



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

OCT 14 2003

TO ALL INTERESTED GOVERNMENT AGENCIES AND PUBLIC GROUPS:

Under the National Environmental Policy Act, an environmental assessment (EA) has been performed on the following action:

TITLE: Duwamish/Diagonal Sediment Remediation Project

LOCATION: Elliott Bay/Duwamish River, City of Seattle, Washington

SUMMARY: The Elliott Bay/Duwamish Restoration Program (Program) Panel has completed an Environmental Assessment (EA) to restore natural resources injured by pollution in Elliott Bay, Seattle, Washington. The Program is administered by a cooperative intergovernmental Panel established to implement the requirements of a consent decree.

The project, called Duwamish/Diagonal Sediment Remediation Project, is located in the Duwamish Waterway just offshore of the Duwamish/Diagonal Combined Sewer Overflow (CSO) in the City of Tukwila. The project action will remove a layer of contaminated sediments over a seven-acre intertidal area in the Duwamish Waterway and install an engineered isolating sediment cap. The proposed cap will maintain existing water depths and river bottom elevations.

The public and other interested parties have participated in public meetings during the permitting process. The environmental review process has led us to conclude that these restoration actions will not have a significant effect on the human environment. Consequently, the National Oceanic and Atmospheric Administration issues a Finding of No Significant Impact (FONSI).

RESPONSIBLE OFFICIAL: William T. Hogarth, Ph.D
Assistant Administrator for Fisheries
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, Maryland 20910
301-713-2239

Therefore, an environmental impact statement will not be prepared. A copy of the Finding of No Significant Impact including the supporting EA is available upon request to the responsible official.

Sincerely,

Joyce M. Wood
NEPA Coordinator



**FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT
FOR THE DUWAMISH/DIAGONAL SEDIMENT REMEDIATION PROJECT
SEATTLE, WASHINGTON**

The National Oceanic and Atmospheric Administration (NOAA) is the lead Federal agency for the National Environmental Policy Act (NEPA) compliance for the Duwamish/Diagonal Sediment Remediation Project, Green/Duwamish River System, Seattle, Washington. This project is sponsored by the Elliott Bay/Duwamish Restoration Program Panel (EB/DRP or Program), an intergovernmental program established under a consent decree to help restore natural resources injured by pollution in Elliott Bay and the Lower Duwamish River, Seattle, Washington.

The Duwamish/Diagonal project will remove a layer of contaminated sediments over a seven-acre intertidal area just offshore of the Duwamish/Diagonal Combined Sewer Overflow in the Duwamish Waterway and install an engineered isolating sediment cap. The proposed cap will maintain existing water depths and river bottom elevations. Along with the other projects under the Program, this project was designed to benefit fish that occur in the Duwamish River. The public and other interested parties have participated in public meetings during the permitting process.

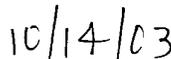
The project will be constructed in compliance with all permits required by the State and Federal regulatory agencies. The Biological Assessment for the project, and the informal consultations (National Marine Fisheries Service and the U.S. Fish and Wildlife Service addressing Endangered Species Act and Essential Fish Habitat) for the Duwamish/Diagonal Sediment Remediation Project are part of the Administrative Record for this project. The proposed activities were evaluated under the goals and objectives and other evaluation criteria specified by the National Environmental Policy Act (40 CFR 1508.27). Based on a review of all these factors and the referenced documents, NOAA and the Trustees concluded that the proposed activities would not have a significant effect on the quality of the human environment. NOAA has independently reviewed the permitting and other regulatory documents in the Administrative Record and determined that they adequately evaluate and mitigate as needed any potentially significant impacts to the human environment associated with the Duwamish River, Washington Remediation Project.

DETERMINATION:

Based on an environmental review and evaluation of the Environmental Assessment for the Duwamish/Diagonal Sediment Remediation Project, I have determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of Section 102 (2)c of the National Environmental Policy Act of 1969, as amended. Accordingly, an environmental impact statement is not required for this project.



fu _____
William T. Hogarth, Ph.D.
Assistant Administrator for Fisheries
National Marine Fisheries Service
National Oceanic and Atmospheric Administration



Date

**ENVIRONMENTAL ASSESSMENT
DUWAMISH/DIAGONAL SEDIMENT REMEDIATION PROJECT**

LEAD FEDERAL AGENCY FOR EA: National Oceanic and Atmospheric Administration

COOPERATING AGENCY FOR EA: U.S. Fish and Wildlife Service (U.S. Dept. Interior)

PROJECT MANAGER and
STATE SEPA COMPLIANCE: King County Department of Natural
Resources and Parks

PARTICIPATING AGENCIES/TRIBES: Elliott Bay/Duwamish Restoration Program Panel
(U.S. Department of the Interior, State of
Washington, Muckleshoot Indian Tribe, Suquamish
Tribe, City of Seattle, King County)

ABSTRACT: This Environmental Assessment has been prepared for the
Duwamish/Diagonal Sediment Remediation Project to address restoration
of natural resources in accordance with a Consent Decree.

This project proposes to achieve the State of Washington Sediment
Management Standards on a seven-acre site in the Duwamish Waterway
by removing a layer of contaminated sediment and installing an
engineered isolating sediment cap. The proposed cap will maintain
existing water depths and river bottom elevations. The contaminated
sediment to be removed has concentrations that exceed the State
Sediment Quality Standards values for PCBs, mercury, bis (2-ethylhexyl)
phthalate, and butyl benzyl phthalate. The approximately 66,000 cubic
yards of sediment to be removed will be transferred to an authorized
upland or in-water disposal site dependent on EPA's approval. The
capping material will be obtained from the U.S. Army Corps of Engineers
dredging operations or another source of clean material.

ADMINISTRATIVE RECORD
and CONTACT PERSON:

Copies of the Final EA are available at
the address listed below or available for
download at www.darcnw.noaa.gov/eb-rest.htm.

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[September 2003]

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Duwamish/Diagonal Sediment Remediation Project Environmental Assessment

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1. INTRODUCTION

1.1 PURPOSE AND NEED FOR RESTORATION

The Duwamish/Diagonal Sediment Remediation Project (Duwamish/Diagonal Project or Project) is one of several sediment remediation projects proposed by the Elliott Bay/Duwamish Restoration Program Panel (Program, Panel, or EBDRP). The Program is administered by a panel of participating governments responsible for implementing the requirements of a 1991 settlement between the Natural Resource Trustees and King County and the City of Seattle.¹ The United States alleged in its lawsuit that King County (at that time Metro) and the City of Seattle were responsible for injuries to natural resources by releasing hazardous substances from their sewerage systems into Elliott Bay and the lower Duwamish River. In the Consent Decree the participating governments agreed to help restore and replace natural resources injured by pollution in Elliott Bay and the lower Duwamish River. The settlement established the Panel for the purpose of selecting and implementing sediment remediation and habitat development projects, and source control actions.

The Program identified 24 potential sediment remediation sites associated with King County and City of Seattle combined sewer overflows (CSOs)² and storm drains in Elliott Bay and the lower Duwamish River. These sites were screened against specific criteria and prioritized (see "Concept Document," EBDRP 1994a). The Duwamish/Diagonal Project site was one of the four selected sites.

This Environmental Assessment (EA) was prepared under the requirements of NEPA to determine whether or not there would be significant impacts to the quality of the human environment from the preferred environmental alternative selected for this project. The lead federal agency for NEPA compliance purposes is the National Oceanic and Atmospheric Administration (NOAA). King County is the responsible agency under SEPA. The other federal and state agencies and tribal members of the Panel are cooperating agencies. The lead federal and state agencies and the Panel participants will be monitoring this project to ensure that any potential environmental impacts which may arise during the course of project development are addressed.

¹ United States et al. v. the City of Seattle and the Municipality of Metropolitan Seattle, Civ. No. C90-395WD (W.D. Wash., Dec. 23, 1991). In 1994, the Municipality of Metropolitan Seattle became the King County Department of Metropolitan Services. The Natural Resource Trustees are: the National Oceanic and Atmospheric Administration, under the U.S. Department of Commerce; the U.S. Department of the Interior, acting through the U.S. Fish and Wildlife Service; the Muckleshoot Indian Tribe; the Suquamish Tribe; and the State of Washington, acting through the Department of Ecology. The Consent Decree and the Concept Document, both incorporated herein by reference and made a part of the Administrative Record, provide additional information on the settlement.

² CSOs are relief points in the sewer system at which flows of a combination of surface water runoff and sewage that exceed the system's capacity are discharged to surface waters. A more complete explanation of CSOs is provided in the Cleanup Study Plan.

This EA incorporates by reference the "Concept Document" (Panel Publ. 7, June 1994, EBD RP 1994a), as amended. The Concept Document describes the program, the criteria used to identify and evaluate projects and sites, the potentially affected environment, and the potential environmental impacts of alternative techniques and technologies applicable to sediment remediation projects. The Concept Document also describes the National Environmental Policy Act (NEPA), as amended, and the State Environmental Policy Act (SEPA) environmental review processes.³

This EA also incorporates by reference Panel publications and King County reports that evaluated this proposed project. The Cleanup Study Report provides information about the project site and the affected environment, including information about the historical uses of the upland property and adjacent properties, the source control activities at the site, and the various contaminant sampling efforts at this location. The Cleanup Study Report consists of the Draft Cleanup Study Report (EB/DRP Panel Publ. 30, December 2001) and three addenda: "Expanded Area for the Duwamish Diagonal Cleanup Project" (April 2002), "Source Control Summary for the Duwamish Diagonal Cleanup Project" (April 2002), and "Responses to Reviewer Comments on the Draft Cleanup Study Report" (April 2002). A complete list of the other project-specific documents can be found at Section 8.1.

NOAA is responsible only for the approval of the sediment remediation and removal project as fulfilling requirements under the Consent Decree. EPA is the federal agency responsible for regulatory oversight of the disposal of the sediments. This EA consequently is limited to analyzing the environmental impacts of the sediment removal and remediation alternatives. For more information about disposal of sediments from this project, see the Explanation of Significant Differences for Commencement Bay projects at the EPA websites:

<http://www.epa.gov/superfund/accomp/success/hylebos.htm> and <http://yosemite.epa.gov/r10/cleanup.nsf/webpage/Commencement+Bay-Nearshore+Tideflats>. The EPA contact person for Commencement Bay is: Peter Contreras, Remedial Project Manager, EPA Region 10, at 206-553-6708.

1.2 PUBLIC PARTICIPATION

The public has had numerous opportunities to comment on the Panel's selection of this project, including during the development of the Concept Document, and through the Panel's public meetings and open houses.

Project-specific public comment periods and public meetings were held as follows:
01/22/02-02/21/02 Public comment period on Draft Cleanup Study Report

³ NEPA: 42 USC 4321 *et seq.*, 40 CFR Parts 1500-1508, and requirements set out in NOAA's Administrative Order 216-6; SEPA: Ch. 43 RCW, Ch. 197-11 WAC.

02/22/02-03/01/02	Extension of comment period
02/19/02	Public meeting
02/27/02	Special meeting with Duwamish River Cleanup Coalition
02/28/02	Comments received from Coalition
04/02	Addenda on expanded Area, response to comments
05/06/02-05/20/02	SEPA Determination of Non-Significance (DNS), comment period
06/02/02-06/26/02	Public comment period on Cleanup Action Decision
06/19/02	Public meeting
06/02	Additional repositories established
05/21/02-present	Permit applications, informal public comment reviews
summer 2003	NEPA - EA public comment period

1.3 ADMINISTRATIVE RECORD

This EA references a number of resource documents prepared by and for the Program and through the SEPA process, including the applications and permits required for this project. These documents, incorporated by reference into this EA, are part of the Administrative Record on file for this project with the lead agencies and may be viewed at:

NOAA, Damage Assessment and Restoration Center NW
7600 Sand Point Way NE
Seattle, WA 98115-0070
Contact: Alexandra Von Saunder, EB/DRP Secretary
(206) 526-4348

The complete construction record for the Duwamish/Diagonal Project will be on file with the King County Project Manager:

Priscilla Hackney
Department of Natural Resources and Parks
Wastewater Treatment Division
King Street Center
201 South Jackson Street
Seattle, WA 98104-3855
(206) 684-1791

2. DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

2.1 PROJECT DESCRIPTION

The Duwamish/Diagonal Project is located in the Duwamish River in the City of Seattle, Washington approximately 1.86 miles (3 kilometers) south (upstream) of the River

mouth (Figure 1). The lower six-mile segment of the River, including the project site, flows through a major industrial area in the southern part of Seattle (Figure 2). This segment of the River is an industrial waterway that is heavily used for marine transportation. It is maintained as a navigable waterway by the U.S. Army Corps of Engineers (Corps) through periodic dredging. On September 13, 2001, the U.S. Environmental Protection Agency (EPA) added the Duwamish River to the National Priorities List (EPA 2003). EPA and Ecology determined that the Duwamish/Diagonal Project would be an early-action site because of the elevated PCB levels and the amount of progress already made on the partial cleanup plan.

The project site, the adjoining shoreline, and nearby land areas have all been disturbed, in some places multiple times, during the past 60 or more years of industrial use. Most of the shoreline near the project site is covered by riprap. The offshore boundary of the site is on the edge of, or slightly within, the navigation channel. The navigation channel is approximately 200 feet wide and 30 feet deep (below the mean lower low water (MLLW) line) (NOAA 1998). At the project site the eastern side of the navigation channel is approximately 250 feet from the east bank of the River. The boundaries of the navigation channel are shown as dashed lines parallel to the riverbank in Figure 3. Channel side slopes are relatively steep due to regular dredging of the navigation channel. River bottom depths in the project area range from 0 feet MLLW at the shoreline to about 30 feet MLLW at the bottom of the navigation channel.

In the vicinity of the Duwamish/Diagonal Project site, surface water and, in two cases, sewage from CSOs can enter the Duwamish River from four discharge pipes:

Diagonal Way Storm Drain/CSO outfall (144-inch diameter)
Duwamish CSO outfall (36-inch diameter, no overflows since 1989)
Diagonal Avenue South Storm Drain outfall (18-inch diameter)
Former Diagonal Avenue Treatment Plant Outfall

The EB/DRP Concept Document (pp. 29-30) describes these sources as follows:

“Diagonal Way. Large-volume combined sewer overflow/storm drain (68 million gallons per year). Combined sewer overflow reduction was completed in 1993. Low flow diversion structures were installed in the new storm drain system; low stormwater flows were diverted to the Metro system for treatment. A shoreline outfall structure is located on the east bank of the Duwamish River across from the north end of Kellogg Island. Sediment near this outfall and the Duwamish Pump Station exceeds Cleanup Screen Levels for mercury, silver, and phthalates. Several other compounds, including lead, PCBs [polychlorinated biphenyls] and some PAHs [polycyclic aromatic hydrocarbons], were below Cleanup Screening Levels, but above Sediment Quality Standards.”

Duwamish Pump Station. A large combined sewer overflow volume (130 million gallons per year) has been predicted for this pump station site. However, measurement of wet-

well elevations suggests no overflows occurred in 1991 or 1992.⁴ The submerged outfall pipe is located across from Kellogg Island on the east bank of the Duwamish River, less than 200 feet upstream of the Diagonal Way outfall. Contamination at this outfall is similar to that measured at the Diagonal Way outfall. These areas would likely be cleaned up together.”

The project proposes to achieve the State Sediment Management Standards (SMS)⁵ throughout two rectangular cleanup areas (Area A and Area B) by removing a layer of contaminated sediment and installing an engineered isolating sediment cap in each area. The proposed cap will maintain existing water depths and river bottom elevations. The contaminated sediment to be removed has concentrations that exceed the State Sediment Quality Standards (SQS) values for PCBs, mercury, bis (2-ethylhexyl) phthalate, and butyl benzyl phthalate.

While more detailed information is available in the Cleanup Study Report, the following information describes the proposed dredging and capping activities, sediment transportation and capping disposal issues, and monitoring activities.

Site Description and Dredging and Capping Activities

The two cleanup areas form abutting rectangles near the eastern shore of the Duwamish River. Area B is immediately upstream of Area A. Figure 3 shows both areas and their proximity to the four outfalls listed above. The following are descriptions of the two areas and associated project activities.

Cleanup Area A. Cleanup Area A is adjacent to the Diagonal Way SD/CSO Outfall and the Duwamish CSO Outfall. Area A contains sediments exceeding Washington State SQS or Cleanup Screening Levels (CSL) values for PCBs, mercury, bis (2-ethylhexyl) phthalate, and butyl benzyl phthalate. Area A is approximately 4.8 acres in size and is a rectangular shape approximately 750 feet along the shoreline (upstream to downstream) and 260 feet wide (inshore to offshore).

Area A's inshore boundary is the riprap shoreline. The upstream and downstream boundaries were established based on bioassay stations that showed no toxicity or only low-level toxicity. The offshore boundary is the east channel line. This line was established as the boundary because the chemical levels in this area are equal to or lower than the chemical levels present at the bioassay stations used to define the upstream and downstream boundaries. The bottom elevation at the east channel line is

⁴ No overflows have occurred since that time.

⁵ The State of Washington Sediment Management Standards marine chemical criteria for aquatic life are defined for two effects levels: 1) Sediment Quality Standards (SQS) criteria, which establishes a level that will result in no adverse effects on biological resources; and 2) Cleanup Screening Level (CSL) criteria, which establish minor adverse effects levels and Minimum Cleanup Levels (MCULs) that may be applicable to certain sites.

-30 feet (*i.e.*, 30 feet below the MLLW level). Figure 4 details Area A's site boundaries and slopes.

Under the preferred alternative, an engineered isolating sediment cap will be deposited on Area A following dredging so that the surface of the cap will be at about the existing bottom elevations. Approximately 44,000 cubic yards (cy) of in-place contaminated sediment will be removed from Area A. Because the in-place sediment will expand by about 10 percent when dredged, this will yield a volume of about 48,000 cy for disposal. About 44,000 cy of clean sediment capping material will be spread over the area, forming the isolating sediment cap. The capping material will consist of several types of materials, including sand, gravel, cobble, and loose rip-rap. These materials will be applied in layers to different parts of the site to not only isolate underlying sediments but also provide habitat and help prevent erosion (see Figure 4). An 8- to 12-cy bucket mechanical clamshell dredge will be used to remove the contaminated sediment and either the same type of dredge or bottom dump barges will be used to spread the clean material over the site. The minimum depth of both the sediment layer removed and the cap will be about three feet, but the sloping conditions of the site will result in greater depth of both the sediment layer removed and the cap in many locations. Bottom elevations near the east channel boundary will be deepened by two feet (to an elevation of 32 feet MLLW instead of the Corps' usual required 30 feet MLLW). This over-dredge will provide storage capacity to limit the potential need for dredging of deposited sediments in this area of the River.

Cleanup Area B. Cleanup Area B is located offshore of the former Diagonal Avenue Treatment Plant Outfall. Area B includes sediments exceeding the Washington State SQS/CSL values for PCBs and bis (2-ethylhexyl) phthalate. Area B is approximately 2.1 acres in size and is a rectangular shape approximately 500 feet upstream-downstream and 160 feet wide.

The boundaries of Area B were located to ensure removal of all sediments above the CSL value for PCBs at this location, as well as a large amount of surrounding sediment that exceeds the SQS for PCBs. The eastern boundary of the dredging area will be near the offshore side of a pier at about the 15-foot MLLW elevation contour. Figure 4 details Area B's site boundaries and slopes. The dredge cuts shown for Area B extend to the southeast corner where there is a steeper slope and when the sediment in this area is removed the dredge cut will have a sloped bottom. The offshore boundary extends about 50 feet into the navigation channel and in this area will be overdredged so that when capping is complete the bottom elevation will be two feet deeper than the 30 foot channel depth. A slope stability analysis was conducted and is included in the Engineering Design Report (EBDRP 2003). That analysis concludes that the cap material will be stable on the slope. The draft Engineering Design Reports (60% and 90%) were reviewed by Ecology and EPA and the final (100%) document will be released to the public at the beginning of the dredging contract bid process.

Under the preferred alternative, an engineered isolating sediment cap will be deposited in Area B following dredging so that the surface of the cap will be at about the existing bottom elevations. Approximately 22,000 cy of in-place contaminated sediment will be removed from Area B. Because the in-place sediment will expand by about 10 percent when dredged, this will yield a volume of about 24,000 cy for disposal. About 22,000 cy of clean sediment capping material will be spread over the site in the same manner as for Area A. This material will be the same as described for Area A. The minimum depth of both the sediment layer removed and the cap will be about 3 feet, but the sloping conditions of the site will result in greater depth of both the sediment layer removed and the cap in many locations.

The entire site (Area A plus Area B) covers an area of 6.9 acres. Under the preferred alternative, a total of about 66,000 cy of contaminated sediment will be removed from the site. Because sediment will expand by about 10 percent when dredged, the volume that must be transported will be about 72,000 cy. After all dredging is complete, the project area will be capped with about 66,000 cy of clean sediment capping material to restore the area to existing bottom elevations and slopes. The capping material will be obtained from the Corps maintenance dredging in the turning basin of the Duwamish River (at the upper end of the Duwamish waterway) or another source of clean material.

Under the preferred alternative, Cleanup Area B will be dredged first, followed by Area A. The purpose of this upstream-to-downstream sequence is to minimize potential recontamination of Area A from the dredging of Area B, which has the highest PCB concentrations. The entire project area will be dredged before any capping occurs.

Three or more barges will be used for project activities. The dredging crane will sit on one barge. The crane will fill the first haul-barge, which will then be delivered to the appropriate off-loading site. While the first haul-barge is being off-loaded, a second haul-barge will be positioned at the dredge site for filling with dredged material. Once filled, the second haul-barge will be delivered to the appropriate off-loading site. While the second haul-barge is being off-loaded, the first haul-barge or another haul-barge will be returned to the dredge site for filling. This cycle will continue until all dredging is complete.

Sediment Transportation and Disposal

Two possible transport and disposal options are being considered for the contaminated sediments. One option would be to barge the sediments to the Port of Tacoma's Blair Waterway Slip #1 nearshore confined aquatic disposal facility, where it would be deposited. During dredging about one barge-load per day would be taken to this facility.⁶

⁶ This facility has been designated by the EPA to receive contaminated sediments.—The facility is located in the Blair Waterway of Commencement Bay in the City of Tacoma, Washington. It is a slip formerly used for docking ships and is confined on two sides by earthen piers, with a mouth connecting to the Blair

The other option would be to barge the dredged sediments to a transfer site on the lower Duwamish River and transfer the sediments to sealed disposal containers that would be shipped on rail cars to a RCRA subtitle D landfill (e.g., the Rabanco regional landfill, near Goldendale, Klickitat County, Washington). It is estimated that the material in one barge load will fill between about 38 and 77 rail cars⁷ and that the total amount of dredged material from the project will fill between about 1600 and 3200 rail cars. It is anticipated that the material would be shipped as it is transferred to rail cars over about two months.

No matter which of these options is selected, a few specific sediment samples will be tested for PCB concentrations to determine whether these concentrations are below non-hazardous disposal site limits. If the landfill option is selected, test samples will be collected after sediment is dredged and any sediments found to have PCB concentrations greater than 45 parts per million (ppm) will be separately transported by rail or truck to a hazardous waste landfill, such as the Columbia Ridge landfill near Arlington, Oregon. It is estimated that the volume of this material could be up to one barge load. This would fill between about 38 and 77 rail cars or 88 trucks. If the nearshore confined disposal site option is proposed, PCB testing will be done prior to dredging. If PCB concentrations in the tested representative samples are found to be greater than 45 ppm, the sediments will be sent to a landfill that can accept hazardous waste (Subtitle C).

Either flat-top or bottom-dump barges will be used to transport the sediment. If flat-top haul-barges are used, the contractor will modify the barges to hold and transport all dredge material without leakage. Openings along the rail of the barge will be blocked with filter devices consisting of hay bails and three layers of filter fabric (either fabric with the smallest commercially-available pore size or equivalent filter material). These devices will ensure that excess water on the barge will be filtered through a minimum of three layers of filter fabric (or equivalent) before returning to the River. Most particulate chemical pollutants stay sorbed to sediments, so the filter fabric will retain contaminants and associated sediments and allow water to flow back into the River."

If bottom-dump haul-barges are used, there will be no need to filter water. The bottom-dump barges will retain water within the barge until the bottom of the barge is opened to release the water and sediment in the near-shore confined aquatic disposal facility.⁸ These barges have seals that ensure that no water or sediment is released until the bottom of the barge is opened.

Waterway. A low-permeability earthen berm will be constructed across this mouth to completely enclose the facility. Construction and operation of the facility will be carried out in compliance with EPA requirements.

⁷ Depending on whether one or two sealed containers was transported on each rail car.

⁸ Because of their design, bottom-dump barges would only be used if it was decided to dispose of the sediment at a nearshore confined aquatic disposal facility. Flat-top barges could be used for either of the disposal options.

Capping Material Transportation

Capping material will be transported to the site by barge from a location in the Duwamish River or Puget Sound or from another source of clean capping material (e.g., a quarry). About one barge load of capping material will be taken to the site and deposited each day. Two or more haul-barges will be used to deliver capping sediment to the site. If flat-top barges are used, a dredging crane will be used to place this sediment on the site. If bottom-dump barges are used, they will be slowly opened to deposit their contents on the site.

Monitoring

The project will include a monitoring program that includes both short-term and long-term activities to ensure that project objectives are met. Short-term activities during dredging and capping will include monitoring of water quality, dredging locations and depths, capping locations and thicknesses, dredge material PCB concentrations, and cap material chemical concentrations (to make sure the cap material is clean). Long-term monitoring for cap stability and potential recontamination are proposed to continue for ten years. Details of the monitoring program are provided in Appendix Q of the Cleanup Study Report and subsequent revisions (January and May 2003) (King County, 2003a and b).

Schedule

King County is proposing that the project begin in November 2003 and end by February 15, 2004, although up to two additional weeks could be needed for capping activities. It is estimated that about 75 working days will be required to carry out the project. This time period allows for consideration of fish migration times as well as corresponding well with the Corps' navigational dredging schedule and availability of clean sediment for the project cap. The Biological Opinion (March 2003) acknowledges that there may be some incidental take of chinook salmon and bull trout but believes that the ongoing harm to the species should the sediments not be remediated far outweighs the potential risk to a few individuals of those species during the cleanup. All care will be exercised to minimize potential risks to these species during the dredging operations.

2.2 ALTERNATIVES DESCRIPTION

The four alternatives that met the Panel's selection criteria, sediment remediation screening criteria, and NEPA's evaluation factors are discussed briefly below. The Cleanup Study Report compares in more detail the four alternatives and the rationale for the Panel's selection of the preferred alternative. The alternatives retained for remediating the project site are as follows:

Alternative No. 1 - No Action/Natural Recovery

Under Alternative No. 1, No Action/Natural Recovery, the Program would not take any direct action to restore injured natural resources contrary to the mandate of the parties under the settlement. No sediment remediation activities would occur and no long-term monitoring would be performed using Panel funds. The No Action/Natural Recovery Alternative allows biological impacts to recovery naturally.

For Alternative No. 1 to be selected as the preferred alternative: (1) the natural process must be more effective in restoring the environment than available or potentially available remediation or restoration options and alternatives, (2) the time to recovery must not be significantly different from that resulting from human intervention, (3) the affected area will not suffer from additional adverse ecological effects before the site returns to a natural state, (4) no negative threats to the health and safety of the general public will be caused by the time lag of natural recovery, and (5) funds are not available.

Alternative No. 2 - Maximum Practicable Containment

The overall objective of this alternative is to achieve SQS chemical criteria throughout the cleanup site while maintaining existing navigation channels and shoreline structures, and minimizing dredging and disposal of contaminated sediment. The focus of this alternative is minimizing dredging and disposal volumes. This alternative does not accommodate the objectives of maintaining existing habitat elevations and removing possible future encumbrances to navigation deepening of the federal waterway and adjacent berthing areas. Alternative 2 would combine minimal dredging near the navigation channel and near certain shoreline structures (to accommodate cap backfill), off-site disposal of all dredged materials, and capping the entire site with a clean sand cap designed and constructed in accordance with the EPA and Corps standards, in order to ensure its long-term integrity and performance. Upland source controls such as pipe cleaning would be completed as a separate action prior to initiation of this remedial action.

Alternative No. 3 - Capping with No Change in Existing Elevations (Preferred Alternative)

The overall objective of this alternative is to achieve SQS chemical criteria throughout the cleanup site while maintaining existing depths and elevations throughout the site, thereby minimizing dredging and disposal of contaminated sediment to the extent practicable. In this alternative, maintaining existing habitat elevations predominates over competing objectives of minimizing dredging and disposal volumes and removing possible future encumbrances to navigation deepening of the federal waterway and adjacent berthing areas. Alternative 3 would achieve this objective through a combination of dredging of a surface layer throughout the site (approximately five feet) to accommodate cap backfill, off-site disposal of all dredged materials, and capping the

entire site with a clean sand cap designed and constructed in accordance with EPA and Corps standards, in order to ensure its long-term integrity and performance. Upland source controls such as pipe cleaning would be completed as a separate action prior to initiation of this remedial action.

Alternative No. 4 - Maximum Practicable Removal of Contaminants

The overall objective of this alternative is to achieve SQS chemical criteria throughout the cleanup site while allowing for maximum practicable flexibility in future deepening of the navigation channels, without the risk of exposing or excavating contaminated sediments in the future. In this alternative, removing possible future encumbrances to navigation deepening of the federal waterway and adjacent berthing areas predominates over a competing objective of minimizing dredging and disposal volumes. In addition, the objective of maintaining existing habitat elevations could be achieved by backfilling the excavations with clean material. Alternative 4 would be implemented through a combination of dredging sediments to the maximum practicable extent (excluding within the siphon area⁹), off-site disposal of all dredged materials, capping relatively limited areas of the site such as the siphon where subsurface contaminated sediments will remain in place, and backfilling as necessary. As in Alternatives 2 and 3, upland source controls such as pipe cleaning would be completed as a separate action prior to initiation of this remedial action.

2.3 SELECTION OF PREFERRED ALTERNATIVE

There are several tiers of evaluation criteria (CERCLA,¹⁰ EBD RP, NEPA) that were considered and evaluated prior to selecting the preferred alternative for this project (listed at Appendix 9.2). Proposed alternatives were screened against these overall criteria; those projects that did not meet these threshold requirements were eliminated from further consideration. As a result of that evaluation, several of the proposed alternatives were brought forward for a closer evaluation of their environmental impacts to the quality of the human environment.

The CERCLA and State of Washington Model Toxics Control Act (MTCA) regulations require that the Panel develop a reasonable range of alternatives and then identify the preferred alternatives based on the eight criteria listed in the regulations. Table 1 summarizes the comparison of alternatives for remediation of Area A using these criteria. This project is being conducted under SMS, with Ecology as the lead agency, and includes extensive coordination with EPA to ensure that the project elements meet the intent of CERCLA. Ecology and EPA consider the Duwamish/Diagonal project to be a partial cleanup action due to the potential for additional cleanup to be identified in

⁹ The siphons are two sewer pipes that run under the site.

¹⁰Comprehensive Environmental Response, Compensation and Liability Act of 1990 (CERCLA), 42 USC 9601 *et seq.*, 40 CFR 300)

sediments adjacent to the site. Both Ecology and EPA have authorized this cleanup action.

To comply with the requirements of NEPA, the Panel analyzed the effects of each alternative on the quality of the human environment. NEPA's implementing regulations direct federal agencies to evaluate the potential significance of proposed actions by considering both context and intensity. For the actions proposed in this EA, the appropriate context for considering potential significance of the action is local, as opposed to national or world-wide. The "Concept Document," as amended, and the Cleanup Study Report, provide additional information about all of the remedial alternatives considered by the Panel before it selected Alternative 3 (CAPPING WITH NO CHANGE IN ELEVATIONS) as the preferred alternative. The Panel recommended applying the same preferred cleanup method in both Area A and B since the areas are similar and adjacent and therefore could take advantage of the same technologies and procedures for dredging, transportation, and capping.

Chapters 8 and 9 of the Cleanup Study Report provide a detailed alternatives evaluation for Area A. Alternative 3 (CAPPING WITH NO CHANGE IN ELEVATIONS) was recommended as the preferred alternative based on the eight criteria set forth in the SMS regulation. The EBDP Panel approved this alternative as environmentally protective and cost effective. Alternative 2 (MAXIMUM PRACTICABLE CONTAINMENT BY CAPPING) was rejected because this alternative reduced the bottom depths by about three feet, which is considered undesirable for navigation, tribal fishing activities, and impacts to habitat. Alternative 4 (MAXIMUM PRACTICABLE REMOVAL OF CONTAMINANTS) was rejected because the volume of contaminated material to be dredged and the associated costs were about twice as much as Alternative 3 without providing significant environmental benefit. Alternative 4 included 82,000 cubic yards of dredged material at a cost of \$10.6 million compared to Alternative 3, which had a dredged volume of 42,500 cubic yards and a cost of \$5.89 million. Alternative 1 (NO ACTION) was rejected because natural recovery at the site would not clean up the area within the ten-year time frame required by the SMS.

3. AFFECTED ENVIRONMENT

The following information is an excerpt from the Cleanup Study Report, the Biological Assessment, the State's SEPA checklist, or other references as noted.

3.1 AIR QUALITY

The Puget Sound Clean Air Agency states that our "airshed is greatly influenced by four factors: urban development, the Pacific Ocean, the mountains, and the weather. Most urban development has taken place at elevations near sea level, adjacent to the waters of Puget Sound. The urban corridor extends from south of Tacoma, northward across the Canadian border to Vancouver B.C. Although it is not uniform in density, most of

our air pollution comes from the cities and the network of highways along this north/south line. The Puget Sound region has a modified marine climate. For most of the year the region's weather is dominated by influxes of clean, moist ocean air that penetrate at low elevations from the Chehalis gap to the south and the Strait of Juan de Fuca to the north. Temperatures are generally moderate with few extremely cold or hot days throughout the year. Wind-driven mixing regularly occurs which effectively disperses air pollutants. During periods when our onshore air flow is interrupted, the combined effects of urban activities, the weather, and topography lead to stagnation and rising air pollution. The Olympic mountains to the west and the Cascade mountain range to the east form the sides of a bowl when air pollution becomes trapped in the urban basin (<http://www.pscleanair.org/airq/airshed.shtml>).

3.2 SEDIMENT CHARACTERISTICS

The Duwamish River experiences high sedimentation rates, estimated between about a quarter inch/year (EBDRP 1996a) and about two inches/year (Harper-Owes 1983). The river substrate is a mixture of sandy-silt to silty-sands. Soils in the river channel are prone to liquefaction during seismic events, according to City of Seattle Environmentally Critical Areas maps. The major chemicals of concern found in sediment in the project area are PCBs, mercury, bis (2-ethylhexyl) phthalate, and butyl benzyl phthalate. The mudflat adjacent to the Diagonal Way CSO/SD outfall and the Duwamish CSO outfall is a stable depositional region, created in part by discharged sediments from these outfalls.

3.3 WATER QUALITY

The Duwamish River is rated as Class B freshwater according to state water quality standards, from the mouth at Elliott Bay upstream to river mile 11 (WAC 173-201A). The lower Duwamish River estuary is also on the Washington State Department of Ecology 303(d) List of Threatened or Impaired Waterbodies (WDOE 2002), because it has exceeded state quality standards for over 50 different contaminants that are presently released into the lower Duwamish River estuary through sewage overflows and industrial runoff.

3.4 BIOLOGICAL RESOURCES

Benthic Community. At the project site, at the mid- to lower intertidal elevations, riprap and pilings support a benthic community dominated by barnacles (*Balanus glandula*), mussels (*Mytilus trossulus*), and the algae *Fucus gardneri*. Where the intertidal area is covered by ballast rock this substratum supports seaweeds. Just downstream (north) of the Diagonal outfall, a small pocket-beach supports a good infaunal community, including polychaetes and oligochaetes. Shore crabs (*Hemigrapsus oregonensis*) are common under cobbles on the beach but no clams have been observed.

Fish and Wildlife Species. The Duwamish estuary provides habitat for more than 20 marine and anadromous fish species (Warner and Fritz, 1995). Marine fish species found in abundance include English sole (*Parophrys vetulus*), starry flounder (*Platichthys stellatus*), Pacific staghorn sculpin (*Leptocottus armatus*), shiner perch (*Cymatogaster aggregata*), and Pacific herring (*Clupea harengus*).

There were 58 species of birds observed over three seasons of monitoring at four Coastal America restoration sites along the Duwamish River (Cordell *et al.* 1997). Fifteen bird species were observed on the Duwamish Waterway, near Terminal 107 and the Seaboard Lumber site during previous studies conducted in 1995 and 1997-1998 (NMFS 1998).

The Duwamish River also provides important foraging habitat to waterbirds throughout the year. During previous studies conducted in 1995 and 1997-1998 (NMFS 1998), 39 species of waterbirds were observed near Kellogg Island on the Duwamish Waterway, approximately 0.5 miles upstream of the project site. Nine mammal species and eighty-four bird species have been observed in the Duwamish River estuary (Tanner 1991).

The Biological Assessment (App. 9.1) provides additional details on these resources. Consultation with the National Marine Fisheries Service (NMFS) and the USFWS under Section 7 of the ESA and the Magnuson-Stevens Fishery Conservation and Management Act for essential fish habitat (EFH) considerations has occurred (App.9.1). NMFS and USFWS issued a Biological Opinion and EFH conservation recommendations for the project on March 17, 2003 (App. 9.1).

3.5 THREATENED AND ENDANGERED SPECIES

Salmonids. The Duwamish River is a significant migratory route, rearing area, and holding area for anadromous salmonids in the Green/Duwamish River Basin (NMFS 1998, Salo and Grette 1986). The Green River (*i.e.*, the upper reach of the Duwamish River) and the lower reaches of its tributaries provide important spawning habitat. Studies have shown that, of the five Pacific salmon species, chinook salmon (*Oncorhynchus tshawytscha*) are most dependent on estuaries during the early stages of their life cycle (Varanasi *et al.* 1993). Chinook salmon are listed as a threatened species and the critical habitat designations have been made by NMFS (NMFS 2002). Juvenile chinook salmon were found to be most abundant near Kellogg Island between April and June.

The Duwamish River also supports runs of chum salmon (*O. keta*) and summer and winter runs of steelhead trout (*O. mykiss*) (WDFW and Western Washington Treaty Tribes 1994). Chum salmon are particularly dependent upon an estuary for growth before moving to marine areas. Upstream adult steelhead migration occurs year round. Additional information about salmon stocks and trout in the Green/Duwamish River can be found in the Biological Assessment (App. 9.1)

Bald Eagles. The bald eagle (*Haliaeetus leucocephalus*) is listed as a threatened species under the ESA (50 CFR 17.11). Bald eagles are present in Elliott Bay all year and have been observed on the Duwamish River (Cordell *et al.* 1997). The nearest bald eagle nest is approximately 2.5 miles northwest of the project site (USFWS 2002) and is outside of the project area. Bald eagles may forage in the mudflats near the project site and therefore potentially may be present in the project area during work activities. However, any bald eagles that forage in the project area are likely acclimated to noise and anthropogenic disturbances.

Bull trout. Bull trout (*Salvelinus confluentus*) is listed as a threatened species under the ESA. The US Fish and Wildlife Service (USFWS) believes that bull trout might inhabit the area in the project's vicinity (BO, App. 9.1). Bull trout are generally non-anadromous and live in a variety of habitats. The migration periods of juvenile bull trout are similar to that of juvenile chinook salmon so if bull trout do occupy the proposed project area, it is likely that the use is one of migration and feeding. Anadromous fish migrate to the ocean in the spring and return in late summer and the early fall. Spawning does not occur in the estuary. Because of the complexities involved in the life history characteristics of bull trout, and the considerable variation among sub-populations, it is difficult to isolate and estimate how, and to what extent, particular activities may impact bull trout.

3.6 PUBLIC HEALTH/SAFETY.

There are no marine obstacles or structures at the site that affect public safety. The presence of contaminants in the sediments and water column may have deleterious effects on humans and other species either through contact or ingestion. The Program selected this sediment remediation project in part because it exceeded the State of Washington SMS marine chemical criteria for aquatic life, for the protection of natural resources, and human health considerations.

3.7 CULTURAL/ARCHAEOLOGICAL RESOURCES.

There are no landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. The closest known cultural site of significance is located on the western shore of the River where evidence of a Native American village remains. That area has been examined and has not led to any information regarding cultural use of the site (Rice *et al.* 1989). The site was marshland until the early part of the twentieth century, and early cultural uses, if there were any, would likely have been removed when the area was dredged to straighten the channel. The Duwamish Band of Indians have purchased the land, some 500 feet away, for a proposed longhouse/cultural center and hosts an intertribal gathering during the fall season. Consultation with the Office of Archeology and Historic Preservation has occurred (App. 9.1).

The Muckleshoot Indian Tribe relies on the natural resources of the lower Duwamish River for its usual and accustomed treaty rights and would be consulted should any potential impacts to tribal resources arise.

3.8 TRANSPORTATION.

The Duwamish River is a navigable waterway routinely dredged and maintained by the Corps. The river is used for barging, shipping, and transportation. Extensive road and rail networks exist near the project site.

3.9 RECREATION.

The Duwamish River provides opportunities for sport and tribal fishing. Fishing activities in the lower Duwamish River and Elliott Bay are co-managed by the Muckleshoot Indian Tribe, the Suquamish Indian Tribe, and the Washington Department of Fish and Wildlife. There are several marinas on the River and large numbers of recreational boats that traverse the River. The River is also used for kayaking and canoeing. The river-side is used by kayakers, canoeists, bird watchers, walkers, joggers, and bikers, although opportunities for some of these activities are limited in the immediate vicinity of the project.

3.10 LAND USE.

The site itself is an industrial waterway and is used for marine transportation and tribal and recreational fishing. Land use in the vicinity of the project site is commercial/industrial. Two Port of Seattle container facilities (T106 and T108) border the site to the north and the south. Seattle City Light has an easement for the power transmission lines along the South Oregon Street right-of-way. These lines cross the Duwamish River just north of the Duwamish/Diagonal outfalls. A railroad yard lies approximately 0.4 miles to the east and a large Washington State Liquor Control Board warehouse is located approximately 100 yards northeast.

3.11 ECONOMICS.

The Duwamish industrial corridor extends from Harbor Island to the City of Tukwila. This corridor is the most concentrated area for industry in the State of Washington and covers more than 8,500 acres. The 2,000 plus businesses in the corridor provide nearly 87,000 jobs, with an annual payroll of \$2.5 billion. One in ten jobs in King County is found in the Duwamish industrial corridor (Environmental Coalition of South Seattle 1999).

3.12 AESTHETICS.

Because this is an industrial corridor, the only aesthetic differences relate to the short-term dredging activities from the equipment and additional workers which may be a

visual distraction during the course of the project. Light and glare from roads and buildings across the River are common.

3.13 NOISE

The project is located in an industrially zoned area and noise levels are a reflection of current land use and operations associated with those uses. Sources of background noise include automobile, boat, and airplane traffic.

4. ENVIRONMENTAL CONSEQUENCES

To restore resources lost, the Panel examined a variety of proposed actions under the alternatives, with the intent of avoiding or reducing negative impacts to existing natural resources and services to the greatest extent possible. The Panel believes that the project will not cause significant negative impacts to natural resources or the services they provide. Prior to granting a permit for the project the Corps entered into formal ESA Section 7 consultation with the USFWS and NMFS. These agencies issued a Biological Opinion (BO) on the project on March 17, 2003 (App. 9.1). This opinion concluded with a finding that the project "may affect and is likely to adversely affect" threatened species or their critical habitat but not likely to jeopardize the continued existence of Puget Sound chinook. The BO included conservation measures to minimize the potential impacts of the project on these species or their critical habitat. The Corps included these measures in its permit conditions.

Additional mitigation measures and monitoring plans will be in place to minimize short-term impacts. All appropriate permits will be applied for and each of their conditions met for the project.

All of the project alternatives have both adverse and beneficial environmental impacts. These impacts are discussed in the remainder of this section.

For the most part, the three action alternatives (Alternatives 2, 3 and 4) have the same types of direct, indirect, and cumulative environmental impacts. Almost the only differences in these impacts between the alternatives are in magnitude.

The differences in magnitude of adverse impacts among the final four alternatives can be generally summarized as follows. The majority of both short-term and long-term impacts are related to the amount of sediment dredged. This amount increases from none under Alternative 1 through progressively greater volumes under Alternatives 2, 3, and 4. For the most part, the magnitude of short-term impacts increases in direct proportion to the amount of sediment dredged. Consequently, these impacts tend to be least under Alternative 1 and progressively greater under Alternatives 2, 3, and 4. Conversely, the magnitude of long-term impacts tends to decrease with increasing

amounts of sediment dredged, because the greater the volume of sediment removed, the fewer contaminants are left in place to cause long-term impacts. As a result, long-term impacts tend to be greatest under Alternative 1 and progressively smaller under Alternatives 2, 3, and 4. There are some exceptions to this pattern. These are identified in the appropriate sections below.

The differences in magnitude of beneficial impacts among the four alternatives apply only to long-term impacts. None of the alternatives would have beneficial short-term impacts. All of the short-term impacts would be adverse, as detailed below. However, beneficial long-term impacts would increase with the increasing amounts of contaminated sediment removal from Alternative 1 to Alternative 4. These beneficial impacts are discussed below.

The following discussion of environmental consequences is structured as follows. For most elements of the environment the potential adverse impacts of the preferred alternative are discussed first, followed by a comparison of these impacts to those of the other alternatives if there are any differences. For some elements, these two discussions are combined into one. Potential beneficial impacts are also described where they are expected.

4.1 AIR QUALITY

Preferred Alternative

Under the preferred alternative, short-term emissions are expected as a result of transport of dredge material and disposal. Increased exhaust emissions are expected from the crane, tugboats, trains, and workers' vehicles. Emissions would consist of fossil fuel combustion byproducts. The quantities are unknown at this time. Construction equipment would be equipped with exhaust controls and would be operated only during construction activity to reduce emissions. Emissions from vehicles used during construction are regulated by the EPA and the Puget Sound Clean Air Agency. No emissions will result after completion of the project.

Alternatives Comparison

No air quality impacts would result from the Alternative 1, No Action. Air quality impacts of Alternatives 2 and 4 would be of the same type as those of the Preferred Alternative. Alternative 2's impacts would be less than those of the preferred alternative and Alternative 4 impacts would be greater.

4.2 SEDIMENT QUALITY

Preferred Alternative

Under the preferred alternative, the proposed project would remove about 66,000 cy of in-place (about 72,000 cy expanded), highly-contaminated sediment containing PCBs, phthalates, and metals, thereby removing a large source of bioavailable contaminants from the lower Duwamish River estuary habitat and food web. The proposed project would improve conditions within the channel in the long-term.

Of the sediment that would be suspended during dredging activities, sand particles would quickly settle on site, or, if flat-top barges were used, be retained by filters on the haul barge. Only fine silt and clay particles would potentially drift up or downstream. The contaminant concentrations in fines that may settle outside of the immediate project area would be insignificant compared to existing contaminant concentrations in the project area.

Transport of suspended dissolved or particle-bound contaminants could occur upstream of the project site to the distance of the tidal salt wedge, and downstream of the project site into Elliott Bay. Because the project area is relatively close to the Duwamish River mouth at Elliott Bay (1.86 miles upstream), tidal flushing to Elliott Bay would be strong during the ebb tide, and resuspended sediments are expected to be quickly mixed to background concentrations both upstream and downstream of the project area.

Alternatives Comparison

Because Alternative 1, No Action, would leave all of the contaminated sediment in place, it would have no short-term construction-related impacts on sediment quality but would have the greatest long-term sediment quality impacts of all of the alternatives. The sediment quality impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2's short-term construction-related sediment quality impacts would be less than those of the preferred alternative because Alternative 2 would disturb and resuspend less sediment. Alternative 2's long-term sediment quality impacts would be greater because this alternative would leave more contaminated sediment in place. Alternative 4's short-term construction-related sediment quality impacts would be greater than those of the preferred alternative because Alternative 4 would disturb and resuspend more sediment. Alternative 4's long-term sediment quality impacts would be less because this alternative would leave less contaminated sediment in place. Beneficial impacts on sediment quality would increase from Alternative 1 through 4, with increasing amounts of contaminated sediment removal.

4.3 WATER QUALITY

Preferred Alternative

The proposed dredging project will cause some suspension of sediment in the water column and will release some contaminated sediments downstream of the project area. Short-term turbidity increases caused by the project activities are expected to comply with the authorized mixing zone of 300 feet and should dissipate due to tidal influence and freshwater flow. In the long-term, the proposed project will not affect turbidity levels in the project area or in the lower Duwamish River estuary in general.

Measures will be taken to minimize potential water quality impacts. These will include minimizing barge anchor movement, minimizing sediment disturbance by the dredge bucket, filtering return water (see project description above) and conducting water quality monitoring at the beginning of dredging and capping activities. No negative long-term impacts to water quality are expected. Because contaminated substances in the sediment are being removed from the River, it is anticipated that overall water quality in this area will improve after project completion.

Alternatives Comparison

Because Alternative 1, No Action, would leave all of the contaminated sediment in place, it would have no short-term construction-related impacts on water quality but could have the greatest long-term water quality impacts of all of the alternatives. The water quality impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2's short-term construction-related water quality impacts would be less than those of the preferred alternative because Alternative 2 would disturb and resuspend less sediment. Alternative 2's long-term water quality impacts could be greater because this alternative would leave more contaminated sediment in place. Alternative 4's short-term construction-related water quality impacts would be greater than those of the preferred alternative because Alternative 4 would disturb and resuspend more sediment. Alternative 4's long-term water quality impacts would be less because it would leave less contaminated sediment in place. Beneficial impacts on water quality would increase from Alternative 1 through 4, with increasing amounts of contaminated sediment removal.

4.4 BIOLOGICAL

Preferred Alternative

Benthic fauna (such as bivalves, polychaetes, and crustaceans) are an important food source for foraging fish in estuarine habitats. Dredging would result in the destruction of those benthic organisms that currently inhabit the substrate within the project site. Capping the areas with clean sand or habitat mix (sandy gravel) would provide an

improved substrate for recolonization by these species. Cap material used in similar projects has quickly recolonized with infauna and epifauna (McCauley et al. 1977, Richardson et al. 1977, Romberg et al. 1995). The rate of recolonization would depend on water depth, substrate type, water currents, and larval types and densities.

Any fish, such as bull trout, juvenile chinook salmon, or coho salmon, that may be present at the site during project activities, could be injured or entrained by the clamshell dredge or by high turbidity levels. However, while lethality in fish has been reported at high suspended sediment concentrations, recent studies have shown that total suspended sediment concentrations do not exceed 400 mg/L in areas adjacent to bucket dredge sites (Nightingale and Simenstad 2001). Therefore, no fish mortality is expected to occur as a result of the expected suspended sediment concentrations from this dredging project.

Non-lethal effects may result from the proposed clamshell bucket dredging operation. For example, turbidity decreases light penetration in the water column. Because salmonids are visual feeders, light conditions determine fish ability to school, signal the presence of potential predators, establish a background against which feeding relationships develop, and provide migration orientation (Nightingale and Simenstad 2001). Turbidity in non-lethal concentrations can have adverse effects on fish through behavior modification or gill laceration (Martens and Servizi 1993).

The WDFW has established a fish protection work window for lower Duwamish River dredging projects: October 15 through February 14, which is the period when salmonids are least likely to occur in the project area. The USFWS has concurred with this window for the protection of bull trout. NMFS typically enforces the work window established by WDFW; however, the window may be modified during project-specific formal consultation. This work window is meant to minimize the impacts of dredging projects on fish, and is considered a suitable impact minimization method by WDFW, USFWS, and NMFS (Washington State Department of Fish and Wildlife, 2002) (see also, Biological Opinion, App. 9.1).

Because the proposed project is adjacent to the navigation channel and the currents in the project area are complex, fish exclusion devices and/or silt screens are not practicable and are not planned for use at any time during project activities. Therefore, any salmon migrating through the project area would not be excluded from the dredging activities. Temporary adverse impacts to bull trout, juvenile chinook salmon, and coho salmon in the project area therefore could occur as a result of high turbidity levels in the project area. The proposed project is expected to occur within this prescribed window, but could take up to two weeks longer for capping, if necessary. Although the Duwamish River chinook and coho outmigrations are not expected to occur during most of the project work period, juvenile chinook salmon and juvenile coho salmon are likely to be present during project activities. Bull trout may be present during project dredging activities, although their presence in the lower Duwamish is largely unknown. The

project would strictly adhere to the terms and conditions set forth in the permits and in the consultations with the USFWS and NMFS.

Particle-bound contaminants may be consumed by benthic filter feeders. Fish that consume these filter feeders may be adversely affected through the process of bioaccumulation. Benthic species may also accumulate dissolved contaminants. Chemical bioaccumulation through the food web can cause permanent adverse effects on invertebrates, fish, birds, mammals, and humans. In general, as sediments are disturbed by dredging, bioturbation, or erosional scour, contaminants can be made available for bioaccumulation. Contaminants such as PCBs and mercury that are currently available for bioaccumulation by benthic organisms, and would become available to other organisms if sediments are dredged, may also become bioavailable in the future by leaching and sediment disturbance if these sediments are left in place.

The proposed project would inevitably release a small concentration of contaminants into the water column, which could become bioavailable. However, more contaminants would be available for bioaccumulation over the long-term if the project did not occur and the PCBs were left in place. This short-term contaminant release would be insignificant compared to existing elevated contaminant levels in the lower Duwamish River estuary, and would be outweighed by the long-term net decrease in bioavailable contaminants in the project area.

Alternatives Comparison

Same as section 4.3 Alternatives Comparison, above.

4.5 THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT

Preferred Alternative

Based on an analysis of proposed project impacts on species and habitat, and their functions in the action area, it was determined that there would be no effect on bald eagles, and the potential effects on all fish species include both beneficial and adverse effects. Because bald eagles in the project area are acclimated to high levels of ambient noise and shipping activity and do not nest within a 0.5-mile radius of noise sources within the project area, no effect on bald eagles is expected.

The proposed project is likely to adversely affect bull trout and chinook salmon that may occur within the project action area during project activities. No population-level adverse impacts to these species are expected. In the long-term, the proposed project would be beneficial to the lower Duwamish River estuary ecosystem and the species it supports by removing and isolating contamination from the environment, thereby decreasing long-term contaminant exposure. However, several short-term adverse impacts associated with the proposed project are likely, including: temporary

resuspension of contaminants, increased high turbidity levels that could harm fish in the project area, and fish entrainment during dredging procedures. All adverse impacts to fish are expected to be temporary, and are minimized by the proposed conservation measures and best management practices. As noted above, the project would strictly adhere to the terms and conditions set forth in the permits and in the consultations with the USFWS and NMFS to minimize any adverse impacts to threatened or endangered species. Upon project completion, the Panel expects that there will be long-term benefits to these species because their habitat will consist of clean sediments.

Alternatives Comparison

Because Alternative 1, No Action, would leave all of the contaminated sediment in place, it would have no short-term construction-related impacts on threatened and endangered species but could have the greatest long-term impacts on these species of all of the alternatives. The biological impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2's short-term construction-related impacts would be less than those of the preferred alternative because this alternative would take less time and would disturb and resuspend less sediment. Alternative 2's long-term threatened and endangered species impacts could be greater because this alternative would leave more contaminated sediment in place. Alternative 4's short-term construction-related threatened and endangered species impacts would be greater than those of the preferred alternative because Alternative 4 would have a longer term and would disturb and resuspend more sediment. Alternative 4's long-term threatened and endangered species impacts would be less because it would leave less contaminated sediment in place. Beneficial impacts on threatened and endangered species would increase from Alternative 1 through 4, with increasing amounts of contaminated sediment removal.

4.6 PUBLIC HEALTH/SAFETY

Preferred Alternative

The project could result in the dispersion of some contaminated sediment. Dredging crews could come in contact with contaminated sediments while excavating. As part of the dredging contract, a health and safety plan will be required to minimize human health risks.

Dredge material will be tested. If PCB concentrations exceed 45 ppm, the material will be disposed of at a hazardous waste landfill. Of more than 80 samples tested in the two cleanup areas (areas A and areas B), only one sample exceeded the TSCA threshold of 50 ppm. In area B, one sample was 85 ppm but the next highest samples ranged from 11 to 26 ppm. Most material from the project site tested at less than 10 ppm (EBDRP 2002).

The contaminants in the sediments and water column at the site may have deleterious effects on humans and other species either through contact or ingestion. The project's proposed removal of a substantial amount of those contaminants will have beneficial long-term impacts by greatly reducing these potential effects.

There is a small potential for accidental spillage of sediments during transportation. If this occurred during rail or truck transportation, humans could come into contact with the sediments. Emergency cleanup procedures would be used to minimize this contact. If a spill occurred during barge transportation little or no adverse impact is expected because the material would be dissipated by tidal movement and/or freshwater flow.

To minimize the potential for such spills, tug and barge operators must comply with regulations that control the containment of sediments and safety regulations in Puget Sound as well as the Duwamish River. These regulations include the following requirements:

- the United States Coast Guard (Coast Guard) must be notified when the dredging operations start and end (under the Nationwide Permit 38 issued by the U.S. Army Corps of Engineers),
- any vessel and the crew used for the project must be licensed by the Coast Guard, and
- the Contractor must contact the Coast Guard's VTS (Vessel Traffic Service) before barges leave the dredging site and while they are in route to ensure that their movement is coordinated with this system.

In addition, the dredging contract will require spillage prevention and cleanup measures to be identified in the Contractor's Dredging and Disposal Plan.

If the barge were to capsize and the contents deposited into surface waters, all pertinent state and federal agencies would be immediately notified.

Alternatives Comparison

Same as Section 4.3 Alternatives Comparison, above.

4.7 CULTURAL/ARCHAEOLOGICAL IMPACTS

Neither adverse nor beneficial cultural/archaeological impacts, either shoreside or in the marine environment, are anticipated under any of the alternatives.

The project manager and the Panel have reviewed this project under the National Historic Preservation Act (16 USC 470 et seq.) and Executive Order 12898, Environmental Justice, and determined that no historical or cultural resources are affected by this project. The Washington State Historic Preservation Officer stated that

the project will have no effect upon cultural properties included in the National and State Registers of Historic Places and the Washington State Archaeological and Historic Sites Inventories (Letter, March 13, 2003. See Appendix 9.1).

4.8 TRANSPORTATION

Preferred Alternative

BARGE. Marine recreational, fishing, and other vessels will be minimally affected because the project will comply with all maritime regulations regarding the navigation channel. There may be some additional short-term impacts to vessels as the barges transport sediments to and from the site. Barging activities will have no effect on rail or road transportation. No long-term transportation impacts would be expected as a result of barge activities.

RAIL. Transportation of the sediment by rail should have minimal impacts on rail transportation since the railroad will have made arrangements to accommodate this activity in advance.

TRUCK. Trucks could be used to transport hazardous material encountered. The maximum amount of such material expected is about one barge-load, which would require about 88 one-way truck trips.

The expected increase in traffic would be small and temporary. The truck transportation route would be limited to interstate highways to the maximum extent possible. The *zone of influence* (WSDOT 2001) is defined as the road corridor, including the project area, where traffic impacts may occur. No long-term effect is expected to result from the truck transportation within this zone of influence, as truck traffic would cease as soon the project is complete.

The potential short-term effects of truck transportation activities include an accidental spill of contaminated dredge material, and a possible temporary increase in traffic congestion. A spill is considered unlikely because the trucks would be driven by professional drivers. The modest number of truck trips and relatively easy access to freeways from the loading facility makes the likelihood of an increase in traffic congestion low. The risk of these effects would be confined to the time period required for project implementation.

Alternatives Comparison

Because Alternative 1, No Action, would leave all of the contaminated sediment in place, it would have no transportation impacts. The transportation impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2's transportation impacts would be of smaller magnitude than those of the

preferred alternative because Alternative 2 would involve transportation of less sediment. Alternative 4's transportation impacts would be greater than those of the preferred alternative because Alternative 4 would require transportation of more sediment.

4.9 RECREATION

Preferred Alternative

The proposed project will temporarily render portions of the River unavailable to boaters and fishers during dredging; however, there is limited recreational boating from November to March (when the dredging is scheduled).

Long-term adverse impacts to recreation, either shoreside or in the marine environment, are not expected. Conversely, the project could provide long-term beneficial impacts by improving fish habitat and thus improving recreational fisheries.

Alternatives Comparison

Alternative 1, No Action, would have no short-term recreational impacts but could have the greatest long-term recreational impacts of all of the alternatives if it adversely affected the availability of fish to fishers. The recreational impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2's short-term construction-related recreational impacts would be less than those of the preferred alternative because project activities wouldn't take as long under Alternative 2. Alternative 2's long-term recreational impacts could be greater because this alternative would leave more contaminated sediment in place, which could adversely affect the availability of fish. Alternative 4's short-term construction-related recreational impacts would be greater than those of the preferred alternative because project activities in the River would take longer. Alternative 4's long-term recreational impacts could be less because this alternative would leave less contaminated sediment in place to potentially adversely affect the availability of fish. Beneficial impacts on recreation could increase from Alternative 1 through 4, with increasing amounts of contaminated sediment removal, leading to greater fish habitat improvement and thus improved recreational fisheries.

4.10 LAND USE

Land use is not expected to be changed by the proposed action under any of the alternatives.

4.11 ECONOMICS

The proposed project is not expected to adversely impact the local economy under any of the alternatives, other than the short-term employment of the contractors performing the work and the oversight responsibilities of King County and the Panel for this project. There appears to be no indication that the remediation of this site will adversely affect the businesses or business opportunities in the area.

There are no communities that would be displaced by this project. The Muckleshoot Indian Tribe relies on the natural resources of the lower Duwamish River for its usual and accustomed treaty fishing rights. The project manager will coordinate with the Tribe during the construction period.

4.12 AESTHETICS

Preferred Alternative

The project will involve the use of dredging equipment. During construction, the equipment will be visible from both sides of the River. The Duwamish River is used for navigation and recreational and tribal fishing. This may temporarily alter or obstruct views of boaters using the channel during the winter of 2003 to 2004. No long-term impacts are expected as a result of the proposed dredge project.

Alternatives Comparison

Alternative 1, No Action, would have no short-term aesthetic impacts. The aesthetic impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2 would have less short-term aesthetic impact than the preferred alternative because project activities on the River would take less time. Alternative 4 would have greater short-term aesthetic impact because project activities on the River would require longer work period. No long-term aesthetic impacts would occur under any of the alternatives.

4.13 NOISE

Preferred Alternative

Construction will have short-term impacts on noise levels in the project vicinity. Dredging and offloading equipment will generate noise levels around 75 to 85 dBA at a distance of 50 feet and this activity will typically occur during daylight hours while the dredging is occurring. However, given the location of the project in an industrial area, it is unlikely that there will be any noticeable change in noise levels at any location where sensitive receptors might be located.

The project is expected to comply with the Seattle Noise Control Ordinance, which places limits on noise impacts to adjacent properties based on the zoning of those properties.

Alternatives Comparison

Alternative 1, No Action, would have no short-term noise impacts. The noise impacts of Alternatives 2 and 4 would be of the same type as those of the preferred alternative. Alternative 2 would have less short-term noise impact than the preferred alternative because project activities on the River wouldn't take as long. Alternative 4 would have greater short-term noise impact because project activities on the River would take longer. No long-term noise impacts would occur under any of the alternatives.

4.14 CONNECTED ACTIONS and 4.15 CUMULATIVE IMPACTS

Four lower Duwamish River sediment dredging projects (described below) may occur in the same season and area as the Duwamish/Diagonal Sediment Remediation project. Three of these projects are sediment cleanup projects (Boeing Plant 2 and Lockheed dredging and piling removal), and one is a maintenance dredging project (Turning Basin #3). These federally-regulated projects will be independently evaluated for impacts on listed species and their habitats by the sponsoring agency and were not required to be evaluated in the BA written for this project. No other projects are known to be occurring in the project area during the proposed project work period.

Boeing Plant 2. Dredging for PCB removal. The site is located upstream of the proposed project area on the east side of the River.

Pacific Sound Resources. This is a project to cap contaminated sediments located northeast of the mouth of the West Waterway. The capping material would be sediment obtained from the Corps' Turning Basin #3 maintenance dredging.

Lockheed dredging and piling removal project. Dredging for PCB removal. The site is located on the east side of the West Waterway, on the west side of Harbor Island. Approximately 47,000 cy of contaminated sediment will be dredged, and 6,000 pilings will be removed at this site (U.S. EPA 2002).

Turning Basin #3. The Corps will conduct regular bi-annual maintenance dredging at Turning Basin #3, located in the Duwamish River at river mile 5.2. The material could be used as part of the cap for the project. This dredging typically produces up to 100,000 cubic yards of material (EBDRP 2002a). However, the Corps estimates that the volume of material produced in 2004 will only be about 40,000 to 60,000 cubic yards (Hiltner, 2003).

Even if these projects were to occur at the same time as the Duwamish/Diagonal project, their locations are far enough away from the project site that they would not be expected to have any impacts on the project nor would they be expected to be affected by it.

Substantial contaminant source control has already taken place in the areas tributary to the outfalls near the project site. Additional source control will take place in the future. The City of Seattle plans to reduce its one CSO that is tributary to the Diagonal CSO/SD to state standards by 2004. King County has scheduled a project to reduce its one CSO that is tributary to the Diagonal CSO/SD to state standards in 2026. These and other source control activities are described in detail in the project's Source Control Summary addendum to the Cleanup Study Report (EBDRP 2002).

The Duwamish/Diagonal project is designed to restore and enhance fish and wildlife habitat by removing sources of contamination from the sediments. This project will reduce the cumulative adverse impacts of habitat alteration and degradation that have occurred in the Duwamish River by replacing contaminated sediment with clean sediment and providing the marine resources that use these sediments with a cleaner habitat for nesting and foraging.

After completion of this project, along with the other three nearby remediation projects identified in Sec. 4.14 above, this area will see a marked decrease in the amount of contaminated sediment available to adversely impact the natural resources and human usages of the Duwamish River. Taking into consideration the clean sediment, the habitat restoration project across the River from the Duwamish/Diagonal Sediment Remediation project (see Figure 5) and other anticipated estuarine restoration and mitigation projects in this part of the River, the project will have cumulative, beneficial, consequences to the resources.

5. COORDINATION AND CONSULTATION

KEY LAWS AND REGULATIONS

This section presents a review of the potentially applicable laws and regulations that govern cleanup at the Duwamish/Diagonal sediment remediation site. Many federal, state, tribal, and local laws and regulations need to be considered during the development of this project as well as several regulatory requirements that are typically evaluated during the federal and state permitting process. Additionally, there are some state and local programs that address the management of contaminated materials. A brief review of potentially applicable laws and regulations that may pertain to the Duwamish/Diagonal cleanup action is presented below and in the Panel's Concept Document (EBDRP 1994a). The project manager will ensure that there is coordination among these programs where possible and that project implementation and monitoring is in compliance with all applicable laws and regulations.

United States et al. v. City of Seattle and Municipality of Metropolitan Seattle [now King County], Civ. No. C90-395WD (W.D. Wash., Dec. 23, 1991).

The lawsuit, under CERCLA, sought to recover damages to natural resources resulting from releases of hazardous materials discharged from combined sewer overflows and storm drains located in the lower Duwamish River and Elliott Bay. The Duwamish/Diagonal project is being conducted as a sediment remediation project under the Consent Decree. See the Consent Decree and the Concept Document (EBDRP 1994a) for additional information about the program established under the Consent Decree for the planning, design, construction, and implementation of sediment remediation and habitat development projects. Panel projects are not required to be conducted under CERCLA; they may be conducted under Washington State Sediment Management Standards, with WDOE as lead agency.

Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 USC §§ 9601 et seq., and National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR 300.

CERCLA, also known as Superfund, provides the basic legal framework for cleanup and restoration of the nation's hazardous substances sites. CERCLA establishes a hazard ranking system for assessing the nation's contaminated sites with the most contaminated sites being placed on the National Priorities List (NPL). The Duwamish/Diagonal site, part of the Lower Duwamish Waterway, was placed on the NPL on September 13, 2001 (66 Fed. Reg. 47583) and a remedial investigation of Lower Duwamish Waterway is underway.

The Duwamish/Diagonal project was selected as a Panel project in 1993 (Res. 1993-20) and studies on cleanup techniques and alternatives for the site have been underway for several years. This Panel project shall be implemented in consultation with the EPA and the WDOE to ensure consistency with the overall Lower Duwamish Waterway CERCLA cleanup.

Model Toxics Control Act (MTCA), Ch. 70.105D RCW (1989) and Ch. 173-340 WAC (1992).

MTCA, Washington's toxic cleanup law, mandates that site cleanups protect the state's citizens and the environment. The statewide regulations establish cleanup standards and requirements for managing contaminated sites. MTCA is the state equivalent of the federal Superfund program and managed by WDOE. WDOE is a participant in this project so MTCA compliance will be inherent in the Panel's decision making process. Because this project is being carried out under MTCA, WDOE is the lead agency and provided the Cleanup Action Decision document that approved the project.

National Environmental Policy Act (NEPA), as amended, 42 U.S.C. §§ 4321 et seq.; 40 C.F.R. Parts 1500-1508.

NEPA was enacted in 1969 to establish a national policy for the protection of the environment. The Council on Environmental Quality (CEQ) was established to advise the President and to carry out certain other responsibilities relating to implementation of NEPA by federal agencies. Pursuant to Presidential Executive Order, federal agencies are obligated to comply with NEPA regulations adopted by the CEQ (40 CFR Parts 1500-1508). These regulations outline the responsibilities of federal agencies under NEPA and provide specific procedures for preparing environmental documentation to comply with NEPA. NEPA requires that an EA be prepared in order to determine whether the proposed action will have a significant effect on the quality of the human environment. The Draft EA for this project was reviewed informally by the public through a comment period and then the federal agency, in this case, NOAA, will make a final recommendation. Depending on whether an impact is considered significant, an environmental impact statement (EIS) or a Finding of No Significant Impact (FONSI) will be made prior to implementation of the project. The EA, the appropriate regulatory documents, and the public comments will become a part of the administrative record for this project.

State Environmental Policy Act (SEPA), Chapter 43.21C RCW and Chapter 197-11 WAC.

SEPA sets forth the state's policy for protection and preservation of the natural environment. Local jurisdictions must also implement the policies and procedures of SEPA. The project has undergone a public comment period under SEPA requirements and the SEPA checklist, applications for permits, permits, and the public comments will become a part of the administrative record for this project. King County, the SEPA lead agency, has made a SEPA threshold determination of nonsignificance for the Duwamish/Diagonal project.

Clean Water Act (CWA)(Federal Water Pollution Control Act), 33 U.S.C. §§ 1251 et seq.

The CWA is the principal law governing pollution control and water quality of the nation's waterways. It requires the establishment of guidelines and standards to control the direct or indirect discharge of pollutants to waters of the United States. Discharges of material into navigable waters are regulated under Sections 401 and 404 of the CWA. The Corps has the primary responsibility for administering the Section 404 permit program. Under Section 401 of the CWA, projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards. The Duwamish/Diagonal project is anticipated to require 404/401 permit and certification or a nationwide permit.

Rivers and Harbors Act, 33 U.S.C. §§ 401 et seq.

This Act regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and vests the Corps with authority to regulate discharges of fill and other materials into such waters. Actions that require Section 404 CWA permits are also likely to require permits under Section 10 of this Act. A single permit usually serves for both purposes so this project can potentially ensure compliance through this mechanism.

Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531 §§ et seq., 50 C.F.R. Parts 17, 222, 224.

The ESA directs all federal agencies to conserve endangered and threatened species and their habitats and encourages such agencies to utilize their authorities to further these purposes. Under the Act, NOAA, through NMFS, and the Department of the Interior, through the USFWS, publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies consult with these agencies to minimize the effects of federal actions on endangered and threatened species.

The Biological Assessment/Opinion for the Duwamish/Diagonal project, attached in Appendix 9.1, provides additional information regarding the federal- and state-listed endangered and threatened species that either migrate or reside in the Duwamish River. The regulatory permits and consultation conditions will set forth a number of operating measures designed to prevent or mitigate any such disturbances to these species.

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 U.S.C. §§ 1801 et seq., 50 C.F.R. Part 600.

In 1996, the Act was reauthorized and changed by amendments to require that fisheries be managed at maximum sustainable levels and that new approaches be taken in habitat conservation. This habitat is called essential fish habitat (EFH), defined broadly to include "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity " (62 Fed. Reg. 66551, § 600.10 Definitions). The Act requires consultation for all federal agency actions that may adversely affect EFH. Under Section 305(b)(4) of the Act, NMFS is required to provide advisory EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Where federal agency actions are subject to ESA Section 7 consultations, such consultations will be combined to accommodate the substantive requirements of both ESA and MSFCMA. During the permitting process, NMFS will be consulted regarding any MSFCMA-managed species residing or migrating through the Duwamish Waterway.

Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. §§ 661 *et seq.* , Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703 *et seq.*)

The FWCA requires that federal agencies consult with the USFWS, NMFS, and state wildlife agencies for activities that affect, control, or modify waters of any stream or bodies of water, in order to minimize the adverse impacts of such actions on fish and wildlife resources and habitat. Similarly, the Migratory Bird Treaty Act requires the protection of ecosystems of special importance to migratory birds against detrimental alteration, pollution, and other environmental degradation. These consultations are generally incorporated into Section 404 of the CWA, NEPA, or other federal permit, license or review requirements.

Executive Order (EO) 12898: Environmental Justice, as amended

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This EO requires each federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low income populations. EPA and CEQ have emphasized the importance of incorporating environmental justice review in the analyses conducted by federal agencies under NEPA and of developing mitigation measures that avoid disproportionate environmental effects on minority and low-income populations.

The Muckleshoot Indian Tribe and the Suquamish Tribe constitute distinct, separate communities of Native Americans who rely on Treaty-reserved fish and shellfish resources for subsistence, economic, and spiritual purposes (Treaty of Point Elliott, 1855. S. Doc 319, 58-2, vol. 2:43). Other members of low-income communities may rely on fishery resources for subsistence purposes. The Trustees have not identified any disproportionate, adverse impacts on human health or environmental effects on implementation of the preferred alternative on Native Americans or other minority or low income populations and believe that this project will be beneficial to these communities. The Tribes are participants in the project planning and their representation will be inherent in the Panel's decision making process.

Other potentially applicable federal, state, tribal, and local laws that are integrated into the regulatory process include:

Archaeological Resources Protection Act, 16 U.S.C. §§ 470, *et seq.*
Clean Air Act, 42 U.S.C. §§ 7401, *et seq.*
Information Quality Act, Public Law 106-554 § 515(a).
Marine Mammal Protection Act, 16 U.S.C. §§ 1361 *et seq.*
National Historic Preservation Act, 16 U.S.C. §§ 470 *et seq.*
Treaty of Point Elliott, 1855. S. Doc 319, 58-2, vol. 2:43
Shoreline Management Act, Ch. 90.58 RCW and Ch. 173-14 WAC
Historic Preservation Act, Ch. 27.34 RCW, Ch. 27.44 RCW, and Ch. 27.53 RCW

6. BUDGET

The project budget is \$8,932,653. This budget was authorized in Elliott Bay/Duwamish Restoration Program Panel Resolution 2002-07, adopted on October 3, 2002. Previous Panel resolutions related to the project were:

Resolution Number and Description

1993-11	Designating Manager of Sediment Remediation Projects
1993-20	Site Selection, Development of Cleanup Study Workplans

- 1995-20 Attachment 1, Scope of Work, Environmental Services for
Duwamish/Diagonal and Norfolk Sediment Remediation Projects
1997-14 Management Plan and Scope/Schedule/Budget

7. LIST OF PERSONS AND AGENCIES CONSULTED

7.1 PANEL MEMBERS

U.S. Fish and Wildlife Service - Curtis Tanner
National Oceanic and Atmospheric Administration - Robert Clark, Alexandra Von
Saunders, Gail Siani, Robert Taylor, Michelle DeBlasi
Muckleshoot Indian Tribe - Glen St. Amant
Suquamish Tribe – Richard Brooks
King County Department of Natural Resources and Parks - Jeffrey Stern

7.2 OTHER PERSONS/AGENCIES

King County Department of Natural Resources and Parks - Pat Romberg

8. REFERENCES AND LIST OF DOCUMENTS INCORPORATED BY REFERENCE

8.1 PROJECT DOCUMENTS

EBDRP. 1994a. Concept Document. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1994b. Duwamish/Diagonal Cleanup Study Workplan. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1994c. Duwamish/Diagonal Sampling and Analysis Plan. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1994d. Duwamish/Diagonal and Norfolk Health and Safety Plan. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1994e (Updated April 2002). Duwamish/Diagonal Public Participation Plan. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/ Duwamish Restoration Panel, Seattle WA.

EBDRP. 1995. Duwamish/Diagonal Sampling and Analysis Plan, Pre-Phase II Addendum. Prepared by King County Department of Metropolitan Services (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1996a. Duwamish/Diagonal Phase II Sampling and Analysis Plan. Prepared by King County Department of Natural Resources (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1996b. Duwamish/Diagonal Phase II Health and Safety Plan. Prepared by King County Department of Natural Resources (now KCDNRP) for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP. 1997. Draft Duwamish/Diagonal Site Assessment Report. Prepared by King County Department of Natural Resources (now KCDNRP) and EcoChem Team for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

EBDRP 2001. Draft Duwamish/Diagonal CSO/SD Cleanup Study Report. Prepared by King County Department of Natural Resources (now King County Department of Natural Resources and Parks) and EcoChem Team for the Elliott Bay/Duwamish Restoration Panel, Seattle WA. Panel Publication 30.

EBDRP 2002. Final Cleanup Study Report. Consists of the Draft Cleanup Study Report (Panel Publ. 30, December 2001) and three addenda: "Expanded Area for the Duwamish Diagonal Cleanup Project" (April 2002), "Source Control Summary for the Duwamish Diagonal Cleanup Project" (April 2002) and "Responses to Reviewer Comments on the Draft Cleanup Study Report" (April 2002).

EBDRP 2002a. Draft Duwamish/Diagonal CSO/SD Engineering Design Report. Prepared by King County Department of Natural Resources and Parks and Anchor Environmental, L.L.C. for the Elliott Bay/Duwamish Restoration Panel, Seattle WA.

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8.3 LIST OF PERMITS

SEPA Threshold Determination: King County issued a SEPA Determination of Nonsignificance (DNS) for this project on May 6, 2002.

Agency Consultations. A Biological Assessment has been prepared for the project. The U.S. Fish and Wildlife Service and National Marine Fisheries Service issued a Biological Opinion and Essential Fish Habitat Consultation for the project on March 17, 2003. The Office of Archaeology and Historic Preservation issued its consultation letter on March 13, 2003.

Right of Entry. The Port of Seattle is responsible for issuing a Right of Entry permit for the project. Pending.

Joint Aquatic Resource Permits Application (JARPA) . The following permits were applied for by the King County in the JARPA form.

Permit	Issuing agency	Status
Nationwide Permit 38	US Army Corps of Engineers	Issued 06/19/03
State of Washington Hydraulic Project Approval	WDFW	Issued 04/07/03
Shoreline Substantial Development Exemption	City of Seattle	Project determined exempt, 11/5/02
Section 401 Certification	WDOE	Project determined exempt from procedural requirements

9. APPENDICES

9.1 AGENCY CONSULTATION

9.2 LIST OF EVALUATION CRITERIA

CERCLA:

1. Extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses,
2. Cost to carry out the alternative,
3. Likelihood of success of each alternative,
2. Extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative,
3. Extent to which each alternative benefits more than one natural resource and/or service, and
6. Effect of each alternative on public health and safety.

EB/DRP CONCEPT DOCUMENT:

1. Presence of contaminants at concentrations that exceeded Washington State Cleanup Screening Levels
2. Adequate control of sewer overflows, storm drains, and industrial input to prevent recontamination;
3. Potential for addressing injury to target species/fish;
4. Potential for incorporating additional habitat improvement measures or proximity to other habitat restoration or sediment remediation sites;
5. Potential for risk to human health;
6. Potential for public education projects;
7. Potential for coordination with other projects.

NEPA FACTORS (40 CFR § 1508.27):

1. Likely impacts of the proposed projects;
2. Likely effects of the projects on public health and safety;
3. Unique characteristics of the geographic area in which the projects are to be implemented;
4. Controversial aspects of the project or its likely effects on the human environment;
5. Degree to which possible effects of implementing the project are highly uncertain or involve unknown risks;
6. Precedential effect of the project on future actions that may significantly affect the human environment;

7. Possible significance of cumulative impacts from implementing this and other similar projects;
8. Effects of the project on National Historic Places, or likely impacts to significant cultural, scientific or historic resources;
9. Degree to which the project may adversely affect endangered or threatened species or their critical habitat; and
10. Likely violations of environmental protection laws.

9.3 ACRONYMS

CORPS	US Army Corps of Engineers
CSL	Cleanup Screening Level
CSO	combined sewer overflows
cy	cubic yards
EA	Environmental Assessment
EBDRP	Elliott Bay/Duwamish Restoration Program Panel
EPA	U.S. Environmental Protection Agency
MCUL	Minimum Cleanup Level
MLLW	Mean Lower Low Water
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PPM	parts per million
Panel	Elliott Bay/Duwamish Restoration Program Panel
Program	Elliott Bay/Duwamish Restoration Program
SEPA	State Environmental Policy Act
SMS	State of Washington Sediment Management Standards
SQS	State Sediment Quality Standards
VTs	Coast Guard's Vessel Traffic Service

9.4 Figures

Figure 1.	Vicinity Map
Figure 2.	Aerial photograph of project site.
Figure 3.	Locations of PCB Hot Spots and Stormwater and Sewage Outfalls in Cleanup Areas A and B
Figure 4.	Site Boundaries, Slopes, and Distribution of Capping Materials
Figure 5.	Elliott Bay/Duwamish River Restoration Projects.

9.5 Table