



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
**REGION 10**  
1200 Sixth Avenue  
Seattle, WA 98101

**ACTION MEMORANDUM**

**DATE:** May 3, 2006

**SUBJECT:** Action Memorandum for a Non-Time-Critical Removal Action at the Slip 4 Early Action Area of the Lower Duwamish Waterway Superfund Site, Seattle, Washington

**FROM:** Karen Keeley *KK*  
Superfund Project Manager

**TO:** Daniel D. Opalski, Director  
Office of Environmental Cleanup

**THRU:** Chris D. Field, Unit Manager *CD*  
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Charles Ordine, Assistant Regional Counsel *CO for CO*  
Office of Regional Counsel

**Site ID:** CERCLIS ID - WA0002329803

**I. PURPOSE**

The purpose of this Action Memorandum is to document the U.S. Environmental Protection Agency's (EPA) approval of the non-time-critical removal action described herein for the Slip 4 Early Action Area of the Lower Duwamish Waterway (LDW) Superfund Site, Seattle, King County, Washington (Figure 1). The removal action for contaminated marine sediments and immediately adjacent bank areas at the Slip 4 Early Action Area (the "Slip 4 EAA" or "the site") will be conducted by the City of Seattle and King County pursuant to an EPA Settlement Agreement. The scope of the removal action addresses approximately 3.6 acres of sediments and banks (Figure 2).

Within the Slip 4 EAA, the chemical of concern (CoC) in the contaminated sediments is polychlorinated biphenyls (PCBs). Contaminated sediments with the highest PCB concentrations will be removed through dredging and excavation, and remaining sediments, which have lower concentrations, will be capped. Contaminated sediments and soils from adjacent bank areas along the eastern portion of the slip will be excavated, and these bank areas will be sloped to accommodate placement of engineered slope caps. Removed sediments and soils from bank areas will be disposed at an off-site upland commercial disposal facility. Asphalt, creosote-treated timbers and piles, and other debris present in sediments will be removed, as necessary, for implementation of the removal action. Substantial sediment accumulations that extend from Slip 4 up into the lowest outfall segment of the Georgetown flume will be removed or otherwise contained to eliminate the potential for recontamination of sediments in Slip 4.

The primary removal action objective for sediments in the Slip 4 EAA is to reduce the concentrations of contaminants in post-cleanup surface sediments [biologically active zone (0-10 cm)] to below the Washington State Sediment Quality Standards (SQS) for PCBs and other chemicals of interest.

By approval of this memorandum, EPA Region 10 determines that: 1) the conditions at the site may present an imminent and substantial endangerment to public health, or welfare, or the environment; and 2) the site conditions meet the criteria of the National Contingency Plan (NCP), 40 CFR Section 300.415, for a removal action. The removal action is required for immediate reduction of the risk to the public and the environment from uncontrolled hazardous substances at the Slip 4 EAA. An administrative record has been prepared for this removal action. No obligation of funds is necessary as this action will be conducted by the City of Seattle and King County under an EPA Settlement Agreement.

## **II. SITE CONDITIONS AND BACKGROUND**

### **A. Site Description**

This is a non-time-critical removal action at the Slip 4 EAA within the boundaries of the LDW Superfund Site in Seattle, WA (see Figure 1). The Slip 4 EAA has been identified by the EPA and the Washington State Department of Ecology (Ecology) as a candidate area for early cleanup because sediments in these areas are associated with greater ecological and/or human health risk. The LDW Site was listed on the National Priorities List (NPL), pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Section 9605, on September 13, 2001. The CERCLIS ID number is WA0002329803.

The key parties involved in the LDW Site are the Lower Duwamish Waterway Group (LDWG) (composed of the City of Seattle, King County, the Port of Seattle, and The Boeing Company), EPA, and Ecology. The LDWG is conducting the LDW Remedial Investigation and Feasibility Study under an Administrative Order on Consent (AOC) with EPA and Ecology. Pursuant to the LDWG AOC and Tasks 9 and 10 of the Statement of Work, and under EPA and Ecology oversight, the City of Seattle and King County performed the site characterization, environmental investigations, and the Engineering Evaluation/Cost Analysis (EE/CA) for the Slip 4 EAA.

## **1. Removal Site Evaluation**

Slip 4 is located on the east bank of the LDW, approximately 2.8 miles from the southern end of Harbor Island. Slip 4 was created in the early 1900s during filling and channelization of the Duwamish River. The slip itself is an arc-shaped remnant of a former Duwamish River meander. The slip encompasses approximately 6.4 acres and is approximately 1,400 feet long, with an average width of 200 feet. The slip is relatively shallow, ranging from +5 ft mean lower low water (MLLW) at the head of the slip to approximately -20 feet MLLW at the mouth. Properties immediately adjacent to Slip 4 are currently owned by Crowley Marine Services (Crowley), First South Properties, King County, and The Boeing Company. Crowley owns the majority of the submerged land (i.e., sediments) within the Slip 4 EAA and the bank along the First South Properties' shoreline.

Since its creation, aquatic land uses in Slip 4 have included log storage and shipping activity. Beginning in approximately the 1930s, land uses along the slip included a sawmill, lumber yard, hydraulic equipment manufacturing, machine shop, lime plant, and asphalt plant. Airplane manufacturing adjacent to Slip 4 began sometime before 1960. Current land uses include a pier and berthing facility used for cargo, shipping and other navigational activities; adjacent upland property occupied by Emerald Services for storage of portable toilets, storage tanks and containers, and dumpsters; and, adjacent upland property owned by Boeing that houses the Integrated Aircraft Systems Laboratory, as well as a public walking trail and park.

Slip 4 receives stormwater from five public outfalls that discharge to the head of Slip 4, and from numerous private storm drains and a swale located along the Slip 4 shoreline (see Figure 2). The drainage basin that discharges to Slip 4 currently covers about 467 acres. Within the basin, land use is primarily industrial/commercial, with a small amount of residential property. There are currently no direct industrial discharges to Slip 4. Non-point discharges to Slip 4 include stormwater runoff that is not collected in a piped system and discharges directly to the slip as sheet flow.

Numerous historical environmental investigations of sediments in Slip 4 have been performed. Four sediment investigations were conducted between 1990 and 1999. Additional

sediment and bank soil characterization data were collected in 2004 and 2005. Previous upland investigations adjacent to Slip 4 have included soil and groundwater investigations. Based on these studies, the primary contaminant of concern in sediments in Slip 4 is PCBs. These investigations and results are described in detail in the EE/CA and in subsequent sections of this Action Memorandum.

Historical sources of releases of PCBs to the Slip 4 sediments include commercial and industrial releases. Potential sources include a Seattle City Light facility that discharged stormwater runoff and cooling water to Slip 4 via the Georgetown Steam Plant flume; The Boeing Company Plant 2 area immediately adjacent to Slip 4, the North Boeing Field, and the King County International Airport (a/k/a Boeing Field) that discharged stormwater runoff and industrial wastewater to the slip via storm drains; and erosion of contaminated soils from banks along Slip 4.

These past releases are the primary source of contaminants in Slip 4 sediments that are subject to this removal action. However, ongoing releases of PCBs to Slip 4 from stormwater drainage have been identified, and these releases pose a recontamination pathway of potential concern. The sources of these PCB releases continue to be investigated and EPA will ensure that these sources are adequately controlled prior to construction of the Slip 4 removal action to minimize the potential for recontamination of Slip 4 sediments.

## **2. Physical Location**

The Slip 4 EAA is on the east bank of the Duwamish River, south of downtown Seattle, Washington. Slip 4 is located in a primarily industrial and commercial area; a small residential neighborhood is located about 0.25 mile from the slip. There is a small park on the southeastern side of Slip 4. Slip 4 is currently used for navigation, with tugs and barges operating and docking along the middle and outer berths in Slip 4. Possible recreational activities within and near the slip include kayaking, canoeing, and motor boating. Commercial and tribal fishing occur within and near the Duwamish River. The Muckleshoot Tribe has federally recognized treaty rights in the vicinity of Slip 4. Tribal Usual and Accustomed fishing areas recognize commercial, subsistence, and ceremonial tribal fishing rights.

Nearly all of the Slip 4 shoreline has been highly modified and includes berths and a pier, riprap, exposed geotextile material, bulkheads, and miscellaneous fill. The small areas of unarmored shoreline are generally steep, eroded slopes, vegetated by mixed grasses and shrubs.

## **3. Site Characteristics**

The removal action addresses contaminated estuarine sediments within the Slip 4 EAA, as well as adjoining banks that are potential sources of PCB contamination to the sediments. The

boundaries of the removal action are shown in Figure 2. During design, some adjustments may be made to the boundary based on predesign sampling results. Contaminants detected, concentrations, sediment quality guidelines, and site conditions are described below, and site exposure and associated risk are described in Section III.

#### **4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant**

The portion of Slip 4 that will be addressed by the removal action primarily consists of approximately 3.6 acres of contaminated estuarine sediments. The contaminant of concern is PCBs. This contaminant is a “hazardous substances” as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

In the Slip 4 EAA, the 2004 sediment investigations show PCB concentrations in surface sediments ranging from 0.2 parts per million dry weight (ppm dw) to 5.1 ppm dw, and in subsurface sediments ranging from undetected to 17 ppm dw (excludes one outlier). The 2004 PCB concentrations in surface sediments in most areas of the slip are less than they were for data collected between 1990 and 1998. These decreasing PCB concentrations in surface sediments over time and throughout the slip may be the result of reduced PCB input due to source control, and physical processes consistent with natural recovery of sediments within Slip 4.

Actions to address PCBs will also address the other contaminants found in sediments at some stations in the Slip 4 EAA. The other contaminants that exceed promulgated standards are bis(2-ethylhexyl)phthalate, phenol, and indeno(1,2,3-c,d) pyrene. Concentrations and analysis of contaminants in the Slip 4 sediments are described in the EE/CA. The primary sources of these contaminants are from upland facilities and uses that released the substances into the river. Based on current upland source control efforts, significant upland sources have been controlled or will be by the time the removal action is completed.

The presence of hazardous substances at the site, or the past, present, or potential migration of hazardous substances currently located at or emanating from the site, constitute actual and/or threatened “releases” as defined in Section 101(22) of CERCLA, 42 U.S.C. § 9601(22). Section III of this Action Memorandum provides a discussion of potential exposure and risk to site receptors.

#### **5. NPL status**

The Slip 4 EAA is located within the boundaries of the Lower Duwamish Waterway Superfund site, which was listed on the NPL on September 13, 2001.

## **6. Maps, pictures, and other graphic representations**

Relevant figures are attached to this memorandum.

### **B. Other Actions**

#### **1. Previous actions**

There have been no previous CERCLA removal actions or sediment cleanup activities in Slip 4. However, sediments in the slip have been dredged for navigation purposes. Dredging events are known to have occurred in 1981 and 1996 when sediments on the west side of the slip were removed (see Section 2.1.2 of the EE/CA). The 1981 dredging event included dredging of sediments from within a portion of the area now designated as the Slip 4 EAA.

#### **2. Current actions**

There are no other removal actions associated with the Slip 4 EAA.

As the lead agency for LDW source control, Ecology is currently performing upland source control work under state authorities. Consistent with the Source Control Strategy for the LDW Site, Ecology issued a draft Source Control Action Plan for the Slip 4 EAA on April 6, 2006. The Action Plan is currently being revised in response to public comment.

Potential sources of post-removal recontamination have been considered during the EE/CA evaluation of alternatives. Potentially significant upland sources of recontamination, particularly for PCBs, identified for Slip 4 are continued erosion of bank material and contaminant loading from storm drains. Because some bank material is a potential source of recontamination to Slip 4 sediments, actions to stabilize and contain these banks are included as part of this removal action. No Ecology-led upland cleanup actions are currently planned in association with source control actions related to the Slip 4 EAA. Contaminant loading from storm drains is being addressed through source control actions that are currently being implemented (e.g., drain cleaning, source tracing) and will continue, along with further investigation and monitoring. Sediment cleanup will not be implemented until adequate source control efforts have been implemented to minimize the potential for sediment recontamination.

### **C. State and Local Authorities**

#### **1. State and local actions to date**

The LDW is a joint-lead site with Ecology. The LDW RI/FS is currently being prepared.

Ecology has participated in reviewing and commenting on all documents, briefings, and public meetings associated with the Slip 4 removal action. Other stakeholders that were provided an opportunity to participate included the Duwamish River Cleanup Coalition, Waste Action Project, Muckleshoot Tribe, Suquamish Tribe, Washington State (Department of Ecology as trustee), Washington Department of Fish and Wildlife, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, and Washington Department of Health.

## **2. Potential for continued State/local response**

The removal action at the Slip 4 EAA will be conducted by the City of Seattle and King County under CERCLA authority, with the state being given the opportunity to provide timely comments on project design documents and work plans. Coordination efforts with state and local authorities will continue throughout the project.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

Consistent with EPA guidance for conducting an EE/CA, a streamlined risk evaluation was conducted for the Slip 4 EAA (Section 2.4 of the EE/CA). The streamlined risk evaluation addresses risk only from exposure to contaminated sediments in the absence of a removal action.

Areas in the LDW outside of the Slip 4 removal action boundary will continue to be evaluated under the LDW RI/FS. The LDW RI/FS will include a baseline ecological and human health risk assessment to evaluate potential risks to human health and the environment posed by contaminated sediments throughout the entire LDW Site.

#### **A. Threats to Public Health or Welfare**

At the Slip 4 EAA, potential exposure pathways for human health risks include direct contact with sediment during netfishing or beach play and ingestion of fish or shellfish that are in contact with sediment or that have fed on prey that reside within the sediment. The contaminant of concern for Slip 4 sediments is PCBs. PCBs are a known human carcinogen and are also known to accumulate in the tissue of fish and shellfish.

Human health risks specific to PCBs in sediments in the Slip 4 EAA have not been calculated; however, risks to human health from sediments were evaluated in the context of the results from the overall LDW Site via the Phase 1 Human Health Risk Assessment (see Section 2.4.2.2 of the EE/CA). Specifically, sediment concentrations were compared to human health risk-based screening concentrations protective of direct sediment contact for individuals engaged in netfishing or beach play activities. Results indicate that PCBs are the primary risk driver for

these two exposure pathways in Slip 4. Only two other chemicals (arsenic and lead) exceed the risk-based screening concentrations, and each of these is exceeded at only one station. Also, PCBs found in Slip 4 sediments likely contribute to potential unacceptable risks throughout the LDW to humans through ingestion of contaminated fish or shellfish.

Based on the concentrations detected in sediments at the site and the potential direct and indirect exposure pathways identified, EPA has determined that a removal action is required to mitigate impacts to public health, or welfare, or the environment. The removal action will eliminate the exposure pathways to PCBs in sediments within the removal area, which will lower unacceptable risks to human users of Slip 4 and site-wide excess risks to users of the entire site for seafood collection.

## **B. Threats to the Environment**

Ecological receptors include benthic organisms, fish, birds, and mammals. Potential exposure pathways for benthic organisms include direct contact with contaminated sediment, and ingestion of contaminated sediment. The primary potential exposure pathway for fish, birds, and mammals is ingestion of marine organisms. Bottomfish may have additional exposure due to direct contact with or ingestion of contaminated sediment. PCBs are known to adversely affect aquatic biota.

Ecological risk to benthic communities in Slip 4 was evaluated through comparison with the Washington State Sediment Management Standard (SMS) numerical chemical concentration criteria. The SMS numerical criteria are considered protective of benthic organisms and are comprised of the sediment quality standard (SQS) and the cleanup screening level (CSL). Concentrations of contaminants equal to or less than the SQS are unlikely to have adverse effects on biological resources in Puget Sound marine sediments. An exceedance of the SQS numerical criteria indicates the potential for minor adverse biological effects or toxicity. The CSL is greater than or equal to the SQS and represents a higher likelihood of risk to benthic organisms than SQS levels. For total PCBs, the SQS is 12 ppm-carbon normalized and the CSL is 65 ppm-carbon normalized.

Surface (0-10 cm) sediment chemistry data from Slip 4 were used to estimate risks to benthic infauna. In 2004, PCB concentrations exceeded the CSL at three of 29 sample locations and in the intertidal composite sample. Total PCB concentrations at these three sample locations ranged from 103 to 148 ppm-carbon normalized, and the intertidal composite sample showed 154 ppm-carbon normalized. On a dry-weight basis, these concentrations range from 1.7 to 5.1 ppm. PCB concentrations at six additional sampling locations exceeded the SQS. The only other detected chemicals that exceeded the SQS or CSL in the 2004 surface samples were BEHP, phenol, and indeno[1,2,3-c,d]pyrene. CSL exceedances of these three chemicals are included within the removal area. Thus, surface sediments within the removal area exceed SMS



standards, indicating that these sediments may pose a risk to benthic community health if no cleanup action is taken.

Risks to other potential ecological receptors in Slip 4 were not quantitatively evaluated; however, birds, fish, and mammals are mobile and could be exposed to chemicals in sediment throughout the LDW, including Slip 4.

Threatened and endangered species potentially occurring within the local area include Chinook salmon, bull trout, and bald eagle.

Based on the PCB concentrations detected in sediments at the site (and exceedances of the SMS), and known or potential ecological pathways identified, EPA has determined that a removal action is required to reduce potential impacts to the environment.

#### **IV. ENDANGERMENT DETERMINATION**

Actual or threatened releases of hazardous substances from this site may present an imminent and substantial endangerment to public health, or welfare, or the environment.

#### **V. PROPOSED ACTIONS AND ESTIMATED COSTS**

##### **A. Proposed Actions**

This non-time-critical removal action at the Slip 4 EAA will be implemented by the City of Seattle and King County. In general, the contaminated sediment with the highest PCB concentrations will be removed, and remaining sediments, which have lower concentrations, will be capped. Through an evaluation of effectiveness, implementability, and costs, the proposed action (Alternative 2 in the EE/CA) was selected as the preferred alternative. The selection of this alternative was not revised in response to public comment.

##### **1. Proposed action description**

The proposed actions include a combination of excavating, dredging, and capping of sediments in the slip and in immediately adjacent bank areas; institutional controls; and long-term monitoring to achieve the objectives of the removal action within the approximately 3.6 acre Slip 4 Early Action Area (Figure 3). The actions include:

- Removal of contaminated sediments with disposal at an off-site upland commercial disposal facility, followed by capping of remaining sediments, as detailed below:

- Dredge approximately 4,300 cy of contaminated sediment from the Slip 4 EAA (as shown in Figures 5-6 through 5-9 of the EE/CA). This dredging generally targets the near-surface material with the highest concentrations of contaminants.
- Excavate approximately 9,700 cy of bank material along the shore of the Slip 4 (in Zones 2, 3, 4, and 5 as shown in Figure 2; bank material is estimated to consist of approximately 6,800 cy sediment and 2,900 cy soil). Excavations in Zones 2 and 3 (covering approximately 250 feet of shoreline) will be extended landward to expand intertidal habitat, creating a shallower slope and approximately 0.08 acres of new aquatic habitat from existing uplands.
- Place engineered sediment caps throughout the entire 3.6 acre removal action area to physically and chemically isolate contaminated sediments not removed by dredging or excavation (as shown in Figures 5-6 through 5-9 of the EE/CA). Specific cap configurations will be determined during design, in consideration of federal guidance, protection of Native American shellfishing treaty rights, and habitat type and functions. All dredged or excavated areas will be capped.
- Place engineered slope caps on the eastern shore of Slip 4 (Zones 3, 4, and 5 as shown in Figure 2). Improve conditions of bank areas in preparation for capping (including improving slope stability, removing debris and failing bulkheads, and preparing a subgrade for cap placement). Post-removal samples would be collected on exposed surfaces to document the nature of the material beneath the cap. It is possible that the action would remove all contaminated material, in which case the final cap may require a lesser degree of long-term monitoring and maintenance. Place slope cover in Zone 2 for slope stabilization (based on existing data, potential contaminant source materials have not been identified in Zone 2).
- Dispose of excavated and dredged material in a landfill that meets state and federal requirements for disposal of such materials.
- To accommodate these actions, the City of Seattle will proceed with negotiations for a purchase and sale agreement with Crowley Maritime for the land owned by Crowley and subject to this action. The negotiations may include a lot line adjustment in the under-pier area so that no capped areas would remain in Crowley's ownership.
- To accommodate these actions, a portion of the existing Crowley pier may be removed from within the removal action area. During project design, the City of Seattle and King County will evaluate the most feasible approach to remediate the

under-pier area and to implement long-term maintenance of that remedy. The evaluation will include consideration of effectiveness, implementability, cost, and habitat functions.

- Removal of asphalt, creosote-treated timbers and piles, and other debris present in sediments within the removal action area (estimated 500 tons).
- Sediment accumulations currently present within the lowest segment of the Georgetown flume (approximately 370 feet of the flume upgradient from the outfall itself) will be assessed during predesign investigations. Accumulated sediments that have the potential to recontaminate Slip 4 will be removed either as part of this removal action or as a separate action by the City of Seattle. Modifications or upgrades to the Georgetown flume outfall structure may also be necessary as part of this removal action to ensure proper function of the outfall structure (i.e., free-draining at a low tide), since it is currently at a lower elevation than the sediments immediately adjacent to the outfall. Alternatives include designing the cap to accommodate the existing outfall structure, raising the elevation of the outfall structure, and abandoning the outfall structure.
- Implementation of institutional controls.
  - Institutional controls will be required because some hazardous substances will remain on-site at levels that do not allow unlimited use and unrestricted exposure in bank slopes and intertidal and subtidal sediment areas. An Institutional Control Implementation Plan and a final Institutional Control Implementation Report will be prepared. The specific objectives of the institutional controls are to:
    - Prevent any uncontrolled excavation or construction that may compromise the cap integrity;
    - Prevent any current or future land and waterway uses that could compromise the cap integrity;
    - Require notification of the state and EPA prior to development actions at the site that may damage the cap;
    - Ensure that these restrictions will run with the land.
  - Institutional controls will not preclude the Muckleshoot Tribe from exercising treaty-protected fishing activities in the removal action area in the future.
- Performance of long-term monitoring and reporting.
  - Long-term monitoring and reporting will be performed. The primary purpose of this monitoring is to ensure that the site remains protective of human health and

the environment. A Long-Term Monitoring and Reporting Plan will be developed to specify monitoring activities and frequencies of monitoring events, the responsible party for performing each activity, and the process to be followed for addressing any contingency or corrective actions.

## **2. Contribution to remedial performance**

The Slip 4 EAA is located within the boundaries of the LDW Superfund Site. The LDW Record of Decision is expected after the completion of the Slip 4 non-time-critical removal action. Due to the number of years remaining to select and implement a remedy river-wide, this removal action is designed to immediately address contaminated sediments within the Slip 4 EAA, and reduce exposure to receptors to concentrations of chemicals that likely would require response action under any future remedial alternative. This removal action will contribute to the efficient performance of the anticipated long-term remedial action for the LDW Site with respect to the release concerned.

## **3. Description of alternative technologies**

Candidate technologies for sediment remediation were identified and screened prior to developing alternatives for further engineering analysis. General categories of removal action technologies considered at the screening stage included: no action, institutional controls, monitored natural recovery and enhanced natural recovery (MNR/ENR), removal, containment, treatment, and disposal. Each of these candidate technologies were evaluated based on effectiveness, implementability, and cost. Technologies were eliminated from further consideration due to low expected technical feasibility or effectiveness. Technologies that were not cost-effective relative to other equally-protective options were also not retained. Technologies determined to be potentially applicable to the Slip 4 removal action included institutional controls, MNR/ENR, removal, containment, and disposal.

## **4. Engineering Evaluation/Cost Analysis (EE/CA)**

EPA prepared an EE/CA Approval Memorandum (June 15, 2004) for this removal action.

Under EPA oversight, the City of Seattle and King County prepared the EE/CA, which documents the development and evaluation of removal action alternatives and discusses the rationale for the recommended alternative. The EE/CA was finalized on February 10, 2006, and a copy of the Executive Summary of the EE/CA is provided in Attachment A. A 30-day public comment period on the EE/CA was held, and EPA prepared a response to public comments (Attachment B).

## **5. Applicable or relevant and appropriate requirements (ARARs)**

For on-site activities, all state and federal ARARs will be complied with to the extent practicable. A comprehensive list of ARARs for the removal action is provided in Table 6-1 of the EE/CA and reproduced herein in Attachment C. Primary federal ARARs for the removal are the Clean Water Act Sections 401 and 404; Endangered Species Act; and Section 10 of the Rivers and Harbors Act. Primary state ARARs are the Washington State Sediment Management Standards and the Washington Hydraulics Code.

EPA is preparing a Biological Assessment that evaluates the potential effects on threatened and endangered species from this removal action. EPA will consult with NOAA Fisheries and the U.S. Fish and Wildlife Service.

EPA prepared an evaluation of Essential Fish Habitat (EFH) and concluded that this proposed action is not likely to adversely affect EFH for salmonid and groundfish. A copy of EPA's evaluation was provided to NOAA Fisheries.

Off-site activities will comply with all applicable local, state, and federal laws, including the Off-Site Disposal Rule (40 CFR 300.440).

## **6. Project schedule**

The project schedule for the Slip 4 EAA will be set forth in the EPA Settlement Agreement Statement of Work for this removal action. The construction phase of this project is currently scheduled for October 2007 through February or March 2008.

### **B. Estimated Costs**

The removal action is being implemented by the City of Seattle and King County. The projected costs to implement this non-time-critical removal action are estimated at \$6.9 million (see Table 5-3 of the EE/CA).

## **VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

If the action is delayed or not taken, contamination will continue to adversely affect the environment at levels exceeding probable effect concentrations. Delayed action will increase environmental risks through prolonged exposure to contaminants present in the sediments.

## **VII. OUTSTANDING POLICY ISSUES**

There are no outstanding policy issues at this site.

## **VIII. COMMUNITY RELATIONS**

The EE/CA for this removal action was available for public review and comment from February 17 through March 18, 2006. Notice of this comment period was published in the *Seattle Times* and *El Mundo* at the start of the 30-day public comment period. Notice of this public comment period was also announced in the February 24, 2006 edition of the Washington Department of Ecology's *Site Register* and by postcards in English and Spanish. Notice of the comment period, public meeting, and a summary of the proposed EE/CA alternatives were described in a Slip 4 Fact Sheet (February 2006) that was mailed to approximately 950 addresses. Fact sheets in Spanish (about 400) were also distributed. Announcements were also placed on EPA's website and the EPA web calendar. Public outreach was also performed by the Duwamish River Cleanup Coalition, EPA's Community Advisory Group for the site.

EPA held a public meeting in the Georgetown neighborhood on March 7, 2006. The meeting was attended by approximately 120 people. Public comments were recorded by a court reporter.

EPA received eight comment letters and comment forms during the public comment period, and fourteen individuals provided spoken comment at the public meeting. Responses to all significant comments are provided in the Responsiveness Summary (Attachment B).

An Administrative Record was prepared for this action and notice of availability of that record was published in the above-referenced newspapers and the Superfund Fact Sheet. The Administrative Record was available at EPA, and copies of key documents were made available at the Georgetown information repository, on the EPA web site for the Lower Duwamish Waterway, and via CD-ROM.

Since the initiation of the Slip 4 early action in 2003, EPA has provided stakeholders with the opportunity to review and provide input on all draft documents for the Slip 4 EAA and has held milestone briefings with stakeholders at key points in the process. EPA also participated in routine quarterly meetings with the Duwamish River Cleanup Coalition and other stakeholders to provide updates on site-wide LDW activities, including the Slip 4 EAA.

## **IX. ENFORCEMENT**

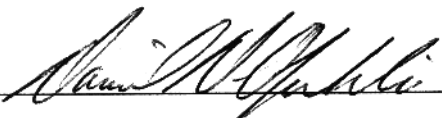
This removal action should be implemented by the City of Seattle and King County, pursuant to an Administrative Settlement Agreement and Order on Consent for Removal Action

(Settlement Agreement). The Settlement Agreement is currently being negotiated. The Settlement Agreement describes the work to be performed for the removal action, including preparation and submittal of project design and removal action documents, implementation of the removal action, submittal of a Removal Action Completion Report and Institutional Control Implementation Report, and submittal of a Long-Term Monitoring and Reporting Plan to ensure that the removal action objectives are achieved at the site.

## **X. RECOMMENDATION**

This decision document represents the selected removal action for the Slip 4 EAA, located within the boundaries of the Lower Duwamish Waterway Superfund Site, Seattle, Washington, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the site.

Conditions at the site meet the NCP Section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action. None of the removal project costs come from the Regional Removal allowance. Your approval or disapproval should be indicated below.

Approve: 

Date: 5-5-2006

Disapprove: \_\_\_\_\_

Date: \_\_\_\_\_

## **List of Figures and Attachments**

### **Figures**

Figure 1	Vicinity Map (Figure 1-1 from the EE/CA)
Figure 2	Slip 4 Removal Boundary (Figure 2-18 from the EE/CA)
Figure 3	Selected Alternative - Alternative 2 from the EE/CA (Figure 5-6 from the EE/CA)

### **Attachments**

Attachment A	Executive Summary for the Engineering Evaluation/Cost Analysis, Slip 4 Early Action Area
Attachment B	Responsiveness Summary for Public Comments on the Engineering Evaluation/Cost Analysis, Slip 4 Removal Action
Attachment C	ARARs (Table 6-1 from the EE/CA)



## Figures

**Attachment A**

**Executive Summary**

**Engineering Evaluation/Cost Analysis**

**Slip 4 Early Action Area**

**Lower Duwamish Waterway Superfund Site, Seattle, WA**

**Attachment C**

**ARARs, Table 6-1**

**Engineering Evaluation/Cost Analysis**

**Slip 4 Early Action Area**

**Lower Duwamish Waterway Superfund Site, Seattle, WA**