ND	NA	0.041359615	NP	0.0665958
Total PAHs		14	57%	0.0827	SED-9 (ug/L)	0.062146429	Max	0.0827	21	43%	0.28225	MBSWGB0309	0.032461905	NP	0.159941	26	19%	1.10505	MBSWGB05-17	0.143707692	NP	0.323034

Table 3-2[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Surface Water Data

Sample		Surface Water Spring 2006							Surface Water Fall 2006						
Contaminant of Interest		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids (mg/L)		--	--	--	--	--	--	--	22	95%	20	Location 19	5.690454545	Lognormal	7.270927
Dissolved Organic Carbon (mg/L)		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Metals (mg/L)															
Arsenic		--	--	--	--	--	--	--	21	95%	0.00061	Location 18	0.0004	NP	0.000522
Chromium		--	--	--	--	--	--	--	21	52%	0.00013	Location 11	7.95238E-05	NP	0.0000928
Copper		--	--	--	--	--	--	--	21	100%	0.00132	Location 25	0.000735714	NP	0.000798
Zinc		--	--	--	--	--	--	--	21	71%	0.00487	Location 11	0.002839048	NP	0.00675
Total Metals (mg/L)															
Arsenic		23	22%	0.00233	Location 25	0.000587739	NP	0.001063	22	95%	0.00071	Location 25	0.000486455	Gamma	0.000523
Chromium		23	74%	0.00455	Location 14	0.00097913	NP	0.003626	22	64%	0.00234	Location 3	0.000270705	NP	0.000708
Copper		23	74%	0.0168	Location 18	0.00402587	Max	0.0168	22	100%	0.00344	Location 3	0.001143182	NP	0.001378
Zinc		23	87%	0.04	Location 25	0.00818413	NP	0.029105	22	27%	0.00482	Location 7	0.001551568	NP	0.002761
Pentachlorophenol (ug/L)		23	0%	ND	NA	0.11973913	NP	0.120275	22	0%	ND	NA	0.123909091	Normal	0.124905
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)															
Acenaphthene	L	23	0%	ND	NA	0.00598913	NP	0.006018	22	23%	0.166	Location 25	0.018997727	NP	0.053399
Acenaphthylene	L	23	0%	ND	NA	0.00598913	NP	0.006017	22	5%	0.0126	Location 4	0.006477273	NP	0.007031
Anthracene	L	23	0%	ND	NA	0.00598913	NP	0.006018	22	5%	0.0126	Location 4	0.006477273	NP	0.007031
Benzo[a]anthracene	H, C	23	0%	ND	NA	0.00598913	NP	0.006018	22	5%	0.0126	Location 4	0.006477273	NP	0.007031
Benzo[b]fluoranthene	H, C	23	4%	0.0124	Location 13	0.006271739	NP	0.006797	22	5%	0.0126	Location 4	0.006477273	NP	0.007031
Benzo[k]fluoranthene	H	23	4%	0.0119	Location 13	0.00625	NP	0.006734	22	0%	ND	NA	0.006188636	Normal	0.006239
Benzo[a]pyrene	H, C	23	4%	0.0146	Location 13	0.006367391	NP	0.007072	22	0%	ND	NA	0.006188636	Normal	0.006239
Benzo[g,h,i]perylene	H, C	23	0%	0.0062	Location 12	0.00598913	NP	0.006018	22	0%	ND	NA	0.006188636	Normal	0.006239
Chrysene	H, C	23	9%	0.0195	Location 25	0.006934783	NP	0.008168	22	5%	0.0126	Location 4	0.006477273	NP	0.007031
Dibenzo[a,h]anthracene	H, C	23	0%	ND	NA	0.011973913	NP	0.012028	22	0%	ND	NA	0.012390909	Normal	0.012492
Fluoranthene	H	23	9%	0.0396	Location 25	0.008526087	NP	0.016247	22	5%	0.0143	Location 14	0.006552273	NP	0.007252
Fluorene	L	23	0%	ND	NA	0.00598913	NP	0.006018	22	9%	0.062	Location 25	0.009759091	NP	0.021476
Ideno[1,2,3-cd]pyrene	H, C	23	0%	ND	NA	0.00598913	NP	0.006018	22	0%	ND	NA	0.006188636	Normal	0.006235
Naphthalene	L	23	26%	0.19	Location 25	0.017343478	NP	0.052277	22	18%	0.93	Location 25	0.087315909	NP	0.617948
Phenanthrene	L	23	4%	0.0159	Location 13	0.006423913	NP	0.007236	22	9%	0.0295	Location 25	0.007547727	NP	0.009581
Pyrene	H	23	13%	0.0319	Location 25	0.008152174	NP	0.01044	22	9%	0.0128	Location 14	0.006772727	NP	0.007524
Total LPAHs		23	26%	0.19	Location 25	0.026895652	NP	0.059955	22	18%	1.1875	Location 25	0.116028409	NP	0.760173
Total HPAHs		23	13%	0.1066	Location 13	0.040419565	NP	0.047293	22	0%	ND	NA	0.034048864	Normal	0.034329
Total Carcinogenic PAHs		23	9%	0.053	Location 13	0.027782609	NP	0.029832	22	0%	ND	NA	0.027859091	Normal	0.028088
Total PAHs		23	30%	0.281	Location 25	0.05818587	NP	0.109319	22	23%	1.1875	Location 25	0.122415909	NP	0.762092

Table 3-2[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Surface Water Data

Sample		Surface Water Spring 2007							Surface Water Fall 2007						
Contaminant of Interest		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Suspended Solids (mg/L)		23	100%	12	Location 6	7.260869565	Normal	8.4	22	91%	86	Location 25	19.04272727	Log	36.449153
Dissolved Organic Carbon (mg/L)		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Metals (mg/L)															
Arsenic		23	83%	0.00004	Location 10	0.00004	NP	0.00026	22	9%	0.000967	Location 17	0.000395273	NP	0.000461
Chromium		23	100%	0.00039	Location 10	0.00039	Normal	0.00038	22	0%	ND	N/A	0.0000605	--	--
Copper		23	100%	0.00053	Location 10	0.00053	NP	0.000735	22	95%	0.00103	Location 25	0.000669068	Normal	0.007225
Zinc		23	83%	0.00158	Location 10	0.000336	NP	0.012	22	73%	0.0058	Location 2	0.002384023	NP	0.003611
Total Metals (mg/L)															
Arsenic		23	100%	0.00041	Location 6	0.000271739	Normal	0.0002899	22	100%	0.00143	Location 17	0.000700682	NP	0.0010496
Chromium		23	52%	0.00165	Location 26	0.000421957	NP	0.0015	22	55%	0.000825	Location 10	0.000300636	Log	0.0004299
Copper		23	100%	0.00315	Location 19	0.001413913	NP	0.0015718	22	86%	0.00223	Location 12	0.001213864	Normal	0.0013603
Zinc		23	35%	0.0216	Location 20	0.002779565	NP	0.0068478	22	68%	0.00445	Location 12	0.002734682	Max	0.00445
Pentachlorophenol (ug/L)		23	0%	ND	N/A	0.122934783	NP	0.1233801	22	0%	ND	N/A	0.118931818	NP	0.119089
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)															
Acenaphthene	L	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	45%	0.411	Location 12	0.068063636	NP	0.3359264
Acenaphthylene	L	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	9%	0.0581	Location 17	0.008756818	NP	0.0191793
Anthracene	L	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Benzo[a]anthracene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Benzo[b]fluoranthene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Benzo[k]fluoranthene	H	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Benzo[a]pyrene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Benzo[g,h,i]perylene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Chrysene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Dibenzo[a,h]anthracene	H, C	23	0%	ND	N/A	0.012293478	NP	0.012338	22	0%	ND	N/A	0.011890909	NP	0.011907
Fluoranthene	H	23	4%	0.0133	Location 19	0.006454348	NP	0.0070409	22	14%	0.0286	Location 12	0.008379545	NP	0.0108649
Fluorene	L	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	27%	0.254	Location 17	0.02945	NP	0.1573599
Ideno[1,2,3-cd]pyrene	H, C	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	0%	ND	N/A	0.005938636	NP	0.0059499
Naphthalene	L	23	0%	ND	N/A	0.006404348	NP	0.0069053	22	50%	1.33	Location 7	0.193695455	NP	1.0254965
Phenanthrene	L	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	23%	0.073	Location 17	0.014797727	NP	0.031925
Pyrene	H	23	0%	ND	N/A	0.00613913	NP	0.0061619	22	14%	0.0277	Location 12	0.008347727	NP	0.0108188
Total LPAHs		23	0%	ND	N/A	0.01855	NP	0.0188105	22	68%	1.9901	Location 17	0.297161364	NP	1.4618828
Total HPAHs		23	4%	0.034375	Location 3	0.032902174	Max	0.034375	22	14%	0.0563	Location 12	0.0345375	NP	0.0368851
Total Carcinogenic PAHs		23	0%	ND	N/A	0.027632609	NP	0.0277333	22	0%	ND	N/A	0.026730682	NP	0.0267776
Total PAHs		23	4%	0.0553	Location 7	0.050663043	NP	0.0533144	22	68%	1.9901	Location 17	0.314052273	NP	1.4667249

Table 3-3[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Inter-Armoring Water Data

Sample		McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Inter-Armoring Water Spring 2006							Inter-Armoring Water Fall 2006						
Contaminant of Concern		Aquatic Life (chronic)[2]	Human Health (fish consumption only)[2]	Aquatic Life (chronic)[3]	Human Health (consumption of organism only)[3]	Maximum Contaminant Levels (MCLs)[4]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)																				
Arsenic		0.19		0.15	0.00014	0.01	23	30%	0.00493	Location 5	0.001197739	NP	0.002284	22	100%	0.00206	Location 21	0.000684545	NP	0.000844
Chromium		0.21		0.074		0.1	23	43%	0.0105	Location 12	0.0007835	NP	0.005253	22	64%	0.00216	Location 3	0.000376841	NP	0.001459
Copper		0.012		0.009			23	96%	0.0168	Location 12	0.002558957	NP	0.005644	22	100%	0.00435	Location 20	0.001719091	Lognormal	0.002151
Zinc		0.11		0.12	26		23	78%	0.0392	Location 12	0.006906087	NP	0.015444	22	45%	0.0147	Location 17	0.00316975	NP	0.011298
Pentachlorophenol (ug/L)		13		15	3	1	22	0%	ND	NA	0.120045455	NP	0.12032	22	14%	0.25	Location 6	0.135090909	NP	0.149546
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)																				
Acenaphthene	L	520			990		22	32%	3.65	Location 5	0.320768182	NP	2.322804	22	23%	1.81	Location 20	0.096065909	NP	0.910455
Acenaphthylene	L						22	5%	0.0736	Location 10	0.009345455	NP	0.022734	22	18%	0.0506	Location 20	0.008756818	NP	0.012571
Anthracene	L				40,000		22	5%	0.199	Location 5	0.014777273	NP	0.053016	22	14%	0.0161	Location 20	0.006975	NP	0.008004
Benzo[a]anthracene	H, C				0.018		22	5%	0.0134	Location 5	0.006340909	NP	0.006975	22	14%	0.0187	Location 5	0.007029545	NP	0.008187
Benzo[b]fluoranthene	H, C				0.018	0.2	22	0%	ND	NA	0.006004545	NP	0.006016	22	14%	0.0125	Location 6	0.006743182	NP	0.007464
Benzo[k]fluoranthene	H				0.018		22	0%	ND	NA	0.006004545	NP	0.006016	22	14%	0.0136	Location 5	0.006790909	NP	0.007579
Benzo[a]pyrene	H, C						22	0%	ND	NA	0.006004545	NP	0.006016	22	14%	0.0125	Location 6	0.006743182	NP	0.007464
Benzo[g,h,i]perylene	H, C				0.018		22	0%	ND	NA	0.006004545	NP	0.006016	22	9%	0.0125	Location 6	0.006463636	NP	0.007007
Chrysene	H, C				0.018		22	5%	0.0186	Location 5	0.006577273	NP	0.007658	22	14%	0.0236	Location 5	0.007252273	NP	0.008798
Dibenzo[a,h]anthracene	H, C				0.018		22	0%	ND	NA	0.012004545	NP	0.012032	22	9%	0.025	Location 6	0.012945455	NP	0.01403
Fluoranthene	H		54		140		22	5%	0.253	Location 5	0.017231818	NP	0.066169	22	18%	0.111	Location 5	0.012265909	NP	0.033285
Fluorene	L				5300		22	9%	1.99	Location 5	0.098143182	NP	0.994723	22	18%	0.398	Location 20	0.028225	NP	0.207785
Ideno[1,2,3-cd]pyrene	H, C				0.018		22	0%	ND	NA	0.006004545	NP	0.006016	22	9%	0.0125	Location 6	0.006463636	NP	0.007007
Naphthalene	L	620					22	50%	1.13	Location 5	0.085009091	NP	0.603658	22	36%	2.08	Location 20	0.136427273	NP	1.094928
Phenanthrene	L						22	14%	1.73	Location 5	0.086113636	NP	0.865104	22	14%	0.147	Location 20	0.018515909	NP	0.055687
Pyrene	H				4,000		22	5%	0.138	Location 5	0.012004545	NP	0.038157	22	23%	0.0601	Location 5	0.009875	NP	0.020751
Total LPAHs							22	55%	8.699	Location 5	0.592877273	NP	4.651962	22	36%	4.5017	Location 20	0.270425	NP	2.312993
Total HPAHs							22	5%	0.423	Location 5	0.053617045	NP	0.130289	22	18%	0.227	Location 5	0.042479545	NP	0.059128
Total Carcinogenic PAHs			0.031				22	5%	0.032	Location 5	0.027246591	NP	0.027677	22	9%	0.0559	Location 5	0.029075	NP	0.031489
Total PAHs							22	55%	9.122	Location 5	0.627102273	NP	4.857888	22	41%	4.5469	Location 20	0.286938068	NP	2.362321

Table 3-3[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Inter-Armoring Water Data

Sample		Inter-Armoring Water Spring 2007							Inter-Armoring Water Fall 2007						
Contaminant of Concern		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)															
Arsenic		23	13%	0.00713	Location 5	0.000656522	NP	0.0037894	22	100%	0.00202	Location 13	0.001048136	Normal	0.0012339
Chromium		23	13%	0.0227	Location 5	0.00204587	Gamma	0.0039565	22	55%	0.00456	Location 16	0.000855455	Gamma	0.0013579
Copper		23	100%	0.037	Location 5	0.005251739	NP	0.0124144	22	86%	0.00858	Location 16	0.002460227	Gamma	0.0032778
Zinc		23	4%	0.03325	Location 5	0.00511	NP	0.020548	22	64%	0.0222	Location 16	0.00683	Gamma	0.0092531
Pentachlorophenol (ug/L)		23	0%	ND	N/A	0.122847826	NP	0.1233257	22	0%	ND	N/A	0.113995455	Max	0.119
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)															
Acenaphthene	L	23	13%	0.115	Location 20	0.01428913	NP	0.0375184	22	0%	ND	N/A	0.027968182	NP	0.1252719
Acenaphthylene	L	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	9%	0.0673	Location 17	0.0091	NP	0.0212879
Anthracene	L	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Benzo[a]anthracene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Benzo[b]fluoranthene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Benzo[k]fluoranthene	H	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Benzo[a]pyrene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Benzo[g,h,i]perylene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Chrysene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Dibenzo[a,h]anthracene	H, C	23	0%	ND	N/A	0.012284783	NP	0.0123326	22	0%	ND	N/A	0.011886364	NP	0.0118945
Fluoranthene	H	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	32%	0.0173	Location 10	0.008393182	NP	0.0098296
Fluorene	L	23	9%	0.0345	Location 20	0.007754348	NP	0.0101253	22	0%	ND	N/A	0.014925	NP	0.0373472
Ideno[1,2,3-cd]pyrene	H, C	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.005936364	NP	0.0059445
Naphthalene	L	23	0%	ND	N/A	0.006567391	NP	0.0073668	22	0%	ND	N/A	0.047425	NP	0.251117
Phenanthrene	L	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	0%	ND	N/A	0.008931818	NP	0.0201047
Pyrene	H	23	0%	ND	N/A	0.006143478	NP	0.0061656	22	5%	0.0141	Location 10	0.006306818	NP	0.0070073
Total LPAHs		23	17%	0.1495	Location 20	0.026317391	NP	0.0524483	22	9%	0.2481	Location 4	0.040814773	NP	0.0895511
Total HPAHs		23	0%	ND	N/A	0.033921739	NP	0.0341998	22	32%	0.032725	Location 3	0.027119318	NP	0.0302989
Total Carcinogenic PAHs		23	0%	ND	N/A	0.027644565	Normal	0.0277462	22	0%	ND	N/A	0.026720455	NP	0.0267531
Total PAHs		23	17%	0.1495	Location 20	0.054247826	NP	0.0630759	22	36%	0.142575	Location 12	0.047042045	NP	0.0762226

Table 3-4[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Sub-Armoring Water Data

Sample		McCormick & Baxter Record of Decision, 1996, Ambient Water Quality Criteria (AWQCs)		EPA Current, 2007, National Recommended Water Quality Criteria (NRWQCs)		EPA National Primary Drinking Water Regulations (NPDWRs)	Sub-Armoring Water Fall 2005						
Contaminant of Concern		Aquatic Life (chronic)[2]	Human Health (fish consumption only)[2]	Aquatic Life (chronic)[3]	Human Health (consumption of organism only)[3]	Maximum Contaminant Levels (MCLs)[4]	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)													
Arsenic		0.19		0.15	0.00014	0.01	23	100%	0.0332	MBPWPR05-26	0.005318435	Gamma	0.008372
Chromium		0.21		0.074		0.1	23	39%	0.0144	MBPWPR05-09	0.001423913	NP	0.0041061
Copper		0.012		0.009			23	70%	0.0282	MBPWPR05-09	0.002666435	NP	0.0146253
Zinc		0.11		0.12	26		23	100%	0.113	MBPWPR05-09	0.020175652	Gamma	0.0279904
Pentachlorophenol (ug/L)		13		15	3	1	23	4%	0.469	MBPWPR05-17 1	0.85623913	Max	0.469
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)													
Acenaphthene	L	520			990		23	57%	131	MBPWPR05-20	16.9834587	NP	32.649943
Acenaphthylene	L						23	13%	1.22	MBPWPR05-23	0.115984783	NP	0.6744157
Anthracene	L				40,000		23	39%	3.42	MBPWPR05-09	0.534873913	NP	2.8762402
Benzo[a]anthracene	H, C				0.018		23	17%	0.959	MBPWPR05-09	0.066847826	NP	0.4854613
Benzo[b]fluoranthene	H, C				0.018	0.2	23	4%	0.284	MBPWPR05-09	0.02155	NP	0.0747268
Benzo[k]fluoranthene	H				0.018		23	9%	0.355	MBPWPR05-09	0.02505	NP	0.1764327
Benzo[a]pyrene	H, C						23	0%	ND	NA	0.014636957	NP	0.039171
Benzo[g,h,i]perylene	H, C				0.018		23	4%	0.369	MBPWPR05-09	0.025245652	NP	0.182775
Chrysene	H, C				0.018		23	22%	1.05	MBPWPR05-09	0.071343478	NP	0.5282518
Dibenzo[a,h]anthracene	H, C				0.018		23	0%	ND	NA	0.033684783	NP	0.0855918
Fluoranthene	H		54		140		23	61%	7.4	MBPWPR05-07	0.885326087	NP	5.259066
Fluorene	L				5300		23	61%	53.9	MBPWPR05-20	5.860819565	NP	11.587413
Ideno[1,2,3-cd]pyrene	H, C				0.018		23	0%	ND	NA	0.014636957	NP	0.039171
Naphthalene	L	620					23	61%	772	MBPWPR05-09	74.56662826	NP	521.8865
Phenanthrene	L						23	61%	41	MBPWPR05-20	4.795532609	NP	8.90184
Pyrene	H				4,000		23	65%	4.49	MBPWPR05-09	0.521636957	NP	3.1896572
Total LPAHs							23	78%	885.57	MBPWPR05-10	102.7673065	NP	545.396
Total HPAHs							23	65%	14.257	MBPWPR05-09	1.580665217	NP	9.6073952
Total Carcinogenic PAHs			0.031				23	22%	3.017	MBPWPR05-09	0.21563587	NP	1.5174065
Total PAHs							23	78%	885.78	MBPWPR05-10	104.3363837	NP	551.0207

Table 3-4[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Sub-Armoring Water Data

Sample		Sub-Armoring Water Spring 2006							Sub-Armoring Water Fall 2006						
Contaminant of Concern		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)															
Arsenic		23	91%	0.037	Location 3	0.010274	Gamma	0.015433	22	95%	0.0386	Location 18	0.008901909	Gamma	0.014197
Chromium		23	78%	0.0169	Location 11	0.001345543	Log	0.002678	22	23%	0.00106	Location 25	0.000170023	NP	0.000393
Copper		23	70%	0.0352	Location 19	0.005480739	Gamma	0.010686	22	82%	0.00281	Location 15	0.000814545	Gamma	0.001243
Zinc		23	87%	0.388	Location 11	0.036627391	Log	0.071789	22	50%	0.0263	Location 14	0.005918841	NP	0.020705
Pentachlorophenol (ug/L)		23	4%	18.5	Location 6	0.966173913	NP	8.909733	22	14%	0.25	Location 6	0.140886364	NP	0.157789
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)															
Acenaphthene	L	23	74%	22.1	Location 20	4.519845652	Gamma	11.20129	22	73%	19	Location 20	3.401265909	Gamma	8.510198
Acenaphthylene	L	23	4%	0.3065	Location 20	0.02706087	NP	0.158195	22	14%	3.27	Location 17	0.305304545	NP	2.292088
Anthracene	L	23	61%	0.709	Location 5	0.1116	NP	0.514485	22	50%	0.458	Location 9	0.061636364	NP	0.299227
Benzo[a]anthracene	H, C	23	17%	0.0995	Location 5	0.014552174	NP	0.034816	22	18%	0.055	Location 7	0.011006818	NP	0.022519
Benzo[b]fluoranthene	H, C	23	9%	0.06	Location 16	0.009878261	NP	0.021038	22	9%	0.0125	Location 4	0.006759091	NP	0.007478
Benzo[k]fluoranthene	H	23	9%	0.0894	Location 5	0.012967391	NP	0.031414	22	9%	0.0125	Location 6	0.006756818	NP	0.007476
Benzo[a]pyrene	H, C	23	0%	ND	NA	0.008623913	NP	0.013042	22	9%	0.0187	Location 17	0.007043182	NP	0.008199
Benzo[g,h,i]perylene	H, C	23	0%	ND	NA	0.008365217	NP	0.012787	22	14%	0.0125	Location 4	0.007043182	NP	0.007891
Chrysene	H, C	23	22%	0.101	Location 5	0.015763043	NP	0.036583	22	27%	0.0503	Location 7	0.012120455	NP	0.024169
Dibenzo[a,h]anthracene	H, C	23	0%	ND	NA	0.016708696	NP	0.025511	22	14%	0.025	Location 6	0.014088636	NP	0.015779
Fluoranthene	H	23	65%	1.67	Location 7	0.226267391	NP	1.122491	22	59%	10.4	Location 7	0.626252273	NP	5.31164
Fluorene	L	23	65%	10.5	Location 5	1.11671087	NP	6.479794	22	59%	10.3	Location 17	1.13365	NP	6.445857
Ideno[1,2,3-cd]pyrene	H, C	23	0%	0.06	Location 16	0.008365217	NP	0.012787	22	5%	0.0144	Location 17	0.006563636	NP	0.007269
Naphthalene	L	23	74%	726	Location 16	47.51581739	NP	296.5741	22	73%	229	Location 5	13.32279318	NP	118.1517
Phenanthrene	L	23	52%	6.91	Location 5	0.611693478	NP	4.179962	22	59%	6.4	Location 17	0.538752273	NP	3.734635
Pyrene	H	23	48%	0.716	Location 7	0.107506522	NP	0.505947	22	68%	3.14	Location 7	0.230859091	NP	1.66278
Total LPAHs		23	87%	738.2	Location 16	52.83632391	Max	738.2	22	91%	232.325	Location 5	18.44994318	Gamma	50.96557
Total HPAHs		23	65%	2.4248	Location 7	0.374920652	NP	1.744037	22	64%	13.6453	Location 7	0.876945455	NP	7.032138
Total Carcinogenic PAHs		23	22%	0.3217	Location 5	0.055644565	NP	0.127862	22	23%	0.1053	Location 7	0.034867045	NP	0.04283
Total PAHs		23	91%	738.2	Location 16	53.11877957	Max	738.2	22	91%	232.3679	Location 5	19.31512898	Gamma	51.64995

Table 3-4[1]
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary of Sub-Armoring Water Data

Sample		Sub-Armoring Water Spring 2007							Sub-Armoring Water Fall 2007						
Contaminant of Concern		Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value	Number of Samples	Detection Frequency	Max Detection	Max Location	Mean Conc.	Data Distribution	95% UCL Value
Total Metals (mg/L)															
Arsenic		23	100%	0.0522	Location 3	0.007975217	Gamma	0.0123313	22	100%	0.0322	Location 4	0.012603909	Normal	0.0162278
Chromium		23	30%	0.00255	Location 15	0.000561957	NP	0.0021754	22	9%	0.00143	Location 3	0.000261705	NP	0.0005868
Copper		23	96%	0.544	Location 15	0.025327391	NP	0.2599626	22	86%	0.00476	Location 15	0.000787023	NP	0.0017962
Zinc		23	57%	0.0526	Location 15	0.009842609	NP	0.0350178	22	91%	0.0335	Location 16	0.01131	Gamma	0.0153934
Pentachlorophenol (ug/L)		23	0%	ND	N/A	0.385391304	NP	1.527544	22	5%	3.27	Location 16	0.262090909	NP	0.8864325
Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)															
Acenaphthene	L	23	78%	47.5	Location 8	8.430608696	Gamma	23.017762	22	59%	67.6	Location 9	10.81428864	Gamma	27.06195
Acenaphthylene	L	23	13%	0.605	Location 16	0.058121739	NP	0.3422935	22	0%	0.119	Location 6	0.026179545	NP	0.0950922
Anthracene	L	23	52%	1.32	Location 5	0.093793478	NP	0.6669787	22	18%	1.14	Location 9	0.128409091	NP	0.6987505
Benzo[a]anthracene	H, C	23	13%	0.3065	Location 5	0.021832609	NP	0.0786941	22	9%	0.153	Location 7	0.013977273	NP	0.0434328
Benzo[b]fluoranthene	H, C	23	4%	0.3065	Location 5	0.019873913	NP	0.0767302	22	0%	0.00595	Location 4	0.005934091	NP	0.0059427
Benzo[k]fluoranthene	H	23	4%	0.3065	Location 5	0.02	NP	0.0768605	22	5%	0.0128	Location 7	0.006247727	NP	0.0068367
Benzo[a]pyrene	H, C	23	4%	0.3065	Location 5	0.020430435	NP	0.0773454	22	0%	0.00595	Location 4	0.005934091	NP	0.0059427
Benzo[g,h,i]perylene	H, C	23	4%	0.3065	Location 5	0.020217391	NP	0.0770977	22	0%	0.00595	Location 4	0.005934091	NP	0.0059427
Chrysene	H, C	23	13%	0.3065	Location 5	0.022202174	NP	0.0790195	22	18%	0.151	Location 7	0.015206818	NP	0.0447838
Dibenzo[a,h]anthracene	H, C	23	4%	0.615	Location 5	0.039663043	NP	0.1537591	22	0%	0.0119	Location 4	0.011884091	NP	0.0118927
Fluoranthene	H	23	57%	2.75	Location 7	0.193456522	NP	1.4338639	22	36%	12.2	Location 7	0.648179545	NP	6.1322076
Fluorene	L	23	65%	20.3	Location 5	1.903104348	NP	12.450431	22	36%	25.5	Location 9	3.114015909	Max	25.5
Ideno[1,2,3-cd]pyrene	H, C	23	4%	0.3065	Location 5	0.020478261	NP	0.0774106	22	0%	0.00595	Location 4	0.005934091	NP	0.0059427
Naphthalene	L	23	30%	848	Location 5	69.12391087	NP	150.01959	22	18%	407	Location 16	24.13220455	NP	325.09434
Phenanthrene	L	23	39%	17	Location 5	0.989636957	NP	8.5384859	22	14%	14.4	Location 9	1.111709091	NP	8.2170087
Pyrene	H	23	43%	1.31	Location 7	0.089547826	NP	0.6575389	22	36%	5.53	Location 7	0.326043182	NP	2.81037
Total LPAHs		23	87%	928.12	Location 5	80.49585109	NP	161.80147	22	59%	445.89	Location 16	38.91800568	Gamma	105.28322
Total HPAHs		23	57%	4.1375	Location 7	0.292818478	NP	2.0888127	22	45%	18.0468	Location 7	0.997402273	NP	9.0965488
Total Carcinogenic PAHs		23	13%	1.38025	Location 5	0.097154348	NP	0.3538238	22	18%	0.1658	Location 7	0.034511364	NP	0.064582
Total PAHs		23	91%	929.17	Location 5	80.7797	NP	163.05053	22	73%	445.89	Location 16	39.87969886	Gamma	105.23271

Table 3-5
McCormick and Baxter Creosoting Company
Portland, Oregon
Summary Notes for Tables 3-2 to 3-4

NOTES:

[1] The 1996 Record of Decision (ROD) specifies the remedial action objects of the sediment cap as 1) preventing human and aquatic organisms from direct contact with contaminated sediment, and 2) minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state Ambient Water Quality Criteria (AWQCs).

[2] National Recommended Water Quality Criteria (NRWQCs) published as of August 15, 2007 are included for comparison (see http://www.epa.gov/waterscience/criteria/wqcriteria.html). The current publication includes criteria revisions published in 2002 National Recommended Water Quality Criteria: 2002 table (EPA-822-R-02-047) and 2003 Revised human Health Water Quality Criteria (EPA-822-F-03-012). Note that the aquatic life chronic criteria for pentachlorophenol has been adjusted to site-specific pH (7.5, representing a mid-range of the pH values measured in surface water at the site), and therefore differs from the standard table value. Criteria for metals (Cr, Cu, Zn) have not been adjusted for site-specific hardness. Carcinogenic risk-based numbers reflect a carcinogenicity risk of 10^{-6}.

[3] National Primary Drinking Water Regulations Maximum Contaminant Levels (MCLs) promulgated as of August 15, 2007 are included for comparison (see http://www.epa.gov/safewater/contaminants/index.html#primary).

[4] Location 17 sampled twice, both samples are included in the result table. This is not a duplicate sample because sampling equipment was removed and re-installed between the two samples.

[5] No post sampling water quality parameter because the inter-armoring sampling device was removed prematurely.

[6] Samples were inadvertently left out of refrigerator by TestAmerica; all sample results for PAHs & PCP are estimates only.

[7] Comparison criteria for metals was converted to ug/L from mg/l to be consistent with data reported in ug/L.

[8] Results for PCP and Naphthalene for location 6 in tables published prior to September 11th 2007 are not correct.

[9] Sample surrogate (fluorene-d10) just below control limits at 24.8%.

[10] PAH & PCP data unavailable due to bottle breakage at TestAmerica.

ADDITIONAL NOTES:

A. The number of significant figures presented in the table do not reflect true accuracy presented by the laboratory results. Data should only retain 3 significant figures. Due to statistical evaluation using Microsoft Excel, additional significant figures may be shown.

B. Samples collected during the Fall 2002 Event were collected by an EPA dive team and analyzed by EPA, Region 10, Manchester Environmental Laboratory, Port Orchard, Washington.

KEY:

AWQC	Ambient Water Quality Criteria
C	Carcinogenic PAH (CPAH)
CCC	Criterion Continuous Concentration
EPA	Environmental Protection Agency
Gamma	Gamma Distribution
H	High Molecular Weight PAH (HPAH)
HS	Henry Sampler
J	Estimated Value
L	Low Molecular Weight PAH (LPAH)
MCL	Drinking Water Maximum Contaminant Levels
MRL	Method Reporting Limit
MDL	Method Detection Limit
mg/L	milligrams per liter
NRWQC	National Recommended Water Quality Criteria
NPDWR	National Primary Drinking Water Regulations
N/A	Not Applicable
NP	Nonparametric Distribution
PAH	Polyaromatic Hydrocarbons
ROD	Record of Decision
U	Value Below MDL (value represents MDL)
UJ	Value Below Estimated MDL (value represents estimated MDL)
ug/L	micrograms per liter

Bold	Indicates Analyte was detected, but does not exceed the most stringent criteria.
Bold	Indicates results that exceed the lowest (most stringent) of the sediment cap performance goals and comparison criter
Inverse	Indicates a value less than the MDL where the MDL exceeds the lowest sediment cap performance goal and comparison criteria. Only used on the Spring and Fall 2007 data tables.

Table 4-1
Comparison Criteria Exceedance Summary 2005 - 2007
McCormick and Baxter Creosoting Company
Portland, Oregon

Analyte	Comparison Criteria	2005				Spring 2006						Fall 2006					
		Surface Water		Sub-armoring Water		Surface Water		Inter-armoring Water		Sub-armoring Water		Surface Water		Inter-armoring Water		Sub-armoring Water	
		Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location
Arsenic	0.00014 mg/L	25	All	25	All	6	4, 15, 24, 25, 27	7	5, 7, 12, 13, 17, 20, 25	20	Multiple	23	Multiple	22		22	Multiple
Chromium	0.074 mg/L																
Copper	0.009 mg/L			1	9	3	9, 18, 27	1	12	4	11, 14, 15, 19						
Zinc	0.11 mg/L			1	9												
PCP	1 µg/L																
Acenaphthene	520 µg/L																
Anthracene	40,000 µg/L																
Benzo (a) anthracene	0.018 µg/L			4	7, 9, 20, 26					3	5, 7, 9,			1	5		
Benzo (a) pyrene	0.018 µg/L			1	9					1	5						
Benzo (b) fluoranthene	0.018 µg/L			1	9					2	5, 9						
Benzo (k) fluoranthene	0.018 µg/L			1	9												
Chrysene	0.018 µg/L			3	9, 20, 26	1	25	1	5	3	5, 9, 11			1	5		
Dibenzo (a,h) anthracene	0.018 µg/L																
Fluoranthene	54 µg/L																
Fluorene	5,300 µg/L																
Ideno (1,2,3-cd) pyrene	0.018 µg/L																
Naphthalene	620 µg/L			2	9, 10					1	16						
Pyrene	4,000 µg/L																
Total CPAHs	0.031 µg/L			4	7, 9, 20, 26	1	13	1	5	5	5, 7, 9, 10, 11			1	5	4	7, 9, 10, 17
Total Comparison Criteria Exceedances		25		43		11		10		39		23		25			

Notes:
AWQCs = Ambient Water Quality Criteria (1996)
Comparison Criteria = Most conservative values from AWQCs, NRWQCs, and NPDWRs
mg/L = milligrams per liter
NPDWRs = National Primary Drinking Water Regulations
NRWQCs = National Recommended Water Quality Criteria
ug/L = micrograms per liter
PCP = Pentachlorophenol
CPAH = Carcinogenic Polynuclear Aromatic Hydrocarbons

Table 4-1
Comparison Criteria Exceedance Summary 2005 - 2007
McCormick and Baxter Creosoting Company
Portland, Oregon

Analyte	Comparison Criteria	Spring 2007						Fall 2007					
		Surface Water		Inter-armoring Water		Sub-armoring Water		Surface Water		Inter-armoring Water		Sub-armoring Water	
		Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location	Total Exceedances	Sampling Location
Arsenic	0.00014 mg/L	25	All	3	3, 5, 21	23	All	12	Multiple	18	Multiple	22	All
Chromium	0.074 mg/L												
Copper	0.009 mg/L			4	4, 5, 6, 21	2	12, 15						
Zinc	0.11 mg/L												
PCP	1 µg/L											1	16
Acenaphthene	520 µg/L												
Anthracene	40,000 µg/L												
Benzo (a) anthracene	0.018 µg/L					2	7, 12					2	7, 10
Benzo (a) pyrene	0.018 µg/L					1	10						
Benzo (b) fluoranthene	0.018 µg/L					1	10						
Benzo (k) fluoranthene	0.018 µg/L					1	10						
Chrysene	0.018 µg/L					3	7, 10, 13					2	7, 10
Dibenzo (a,h) anthracene	0.018 µg/L					1	10						
Fluoranthene	54 µg/L												
Fluorene	5,300 µg/L												
Ideno (1,2,3-cd) pyrene	0.018 µg/L					1	10						
Naphthalene	620 µg/L					1	5						
Pyrene	4,000 µg/L												
Total CPAHs	0.031 µg/L					3	7, 10, 13					2	7,10
Total Comparison Criteria Exceedances		25		7		39		12		18		29	

Notes:
AWQCs = Ambient Water Quality Criteria (1996)
Comparison Criteria = Most conservative values from AWQ
mg/L = milligrams per liter
NPDWRs = National Primary Drinking Water Regulations
NRWQCs = National Recommended Water Quality Criteria
ug/L = micrograms per liter
PCP = Pentachlorophenol
CPAH = Carcinogenic Polynuclear Aromatic Hydrocarbons

Table 4-2
Maximum Concentration Summary
McCormick and Baxter Creosoting Company
Portland, Oregon

Sampling Event	Maximum Detected Concentration						
	2002	2003	2005	Spring 2006	Fall 2006	Spring 2007	Fall 2007
Surface Water							
Arsenic mg/L	0.001	0.002	0.001	0.002	0.007	0.0004	0.001
Chromium mg/L	0.002	0.005	ND	0.005	0.002	0.002	0.001
Copper mg/L	0.021	0.021	0.003	0.017	0.003	0.003	0.002
Zinc mg/L	0.018	0.019	0.008	0.040	0.005	0.022	0.004
PCP ug/L	0.079	NA	ND	ND	ND	ND	ND
Acenaphthene ug/L	9.800	ND	0.097	ND	0.166	0.013	0.411
Fluoranthene ug/L	11.900	0.078	ND	0.040	0.014	0.013	0.027
Naphthalene ug/L	3.300	ND	0.911	0.190	0.930	0.025	1.330
Total CPAHs ug/L	4.220	0.101	ND	0.053	ND	ND	ND
Total PAHs ug/L	61.500	0.282	1.044	0.281	1.188	0.111	1.990
Inter-Armoring Water							
Arsenic mg/L	--	--	--	0.005	0.002	0.007	0.020
Chromium mg/L	--	--	--	0.011	0.002	0.023	0.005
Copper mg/L	--	--	--	0.017	0.004	0.037	0.009
Zinc mg/L	--	--	--	0.039	0.015	0.067	0.022
PCP ug/L	--	--	--	ND	0.250	ND	ND
Acenaphthene ug/L	--	--	--	3.650	1.810	0.115	ND
Fluoranthene ug/L	--	--	--	0.253	0.111	ND	0.017
Naphthalene ug/L	--	--	--	1.130	2.080	ND	ND
Total CPAHs ug/L	--	--	--	0.032	0.056	ND	ND
Total PAHs ug/L	--	--	--	9.122	4.457	0.150	0.081
Sub-Armoring Water							
Arsenic mg/L	--	--	0.033	0.037	0.039	0.052	0.032
Chromium mg/L	--	--	0.014	0.017	0.001	0.003	0.001
Copper mg/L	--	--	0.028	0.035	0.003	0.544	0.005
Zinc mg/L	--	--	0.113	0.388	0.026	0.053	0.036
PCP ug/L	--	--	0.469	18.500	0.250	ND	3.270
Acenaphthene ug/L	--	--	131.000	22.100	19.000	47.500	67.600
Fluoranthene ug/L	--	--	7.400	1.670	10.400	2.750	12.200
Naphthalene ug/L	--	--	772.000	726.000	229.000	848.000	407.000
Total CPAHs ug/L	--	--	3.017	0.322	0.105	0.211	0.166
Total PAHs ug/L	--	--	885.000	738.000	232.000	929.150	445.890

Notes:
mg/L = milligrams per liter
ug/L = micrograms per liter
PCP = Pentachlorophenol
PAH = Polynuclear Aromatic Hydrocarbons
CPAH = Carcinogenic Polynuclear Aromatic Hydrocarbons
ND = Not Detected
NA = Not Analyzed
-- Not Sampled

Table 4-3
Detection Frequency Summary
McCormick and Baxter Creosoting Company
Portland, Oregon

Sampling Event	Detection Frequency						
	2002	2003	2005	Spring 2006	Fall 2006	Spring 2007	Fall 2007
Surface Water							
Arsenic	27%	81%	100%	22%	95%	100%	48%
Chromium	33%	100%	0%	74%	52%	58%	52%
Copper	100%	100%	81%	74%	100%	100%	88%
Zinc	100%	100%	88%	87%	27%	35%	64%
Total PAHs	60%	43%	19%	30%	23%	8%	68%
Inter-Armoring Water							
Arsenic	--	--	--	30%	100%	13%	78%
Chromium	--	--	--	43%	64%	17%	52%
Copper	--	--	--	96%	100%	100%	83%
Zinc	--	--	--	78%	45%	4%	60%
Total PAHs	--	--	--	55%	41%	17%	35%
Sub-Armoring Water							
Arsenic	--	--	100%	91%	95%	100%	100%
Chromium	--	--	0%	78%	23%	28%	8%
Copper	--	--	70%	70%	82%	96%	88%
Zinc	--	--	100%	87%	50%	52%	92%
Total PAHs	--	--	78%	91%	91%	88%	75%

Notes:
PAH = Polynuclear Aromatic Hydrocarbons
-- Not Sampled

A Photographic Documentation

McCormick & Baxter Creosoting Company Site
Portland, Oregon

Photographed by: Lenna Cope (LC)

Photo 1 Diver preparing to sample sub-armoring water, Spring 2007.

Direction: Southeast	*Date: 3/16/2007*	*Time: 9:06*	*Photographed by: LC*

Photo 2 Equipment set up for sampling with diver assistance, Spring 2007.

Direction: Northwest	*Date: 3/16/2007*	*Time: 9:00*	*Photographed by: LC*

Photographed by:
Lenna Cope (LC)

Photo 3 Equipment set up for sampling with diver assistance, Fall 2007.

Direction: North	*Date: 9/17/2007*	*Time: 11:22*	*Photographed by: LC*

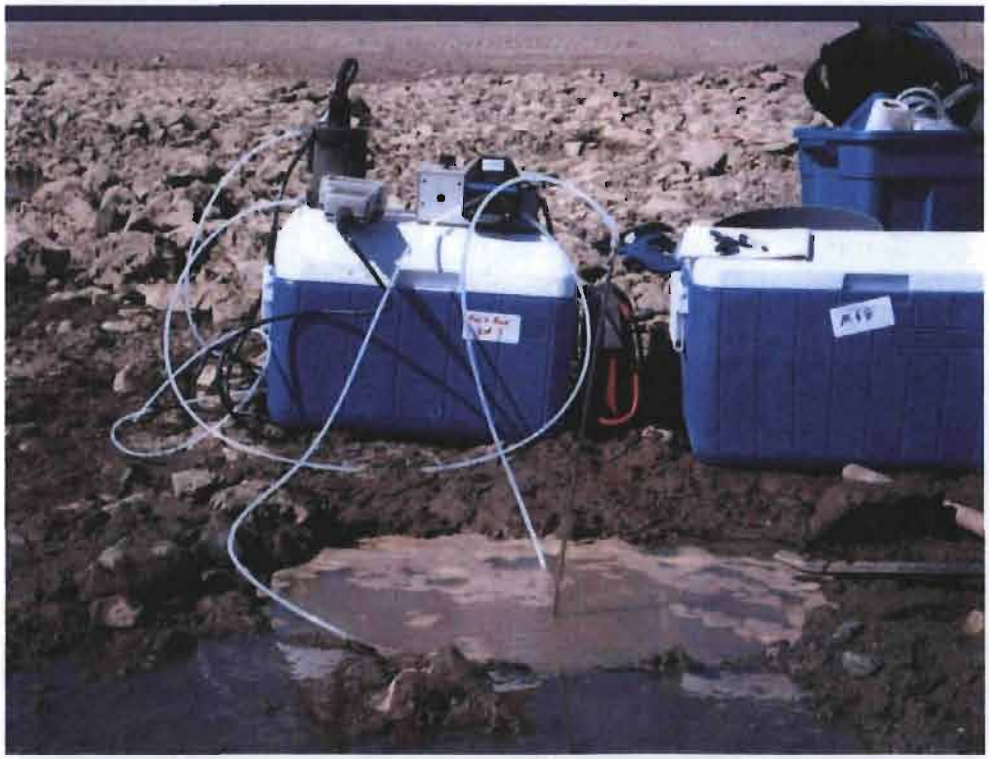

Photo 4 Equipment set up for locations sampled from shore, Fall 2007.

Direction: North	*Date: 9/21/2007*	*Time: 13:18*	*Photographed by: LC*

McCormick & Baxter Creosoting Company Site
Portland, Oregon

Photographed by:
Lenna Cope (LC)

Photo 5 Sub-armoring sample collection at location #17, Fall 2007.

Direction: South	*Date: 9/19/2007*	*Time: 17:13*	*Photographed by: LC*

Photo 6 Removal of rock armoring for sub-armoring sample collection at location #3, Fall 2007.

Direction: West	*Date: 9/21/2007*	*Time: 13:09*	*Photographed by: LC*

Photographed by:
Lenna Cope (LC)

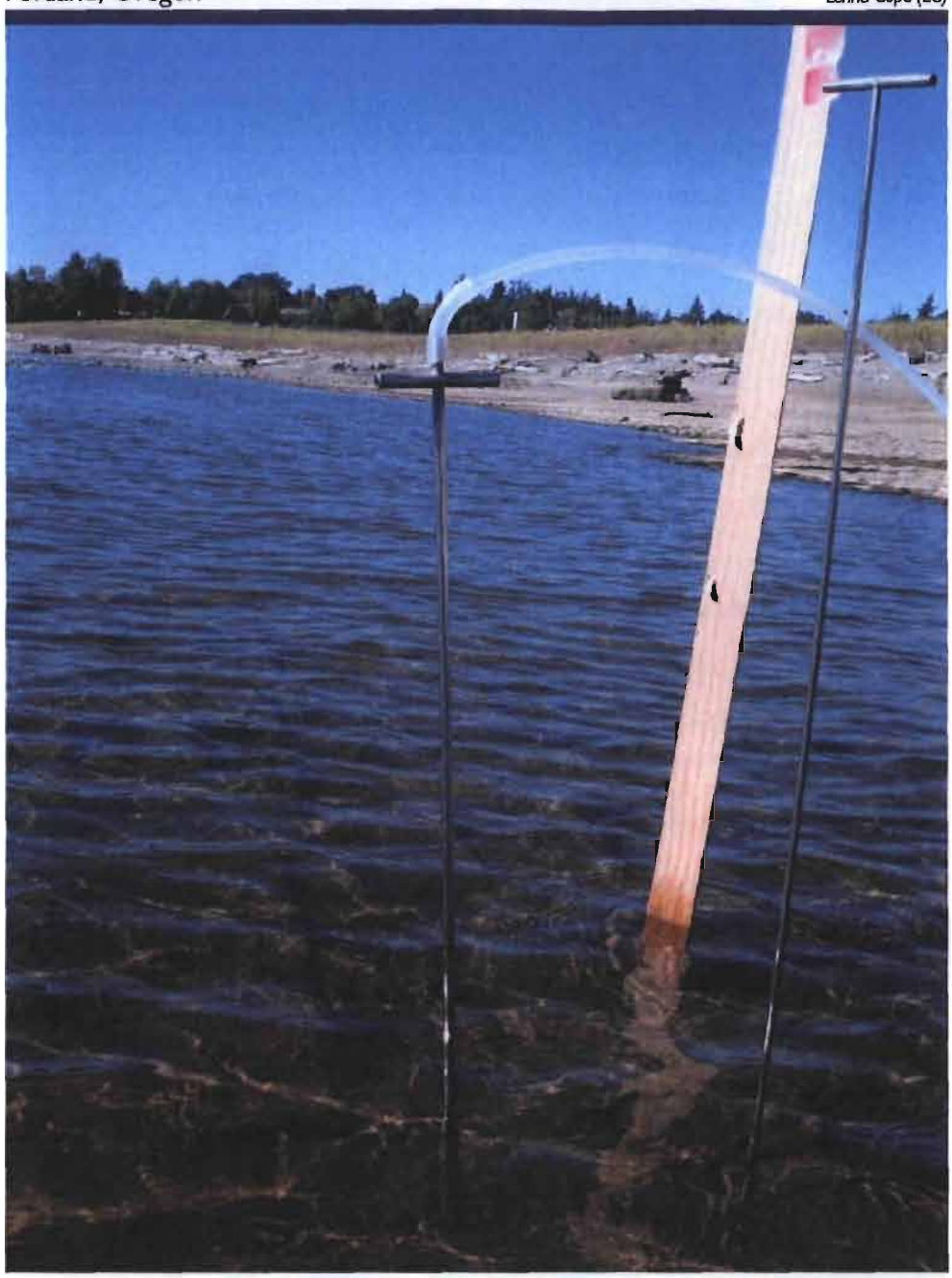

Photo 7 Sub-armoring sample collection at location #2, Fall 2007.

Direction: North	*Date: 9/21/2007*	*Time: 14:43*	*Photographed by: LC*

B Laboratory Analytical Reports and QA Memoranda for Surface Water, Inter-Armoring, and Sub-Armoring Water Spring 2007 Sampling Event

(Included only with the O&M Report CD)

C Laboratory Analytical Reports and QA Memoranda for Surface Water, Inter-Armoring Water, and Sub-Armoring Water Fall 2007 Sampling Event

(Included only with the O&M Report CD)

D Global Diving Fall 2007 Sampling Video

Attachment H

002688.OY28

Infiltration Pond MW-59s Groundwater Quality Assessment

McCormick & Baxter Creosoting Company Site Portland, Oregon

Task Order No. 71-03-28

May 2008

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
Northwest Region
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.

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2-1 Monitoring Well Location Map

Table

3-1 Groundwater Analytical Results MW-59s, McCormick and Baxter Creosoting Company, Portland, Oregon

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List of Abbreviations and Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
ACLs	Alternate Concentration Limits
COC	Contaminate of Concern
DEQ	Oregon Department of Environmental Quality
DO	Dissolved Oxygen
E & E	Ecology and Environment, Inc.
EPA	United States Environmental Protection Agency
Lpm	Liters per minute
McCormick & Baxter	McCormick & Baxter Creosoting Company
MCLs	Maximum Contaminant Levels
mg/L	milligram per liter
NAVD	North American Vertical Datum
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
PAHs	polynuclear aromatic hydrocarbons
PCP	pentachlorophenol
ROD	Record of Decision
SEC	Specific Electrical Conductance
Site	McCormick & Baxter Creosoting Company Site, Portland, Oregon
µg/L	microgram per liter

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1 Introduction

Ecology and Environment, Inc. (E & E), under contract with the Oregon Department of Environmental Quality (DEQ) (Task Order 71-03-28) has prepared this Infiltration Pond MW-59s Groundwater Quality Report for the McCormick & Baxter Creosoting Company (McCormick & Baxter) site located in Portland, Oregon. This report summarizes sampling activities and analytical results for the February 28, 2007 and October 3, 2007, MW-59s sampling events. The site, a former wood-treating facility, is located along the Willamette River at 6900 North Edgewater Street. This summary is being prepared as Attachment H to the Operation and Maintenance (O&M) Report (January through December 2007).

In 2005, a soil cap was installed at the site as part of the remedial action. One component of the soil cap is an infiltration pond constructed at the southwest corner of the site to collect all surface water runoff from the site. A groundwater monitoring well, MW-59s, was installed downgradient from the infiltration pond in 2005 to monitor contaminant levels in groundwater. As specified in the draft O&M Plan (DEQ 2007), four quarters of groundwater samples were to be collected from MW-59s to evaluate the potential for subsurface contaminants to be mobilized by the upland cap infiltration pond. A total of four samples have been collected from MW-59s to date. The intent was to collect a groundwater sample representing 4 seasonal quarters; however, two of the samples were collected in the fall (November 2006 and October 2007) while no samples were collected during the summer months. The first sampling event occurred on April 26, 2006 and corresponds to the second quarter; the second sampling event occurred on November 3, 2006 and represents the fourth quarter; the third monitoring event occurred on February 28, 2007 and represents the first quarter; and the fourth sampling event was scheduled for August 2007 to represent the 3rd quarter but was collected on October 3, 2007 and represents a second fourth quarter sample.

Samples were analyzed for the groundwater contaminants of concern (COCs) as identified in the Record of Decision (EPA 1996). COCs include:

- Polynuclear Aromatic Hydrocarbons (PAHs);
- Pentachlorophenol (PCP); and
- Metals (arsenic, chromium, copper, and zinc).

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2 Sampling Methodology, Handling, and Analysis

This section describes the investigative techniques that were used to conduct the third and fourth sampling events for MW-59s. The investigative techniques for the first and second sampling events are described in Attachment I of the 2006 O&M Report (E&E 2007). The location of MW-59s is shown on Figure 2-1. The following sections describe the sampling methodology, sample handling procedures, and laboratory analyses utilized.

2.1 Sampling Methodology

Groundwater samples were collected from MW-59s utilizing a variable speed, submersible Fultz pump. The pump was lowered into the screened interval of the well so that water withdrawn was representative of the aquifer. The initial pumping rate was set at no more than 0.5 liters per minute (Lpm) and slowly increased such that drawdown in the well did not exceed 0.33 feet. A water quality meter equipped with a flow-through cell was used to monitor the following water quality parameters: pH, specific electrical conductance (SEC), temperature, oxidation reduction potential (ORP), dissolved oxygen (DO), and turbidity. A minimum of one tubing volume (including the volume of water in the pump and the flow-through cell) was purged prior to recording water quality parameters. Water quality parameters were recorded in approximately 5-minute intervals for the remainder of the purge. Water quality parameters were recorded and are included in Table 3-1. Purge water was collected in a 5-gallon bucket and transferred to a 55-gallon steel drum containing other site purge water for subsequent disposal. Collection proceeded after water quality parameters had stabilized to within the following criteria: pH +/- 0.1 pH units, SEC +/- 3% S/cm; ORP +/- 10 millivolts; Turbidity +/- 10; nephelometric turbidity units; DO: +/- 0.3 milligrams per liter (mg/L). Once parameters had stabilized, groundwater samples were collected directly into sample containers from the pump.

After each use, the Fultz pump was decontaminated through a two-step Alconox®/de-ionized water rinse. The Fultz pump was decontaminated by submersion and operation in a bucket with Alconox® and de-ionized water solution. The pump was engaged at a high-output volume for no less than two minutes. The pump was then transferred to a bucket filled with de-ionized water and operated again for no less than one minute. Disposable polyethylene tubing was used to collect each groundwater sample; therefore, no decontamination of the tubing was necessary.

2.2 Sample Handling and Analysis

Upon collection, samples were labeled, sealed in plastic bags, and placed on ice in a cooler for transport to the contract laboratory. Analytical services were provided by Test America Analytical Testing Corporation in Beaverton, Oregon, under contract to DEQ. Proper chain of custody procedures were followed from sample collection to analysis.

All groundwater samples were analyzed using the following methods:

- PAHs and PCP by EPA SW-846 Method 8270-SIM.
- Total arsenic, copper, chromium and zinc by EPA 6000/7000 series methods.

3 Sampling Results

This section describes the analytical results for samples collected for all four sampling events. Sections are organized by constituent(s). Analytical results are compared to Primary Drinking Water Standard Maximum Contaminant Levels (MCLs). Alternate Concentration Limits (ACLs) were established in the Record of Decision (EPA 1996) as protective cleanup levels for groundwater at the McCormick & Baxter Site due to the technical impracticability of restoring groundwater to drinking water standards. However, as described in the Second Five-Year Review (DEQ 2006), the EPA has determined that ACLs are not valid as substitutes for MCLs in groundwater at any site. As such, MCLs are Applicable or Relevant and Appropriate Requirements for the McCormick & Baxter Site and are therefore included herein as a point of reference.

Analytical results from all four MW-59s sampling events are presented in Table 3-1, along with MCLs.

3.1 Total Metals

Groundwater samples were analyzed for total arsenic, chromium, copper, and zinc by EPA 6000/7000 series methods.

Total arsenic concentrations in samples ranged from 0.008 to 0.0225 mg/L (fourth event). Arsenic was detected in each of MW-59s four quarters of sampling. During site-wide groundwater sampling in Spring 2006, arsenic was detected in 72 of the 79 site wells. Three of the four MW-59s arsenic results exceed the MCL of 0.01 mg/L. Arsenic concentrations increased between the first and second sampling events, decreased between the second and third events, and then increased again between the third and fourth events; there is no clear indication that arsenic levels are increasing due to contaminants being mobilized by the upland cap infiltration pond.

Total chromium concentrations in samples ranged from 0.0011 to 0.00474 mg/L (fourth event). Chromium was detected in MW-59s each of the four quarters of sampling. During site-wide groundwater sampling in Spring 2006, chromium was detected in 72 of the 79 site wells. The MCL for chromium (0.1 mg/L) was not exceeded during any of the four quarters of sampling. Chromium concentrations increased slightly with each event; however, levels are still well below the MCL of 0.1 mg/L.

Total copper concentrations in samples ranged from 0.0005 to 0.0011 mg/L (November 3, 2006). Copper was detected in MW-59s each of the four quarters of

sampling. During site-wide groundwater sampling in Spring 2006, copper was detected in 67 of the 79 site wells. The MCL for copper (1.3 mg/L) was not exceeded during any of the four quarters of sampling. Copper concentrations have increased and decreased between various sampling events; there is no clear indication that they are increasing due to contaminants being mobilized by the upland cap infiltration pond.

Total zinc concentrations in samples ranged from 0.0056 to 0.00845 mg/L (October 3, 2007). Zinc was detected in each of MW-59s four quarters of sampling. During site-wide groundwater sampling in Spring 2006, zinc was detected in 49 of the 79 site wells. The MCL for zinc (5.0 mg/L) was not exceeded during any of the four quarters of sampling. Zinc concentrations increased slightly with each event; however, levels are still well below the MCL of 5.0 mg/L.

3.2 Pentachlorophenol

Groundwater samples were analyzed for PCP by EPA SW-846 Method 8270-SIM. PCP was not detected in MW-59s during any of the four sampling events. Detection limits for PCP ranged from 0.238 μg/L to 1.0 μg/L.

3.3 Polynuclear Aromatic Compounds

Groundwater samples were analyzed for PAHs by EPA SW-846 Method 8270-SIM. During the first three sampling events, PAHs were not detected in MW-59s. The method reporting limits for dibenzo(a,h)anthracene ranged from 0.0943 μg/L to 0.1 μg/L; method reporting limits for the remaining PAHs ranged from 0.0472 μg/L to 0.05 μg/L during the first three sampling events. During the fourth sampling event, anthracene, naphthalene, and phenanthrene were detected. However, anthracene and phenanthrene were detected at concentrations that were lower than the method reporting limits but above instrumental detection limits for the first three events (0.0121 μg/L and 0.0259 μg/L, respectively). Naphthalene was detected at a concentration of 0.257 μg/L. There are no MCLs established for naphthalene, anthracene or phenanthrene.

4 Summary

Metal concentrations for chromium and zinc have increased slightly each sampling event; however, metal concentrations for arsenic and copper have fluctuated. Arsenic and copper concentrations were highest during the third and fourth quarters of the year. During the four sampling events, arsenic concentrations in three of the four events have exceeded the MCL of 0.01 mg/L. All other detections for metals and PAHs were below the corresponding MCLs (where such MCLs exist). No PCP was detected during the four sampling event.

The Draft O&M Plan dictates that MW-59s be monitored for a total of four quarters; this monitoring requirement was fulfilled by the sampling event on October 3, 2007. However, because no clear pattern has developed to either support or deny the potential for subsurface contaminants to be mobilized by the upland cap infiltration pond, and because PAHs were only detected in the most recent samples collected from MW-59s, a definitive determination cannot be made regarding contaminant migration from the upland cap infiltration pond.

Continued sampling of MW-59s would provide a more comprehensive data set to show trends in contaminant levels over time. Considering the relatively low contaminant levels observed in this well, sampling should occur on a less frequent basis. We recommend sampling MW-59s annually in August until 2010 (3 additional sampling events) to observe whether there is a trend developing due to Site conditions or the slight increases in low level concentrations of metals and detections of PAHs are normal groundwater fluctuations for the Site.

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5 References

Ecology and Environment, Inc. (E & E), March 2007. *Operation and Maintenance Report (October 2005 through December 2006), McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

Oregon Department of Environmental Quality (Ecology). March 2007. *Draft Final Operation and Maintenance Plan for McCormick and Baxter Creosoting Company Superfund Site Portland, Multnomah County, Oregon*, ORD00020603.

_____. September 2006. *Second Five-Year Review for McCormick and Baxter Creosoting Company Superfund Site, Portland, Multnomah County, Oregon*, ORD009020603.

United States Environmental Protection Agency. March 1996. *Record of Decision, McCormick and Baxter Creosoting Company, Portland Plant, Portland, Oregon.*

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Figures

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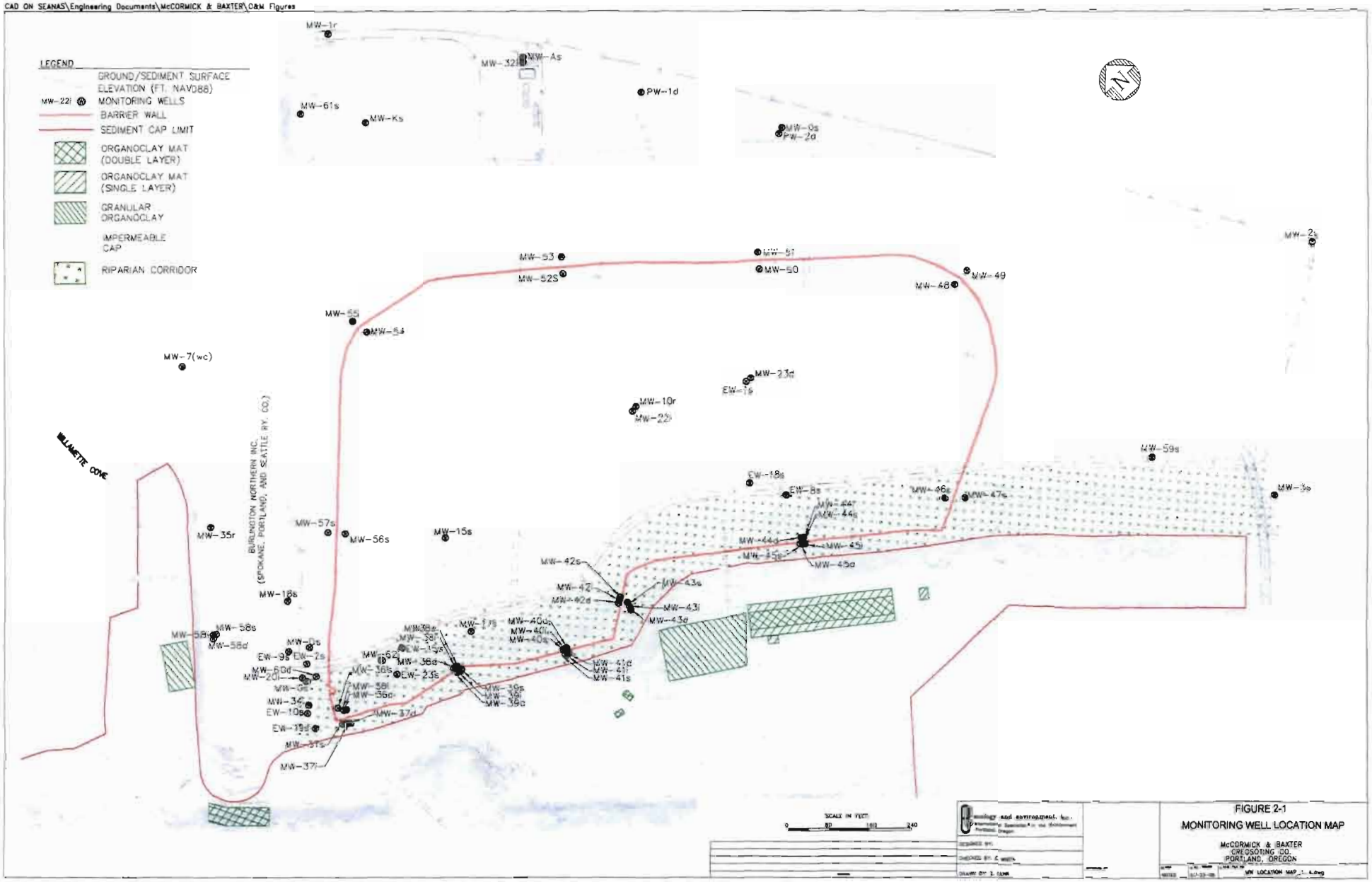
CAD ON SEANAS\Engineering Documents\McCORMICK & BAXTER\O&M Figures



Tables

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TABLE 3-1
Groundwater Analytical Results MW-59s
McCormick and Baxter Creosoting Company
Portland, Oregon

SAMPLE LOCATION			MW-59s (2nd Quarter 2006)		MW-59s (4th Quarter 2006)		MW-59s (1st Quarter 2007)		MW-59s (3rd Quarter 2007)	
Sample ID		Groundwater Performance Goals								
Sample Date			4/26/2006		11/3/2006		2/28/2007		10/3/2007	
Sample Time			18:01		14:47		12:00		9:58	
Well Depth			shallow		shallow		shallow		shallow	
NAPL (Historically)			--		--		--		--	
Inside/Outside Barrier Wall			outside		outside		outside		outside	
CONTAMINANT OF INTEREST		MCL								
Total Metals (mg/L)										
Arsenic		0.01	**0.0080**		**0.0197**		**0.0122**		**0.0225**	
Chromium		0.10	**0.0011**		**0.0015**		**0.00319**		**0.00474**	
Copper		1.30	**0.0005**	J	**0.0011**	J	**0.000520**	J	**0.00107**	J
Zinc		5.00	**0.0056**		**0.0075**		**0.00707**		**0.00845**	
Polyaromatic Hydrocarbons (ug/L)										
Acenaphthene	L		0.0472	U	0.0500	U	0.0495	U	0.0119	
Acenaphthylene	L		0.0472	U	0.0500	U	0.0495	U	0.0119	
Anthracene	L		0.0472	U	0.0500	U	0.0495	U	**0.0121**	J
Benzo (a) anthracene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Benzo (a) pyrene	H, C	0.2	0.0472	U	0.0500	U	0.0495	U	0.0119	
Benzo (b) fluoranthene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Benzo (k) fluoranthene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Benzo (ghi) perylene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Chrysene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Dibenzo (a,h) anthracene	H, C		0.0943	U	0.1000	U	0.0990	U	0.0238	
Fluoranthene	H		0.0472	U	0.0500	U	0.0495	U	0.0119	
Fluorene	L		0.0472	U	0.0500	U	0.0495	U	0.0119	
Indeno (1,2,3-cd) pyrene	H, C		0.0472	U	0.0500	U	0.0495	U	0.0119	
Naphthalene	L		0.0472	U	0.0500	U	0.0495	U	**0.257**	
Pentachlorophenol	L		NA		1.0000	U	0.9900	U	0.238	
Phenanthrene	L		0.0472	U	0.0500	U	0.0495	U	**0.0259**	
Pyrene	H		0.0472	U	0.0500	U	0.0495	U	0.0119	
Total LPAHs			0.1416	U	0.6500	U	0.6435	U	**0.2950**	
Total HPAHs			0.2596	U	0.2750	U	0.2723	U	0.0655	U
Total Carcinogenic PAHs			0.2124	U	0.2250	U	0.2228	U	0.0536	U
Total PAHs			0.4012	U	0.9250	U	0.9158	U	0.3605	U
FIELD PARAMETERS										
Groundwater Elevation (ft NAVD)			**17.10**		**12.01**		**16.52**		**23.73**	
Temperature (°c)			**14.60**		**14.02**		**10.51**		**14.43**	
Oxidation Reduction Potential (mV)			**-20.00**		**13.60**		**44.7**		**-19.50**	
pH			**5.94**		**5.77**		**5.89**		**5.90**	
Specific Conductance (Ms/cm)			**0.54**		**0.36**		**0.264**		**0.52**	
Turbidity (NTU)			**40.80**		**11.60**		**3.42**		**9.15**	
Dissolved Oxygen (mg/L)			**0.00**		**0.40**		**0.7**		**0.32**	

TABLE B-1 DEFINITIONS AND END NOTES

MCL = Primary Drinking Water Standard Maximum Contaminant Level.
MRL= Method Reporting Limit. Reporting Level at, or above, the lowest standard of the Calibration
MDL= Method Detection Limit. Reporting Level at, or above, the statistically derived limit based on
bold = Indicates the analyte was detected above MDL.
bold and shaded= Indicates the analyte was detected in excess of MCL.
J = Estimated Value.
U = Value Below MDL (value represents MDL).
L = Low Molecular Weight PAH (LPAH)
H = High Molecular Weight PAH (HPAH)
C = Carcinogenic PAH
ug/L = micrograms per liter
mg/L = milligrams per liter

TABLE 1 DEFINITIONS AND END NOTES

Definitions:

Groundwater Performance Goals = As described in the Second Five-Year Review (DEQ, September 2006), the EPA has determined that Alternate Concentration Limits (ACLs) are not valid as substitutes for Maximum Contaminant Levels (MCLs) in groundwater at this Site. Invalidation of ACLs at this Site also affects whether the groundwater remedial action objectives derived from the provisions in CERCLA for using ACLs remain valid for the Site (i.e., no exceedance of contaminant background concentrations in the Willamette River). The DEQ and EPA anticipate that: 1) groundwater standards for the Site will be established following a rigorous analysis of site conditions and all relevant data; and 2) (assuming MCLs cannot be met) the application of a waiver pursuant to Section 122(d)(4) of CERCLA for MCLs to comply with the threshold criterion (meeting ARARs) for all remedies implemented pursuant to any final CERCLA ROD.

ACLs = Alternate Concentration Limits.

MCLs = Primary Drinking Water Standard Maximum Contaminant Levels.

MRL= Method Reporting Limit. Reporting Level at, or above, the lowest standard of the Calibration Table.

MDL= Method Detection Limit. Reporting Level at, or above, the statistically derived limit based on 40CFR, part 136, Appendix B.

bold = Indicates the analyte was detected above MDLs.

italic-bold = Indicates the analyte was detected in excess of ACLs or MCLs.

Shaded = Indicates NAPL was historically present in well or during sampling.

ND = Not Detected; see detection limits of individual constituents.

J = Estimated Value.

U = Value Below MDL (value represents MDL).

WC = Willamette Cove well.

L = Low Molecular Weight PAH (LPAH)

H = High Molecular Weight PAH (HPAH)

C = Carcinogenic PAH

ug/L = micrograms per liter

mg/L = milligrams per liter

End Notes:

[1] Sample ID for laboratory is MW-Er.

[2] Qualified as not detected because analytes were detected in the method blank (values represent amount detected in sample).

[3] Samples were inadvertently left out of refrigerator by Test America; all sample results for PAH's + PCP must be considered estimates only.

[4] Sample ID for laboratory is EW-31r.

[5] Due to recoveries outside of method control limits in lab MS/MSD samples, results must be considered estimated levels only.

[6] Sample ID for laboratory is MW-Bs.

[7] Free Product in Sample.

[8] Sample ID for laboratory is MW-69i.

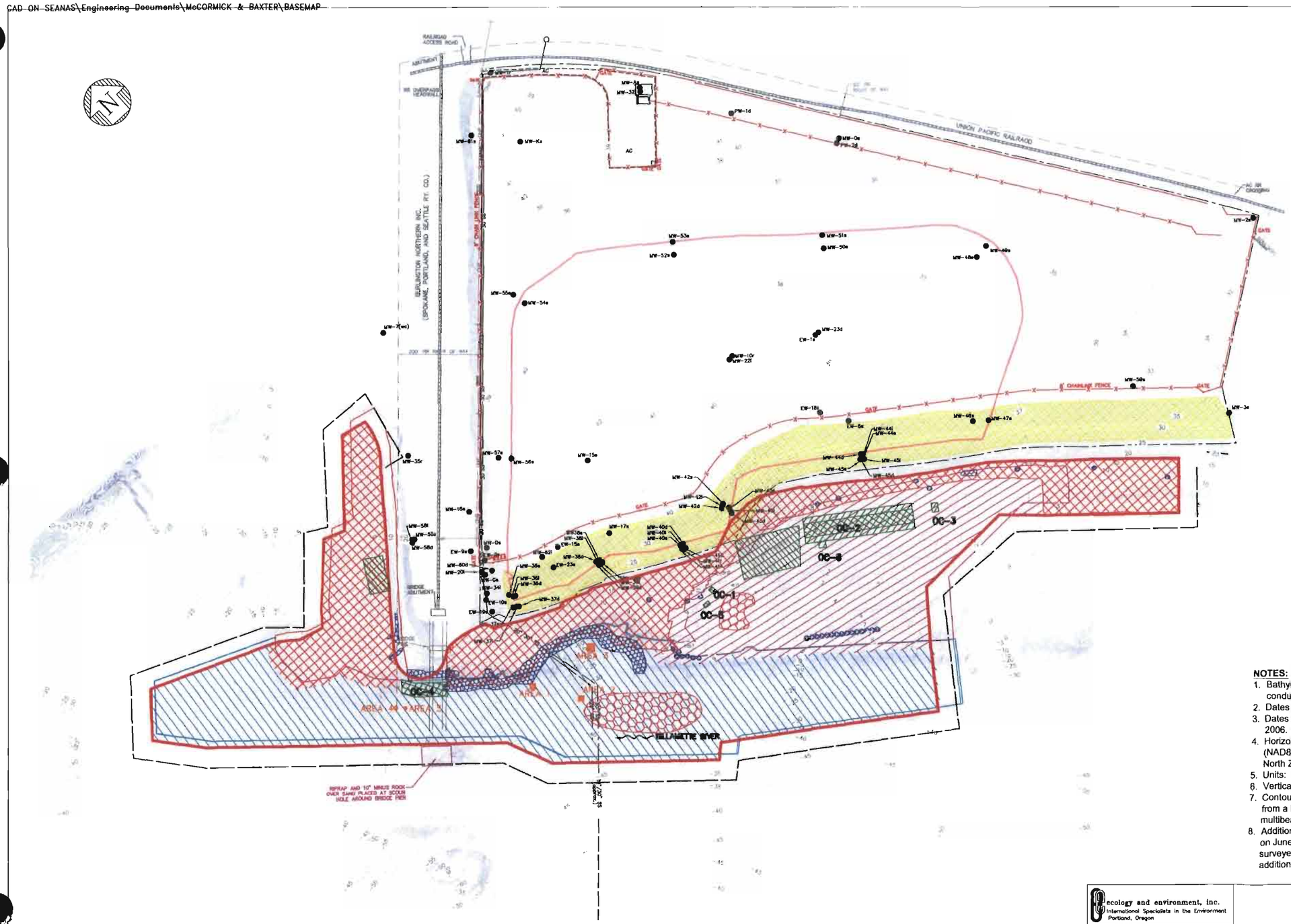
A

Laboratory Analytical Reports for Quarterly MW-59s Sampling

(Included only with the O&M Report CD)

Attachment I

CAD ON SEANAS\Engineering Documents\McCORMICK & BAXTER\BASEMAP



LEGEND:

- PROPERTY LINE
- DSL EASEMENT (#31530-EA)
- ELEVATION CONTOUR (FT. NAVD 88)
- SS — HIGH PRESSURE SEWER LINE
- STM — STORM SEWER
- FENCE
- GRAVEL ACCESS ROAD
- SUBSURFACE BARRIER WALL
- SEDIMENT CAP BOUNDARY
- BOULDER CLUSTERS/ROCK MOUND
- RIPRAP ARMOR
- OC-2 ORGANOCLAY MAT (DOUBLE LAYER)
- OC-1 ORGANOCLAY MAT (SINGLE LAYER)
- GRANULAR ORGANOCLAY
- HOT SPOT TREATMENT (THICKENED SAND LAYER)
- ARTICULATED CONCRETE BLOCK
- 6-INCH MINUS ROCK ARMOR
- 10-INCH MINUS ROCK ARMOR
- TURF REINFORCEMENT MAT PLACED OVER EARTHEN CAP
- ADDITIONAL 6-INCH MINUS ROCK PLACEMENT AREA (SEE NOTE 8 BELOW)

NOTES:

1. Bathymetric and Terrestrial Surveys conducted by David Evans and Associates, Inc. (DEA).
2. Dates of Bathymetric Survey: April 26, 2006 and October 8, 2007.
3. Dates of Terrestrial Survey: November 17, 2004, and January 24, 2006.
4. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
5. Units: International Feet.
6. Vertical Datum: North American Vertical Datum of 1988 (NAVD88)
7. Contour Interval: One-Foot. Bathymetric contours were derived from a Digital Terrain Model (DTM) based on a 3-foot grid of multibeam data.
8. Additional rock was placed at the 6" minus rock placement areas on June 26, 2007 and June 27, 2007. These areas have not been surveyed, and the contours on this figure do not reflect the additional rock placement.

SCALE IN FEET: 1"= 120'

0 120 240 360

1	4-9-08	GW	GP	ISSUED FOR ECO CAP REPAIR WORK
NO.	DATE	DRN	APP'D	DESCRIPTION

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY: C. NANCARROW
CHECKED BY:
DRAWN BY: C. NANCARROW
APPROVED BY: A. WHITMAN

DRAWING 2

SEDIMENT CAP FEATURES

Sitewide Record Drawings
McCormick & Baxter Superfund Site
Portland, Oregon

SCALE	DATE REVISED	C.A.D. FILE NO.
NOTED	02-29-08	SitewideDrawings_Ch03D.dwg

ecology and environment, inc.
International Specialists in the Environment

333 SW Fifth Avenue
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

RECEIVED
MAY 16 2008
Environmental
Cleanup Office

May 14, 2008

Mr. Scott Manzano
Project Officer
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

Re: 2007 O&M Report, McCormick and Baxter Site
Task Order No. 71-03-28

Dear Scott:

Ecology and Environment, Inc. (E & E) hereby submits the enclosed Operation and Maintenance Report (January 2007 through December 2007). Electronic files include one CD containing the report text and graphics in Adobe pdf format, as well as selected data tables in Microsoft Excel format, and one DVD containing diver video. The video can be viewed using Intervideo WinDVD.

If you have any questions or comments, please call me at 503/248-5600 or contact me via e-mail at ewhite@ene.com.

Sincerely,

ECOLOGY AND ENVIRONMENT, INC.

Eric A. White

Eric White, P.E.
Task Order Manager

cc: John Montgomery, Program Manager, E & E
with report: Steve Campbell, Contract Officer, DEQ
Heidi Blischke, GSI
Rick Ernst, Hart Crowser
Nancy Harney, U.S. Environmental Protection Agency
Rene Fuentes, U.S. Environmental Protection Agency
with discs: Gayle Garman
Rob Neely, NOAA
Cy Young, Oregon Department of State Lands
Jennifer Peers, Stratus Consulting
Sheila Fleming, Ridolfi