

**Supplemental Section 404(b)(1) Evaluation
Terminal 4 Phase I Removal Action
Port of Portland, Portland, Oregon
Contract No. 68-S7-03-04
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Prepared for

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Prepared by

Parametrix
1231 Fryar Avenue
Sumner, WA 98390-1516
253-863-5128
www.parametrix.com

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ACRONYMS

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
ARCS	Assessment and Remediation of Contaminated Sediments
BA	Biological Assessment
BBL	Blasland, Bouck and Lee, Inc.
CDF	confined disposal facility
CERCLA	Compensation and Liability Act of 1980
CST	column settling test
cy	cubic yards
DAR	Design Analysis Report
DDD	dichlorodiphenyldichloroethane
DDT	dichlorodiphenyltrichloroethane
EE/CA	Engineering Evaluation and Cost Analysis
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
ISE	imminent and substantial endangerment
NMFS	U.S. National Marine Fisheries Service
NTCRA	Non-Time-Critical Removal Action
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PEC	probable effects concentration
Port	Port of Portland
psf	pounds per square foot
RAA	Removal Action Area
RAOs	Removal Action Objectives
RAWP	Removal Action Work Plan
RI/FS	remedial investigation/feasibility study
SEA	Striplin Environmental Associates, Inc.
T4 or Site	Terminal 4 Site
TSS	total suspended sediments
USACE	U.S. Army Corps of Engineers

ACRONYMS (CONTINUED)

USEPA

U.S. Environmental Protection Agency

USGS

U.S. Geological Survey

WQMCCP

Water Quality Monitoring and Compliance Conditions Plan

1. INTRODUCTION

This evaluation was prepared in accordance with guidelines promulgated by the Environmental Protection Agency at 40 CFR 230 for evaluating discharges of dredged or fill material in the waters of the United States. Its purpose is to support decisions by the U.S. Environmental Protection Agency, Region 10, (USEPA) regarding a Non-Time-Critical Removal Action (NTCRA) at the Terminal 4 Site (T4 or Site) (USEPA 2003b), under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended. This supplemental evaluation will be included as part of the administrative record.

The Port of Portland (Port) owns the T4 uplands located between River Miles 4.1 and 4.5 on the Lower Willamette River, extending west from the ordinary high water line on the northeast bank of the Lower Willamette River to the edge of the navigation channel, and extending south from the downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay. The remainder of submersible or submerged land within the Removal Action Area (RAA) is owned by the State of Oregon Department of State Lands. T4 is currently used as an operating marine facility with a variety of tenants and operations, including automobile importing, exporting of soda ash, import and export of dry and liquid bulk cargo, associated rail intermodal facilities, and associated petroleum storage. Historically, activities at Slip 3 included loading and unloading dry and liquid bulk cargo such as Bunker C, diesel, pencil pitch, and metal ores. Slip 1 has been used for bulk and break-bulk cargo loading and unloading operations handling liquid fertilizer, lead and zinc concentrates, cured meats, agricultural produce, flour, vegetable oils, molasses, tallow, caustic soda, and a variety of general cargoes.

An Engineering Evaluation and Cost Analysis (EE/CA) Report (BBL 2005) presented the Site conceptual model, identified Removal Action Objectives (RAOs) and Applicable or Relevant and Appropriate Requirements (ARARs), screened remedial action technologies, and evaluated and ranked removal action alternatives. Appendix Q of the EE/CA was a Draft CWA 404(b)(1) analysis memorandum specifically addressing Alternative C, the selected action. This document supplements but does not alter that initial analysis or its conditions as discussed below.

As part of the collaborative resolution process for design of the T4 Removal Action, it was determined that many of the design issues are linked to the overall harbor-wide remedial investigation/feasibility study (RI/FS) process. For this reason, the Parties agreed to revise the schedule for implementation of the T4 Removal Action to realign the project with the harbor-wide RI/FS schedule.

As a condition of the approval of the schedule realignment, USEPA is requiring the Port to implement an abatement action during the 2008 in-water work window to reduce risks present at the T4 Site (USEPA 2007). Essentially, this action results in the division of the Removal Action project into two phases. Phase I (the abatement action) is planned for the 2008 in-water work window and encompasses abatement measures that could be initiated in the near term to reduce risk at T4. Phase II (including construction of the confined disposal facility [CDF]) will commence once the project is realigned with the harbor-wide RI/FS process. The Port submitted an Abatement Measures Proposal (Phase I remedy) in October 2007 (Anchor 2007a) which was accepted by EPA. A Design Analysis Report (DAR) and Remedial Action Work Plan for the Phase I work have been prepared and submitted to EPA for review and approval.

The objectives of this Phase I of the Removal Action include reducing ecological and human health risks associated with sediment contamination within the RAA pending the completion of the Removal Action selected in the Action Memorandum (USEPA 2006a). Because the Phase I Removal Action is not the complete Removal Action, and a long-term Remedial Action for the Portland Harbor Superfund Site is contemplated, this Phase I Removal Action is not intended to address all exposure pathways and environmental media within the RAA.

As described in Appendix Q of the EE/CA (Draft CWA Section 404[b][1] Analysis Memorandum), the Alternative C, including CDF disposal option, was determined to be an acceptable dredge and fill project consistent with the Clean Water Act for placement of fill in aquatic environments. The CDF would result in loss of aquatic habitat in Slip 1, but with the completion of adequate compensatory mitigation, no net loss of habitat quality and function will occur. Some temporal loss of habitat or function will result from dredging and capping areas, which will require appropriate mitigation.

A final approved mitigation plan was required by the EE/CA to be completed prior to any loss of existing habitat for the full T4 removal action. As part of the conceptual plan proposal for the mitigation project in the EE/CA, the overall objective for the mitigation project, as well as specific, quantitative performance standards for both the construction and long-term monitoring of the mitigation project must be established in development of the final, approved mitigation plan.

Compensatory mitigation plans were to be developed pursuant to the performance criteria (preliminary criteria were identified) and in consultation with EPA and resource agencies, and be submitted to and approved by EPA during the Removal Action Design.

EPA reserves the right to consider mitigation proposals that do not meet all of the performance criteria if the Port demonstrates that the proposal otherwise contributes to conservation and recovery of ESA listed species and/or other relevant conservation initiatives for the Lower Willamette River basin. These conditions have not yet been satisfied and remain outstanding. Accordingly, EPA's finding of compliance with the CWA 404 ARAR remains preliminary and conditional.

This supplemental evaluation focuses specifically on the Phase I abatement measures at this time. When considered in context with the expected implementation of the Phase II T4 Removal Action and overall Portland Harbor RI/FS process, the abatement measures for this Phase I Removal Action only partially implement the elements of Alternative C selected in the EE/CA. The Wheeler Bay shoreline stabilization is being implemented as a source control action to limit release of contaminants (PAHs, cadmium, copper, selenium, zinc, and dichlorodiphenyltrichloroethane [DDT] above screening levels for human or ecological receptors) that are present in shoreline bank soils. The proposed stabilization design calls for placing riprap between elevation +10 and +15 feet NGVD29 datum. NMFS has determined that the area is important habitat and that placement of riprap will have an adverse affect on existing habitat, and therefore is requiring mitigation. NMFS, the Port, and EPA have agreed to the following to define the mitigation required for the Phase I Removal Action:

“The Port will plan, carry out, and manage compensatory mitigation activities using performance standards and criteria described in 40 CFR Part 230 to compensate for the degradation or loss of 0.33 acres of shallow-water habitat and other aquatic resources that will be adversely affected by the proposed removal action. Among other things, the compensatory mitigation plan will be based on (1) measurable, enforceable, ecological performance standards, including a mitigation ratio of 1.5-to-one to offset resource losses due to the time lag between permitted impacts and completion of the compensatory mitigation actions; (2) regular monitoring to ensure completion; (3) assurances of long-term protection

of compensation sites; (4) financial assurances; and (5) identification of the parties responsible for specific project tasks. The Port will submit this Plan to NMFS and EPA for approval or disapproval within 2 years of the start of Phase I, and complete all actions necessary to mitigate the adverse effects of operations within 5 years of the start of Phase I.”

The Port is also placing sand and gravel over the riprap surface of the Wheeler Bay bank stabilization and cap to create a more natural habitat. The Port recognizes that the long-term viability of sand placement over a riprap surface depends on site-specific conditions such as wave action, the shape of the shoreline, nearby river activities, and river dynamics. The Port is placing the sand at this location because the Wheeler Bay conditions may be conducive to sand staying in place. During design of Phase II EPA and NMFS will likely assess additional mitigation needs for the Terminal 4 project.

2. DESCRIPTION OF THE PROPOSED DISCHARGE

As a condition of the approval of the schedule realignment, USEPA is requiring the Port to implement an abatement action during the 2008 in-water work window to reduce risks present at the T4 Site. Essentially, this action results in the division of the Removal Action project into two phases. Phase I (the abatement action) is planned for the 2008 in-water work window and encompasses abatement measures that could be initiated in the near term to reduce risk at T4. Phase II (including construction of the CDF) will commence once the project is realigned with the harbor-wide RI/FS process.

Phase I of the Removal Action includes the following components:

- Dredging and off-site disposal of sediment exhibiting the highest chemical concentration, providing a permanent solution of contaminant mass removal.
- Construction of a nearshore cap to isolate petroleum-contaminated sediments from aquatic receptors and control a potential ongoing discharge source to nearby areas.
- Stabilization of the Wheeler Bay bank to minimize contaminant migration to the river.
- Dredging and off-site disposal of contaminated sediments in Slip 3 at Berth 410 to support water-dependent maritime use in a manner consistent with the Action Memo (USEPA 2006a) and in support of overall risk reduction in the RAA.

The DAR presents the design details, and the Removal Action Work Plan (RAWP) presents detailed construction activities approved by EPA for the Phase I abatement remedy.

2.1 NEED FOR DISCHARGE

Actual or threatened releases of hazardous substances from the T4 Site, if not addressed, represent an imminent and substantial endangerment to public health, welfare, or the environment. These hazardous substances have contaminated adjacent sediments in the Willamette River. The general purpose of the Phase I activities is to remove material with the highest surface sediment probable effects concentration (PEC) exceedance ratios (greater than 20 times the PEC) in the Berth 411 Plus dredging areas, isolate petroleum-contaminated sediment at the head of Slip 3, remove a potential future contaminant source to sediments along the Wheeler Bay shoreline, and eliminate a navigational impediment at Berth 410 in a manner that is consistent with USEPA's Action Memo.

After there was agreement on realigning the overall Removal Action and completing a Phase I Removal Action in 2008, the Port and USEPA management teams discussed what specific abatement measures should be scoped in Phase I, and agreed that the measures should address the following objectives:

- Proposed measures should be partially effective in abating imminent and substantial endangerment (ISE) posed to aquatic life that may have direct contact with sediments within the RAA.
- Proposed measures should be consistent with USEPA's selected Removal Action (i.e., CDF in Slip 1).

- Proposed measures should not unduly impede or disrupt the designated use of T4 for water-dependent maritime use.
- Proposed measures should be consistent with sediment management activities that will be required at T4 to continue ongoing water dependent maritime use (e.g., maintenance dredging).

The abatement measures that meet these objectives and are part of the Phase I project include:

- Removal of material with the highest surface sediment PEC exceedance ratios (greater than 20 times the PEC) in Slip 3 and north of Berth 414. This removal work is referred to as the Berth 411 “Plus” dredging.
- Removal of sediment along Berth 410/411 to eliminate navigational impediments consistent with USEPA’s Action Memo (USEPA 2006a). This removal work is referred to as the Berth 410 dredging.
- Placement of a cap at the head of Slip 3 to address petroleum-contaminated sediment.
- Stabilization of the shoreline at Wheeler Bay.

These Phase I abatement measures will meet the objectives by:

- Dredging and off-site disposal of sediments exhibiting the highest surficial chemical concentrations.
- Dredging and off-site disposal of contaminated sediments in Slip 3 at Berth 410 to support water-dependent maritime use in a manner consistent with the Action Memo and in support of overall risk reduction in the RAA.
- Constructing a nearshore cap to isolate petroleum-contaminated sediments from aquatic receptors and control a potential ongoing source to nearby areas.
- Stabilizing the bank to minimize contaminant migration to the river.

All sediments dredged from Slip 3 will be loaded onto haul barges for transporting and disposal at the Subtitle D Wasco County Landfill facility in The Dalles, Oregon. Details of the dredged material dewatering, rehandling, and transportation from the dredging site to the ultimate repository are contained in the approved RAWP. Generally, the dredged material will be hauled down the Willamette River, then up the Columbia River to the Port of The Dalles. At the Port, construction equipment will transfer the sediment to trucks or rail cars for transport to the landfill. No return-water discharge back to waters of the United States from the transfer process is authorized.

2.2 LOCATION

The T4 facility itself is within the Portland Harbor Superfund Site. The RAA is defined in the AOC as “that portion of the site adjacent to and within the Port of Portland’s T4 at 11040 North Lombard, Portland, Multnomah County, Oregon, extending west from the ordinary high water line on the northeast bank of the Lower Willamette River to the edge of the navigation channel, and extending south from the downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay.” A vicinity map and site plan locating T4 are provided in Figure 1 of the DAR.

2.3 DESCRIPTION OF THE DISCHARGE SITE

The Port of Portland (Port) owns the T4 uplands located between River Miles 4.1 and 4.5 on the Lower Willamette River, extending west from the ordinary high water line on the northeast bank of the Lower Willamette River to the edge of the navigation channel, and extending south from the downstream end of Berth 414 to the downstream end of Berth 401, including Slip 1, Slip 3, and Wheeler Bay. The remainder of submersible or submerged land within the Removal Action Area (RAA) is owned by the State of Oregon Department of State Lands. T4 is currently used as an operating marine facility with a variety of tenants and operations, including automobile importing, exporting of soda ash, import and export of dry and liquid bulk cargo, associated rail intermodal facilities, and associated petroleum storage. Historically, activities at Slip 3 included loading and unloading dry and liquid bulk cargo such as Bunker C, diesel, pencil pitch, and metal ores. Slip 1 has been used for bulk and break-bulk cargo loading and unloading operations handling liquid fertilizer, lead and zinc concentrates, cured meats, agricultural produce, flour, vegetable oils, molasses, tallow, caustic soda, and a variety of general cargoes.

2.4 METHOD OF DISCHARGE

Discharges will occur directly (e.g., through placement of capping material and slope riprap) and indirectly (e.g., minimal release of incidental fallback from dredging, erosion of material placed for slope stabilization). No overflow from barges is allowed.

2.5 TIMING OF DISCHARGE

To minimize effects to juvenile salmonids, dredging shall be limited to the summer in-water work window (July 1 through October 31).

2.6 GENERAL CHARACTERISTICS OF MATERIAL

A number of sources of existing sediment chemistry data for T4 are available from historical investigations of sediment contamination. The Port has been investigating the nature and extent of sediment contamination at T4 since before 1988. Other organizations, including USACE, USEPA, and DEQ, have investigated the nature and extent of sediment contamination in the Willamette River and have collected sediment samples in the vicinity of T4 as part of their investigations (BBL 2004a).

Most recently, sediment chemistry data were collected as part of the T4 Early Action design. Laboratory tests show that the recently deposited sediments overlying the grey, loose-to-medium dense sands consist predominantly of very soft organic silt and clay with liquid limits ranging from about 70 percent to nearly 100 percent and moisture contents ranging from 67 percent to 106 percent. The fines content of these sediments generally ranges from 51 percent to 96 percent, with average fines content ranging from 75 percent to 85 percent. Based on consolidation and plasticity results, as well as on testing conducted in the field (including pocket penetrometer tests, torvane tests, and standard penetration resistance), it is expected that these soils are normally consolidated and have very low undrained shear strengths. The undrained strength of the very soft sediments is estimated to be on the order of about 20 to 140 pounds per square foot (psf).

The material to be dredged in Slip 3 consists of very soft to soft, slightly sandy to sandy organic silt and clay. Areas of higher density sediment may be encountered during dredging. The sediment to be dredged at Berth 414 consists of very soft to soft, clayey, fine sandy silt with occasional wood chunks. In addition, debris is anticipated to be encountered during the dredging.

2.7 QUANTITY OF MATERIAL

Specifications of material removed or placed are contained in the EPA-approved RAWP. Between 8,900 and 16,500 cubic yards (cy) of contaminated sediments will be dredged and removed from the slip. Anticipated volumes of cap and fill material are presented below by area and by material type:

- Head of Slip 3:
 - 600 cy of Base Cap Types 2 and 3.
 - 1,400 cy of Armor Type 3.
- Wheeler Bay Shoreline Stabilization:
 - 1,850 cy of exported cut material.
 - 800 cy of import select fill (beneath the armor layer as filter material).
 - 1,100 cy of Armor Type 3.
 - 600 cy of Habitat Cover.

2.8 SOURCE OF MATERIAL

Sources for capping and stabilization material will most likely be commercial upland quarries. All materials used in imported material placement will meet the requirements established in the December 2003 Technical Plans and Specifications (Ecology and the Environment 2003) for the McCormick & Baxter sediment cap located within the Willamette River.

The Construction Specifications (Appendix E) present both physical and chemical parameters for the imported materials. Base cap materials will either be fine-to-medium sand or sandy gravel/gravelly sand depending on the steepness of the area being capped. Steeper areas will require the sand and gravel material. Armor layers are varying sizes of riprap. Import material must meet specified physical and chemical properties, as outlined in the Construction Specifications (Appendix E), prior to being used. Sampling and analysis of materials before and during construction, coupled with visual inspections of import materials, will be completed to verify suitability.

2.9 PROJECTED LIFE OF DISPOSAL SITE

Not applicable. Contaminated sediments will be removed to an as-yet unidentified upland landfill. This Phase I action is considered a one-time event.

3. POTENTIAL IMPACTS ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE AQUATIC ECOSYSTEM

3.1 SUBSTRATE

The discharge is not expected to significantly alter the physical characteristics of the Site. Bottom topography will be altered by the removal of material through dredging (although this area has been periodically maintenance dredged several times in the historic past), presence of the caps (inconsequential mounds) at two locations, and resculpting and stabilization of shorelines within the terminal slip and Wheeler Bay. Long-term change within the slip is expected when the Phase II Removal Action is implemented. The function of the caps is to isolate the underlying chemically contaminated substrate, thereby resulting in improved habitat. Likewise, shoreline stabilization within Wheeler Bay has the potential to improve the habitat potential, particularly when mitigation is implemented.

3.2 SUSPENDED PARTICULATES/TURBIDITY

Turbidity will occur as a result of the proposed project, both from the dredging and the placement of cap and shoreline fill material during construction activities. A supplemental analysis was prepared and submitted to EPA on predicted turbidity, primarily for dredging (Anchor 2008c).

When subjected to a column settling test (CST), T4 sediments showed high levels of residual turbidity even after much of the suspended solids had settled out. T4 sediments appear to color the water, even though elutriate test results indicate the turbidity generated by these sediments is not associated with elevated levels of dissolved contaminants. The nature of this correlation indicates that sediment particles (measured and modeled as total suspended sediments [TSS]) drop out more quickly over time, whereas residual discoloration of the water (expressed as turbidity) may persist even at relatively low TSS concentrations. Elutriate test results indicate that the turbidity generated by these sediments is actually not associated with elevated levels of dissolved contaminants, nor is it associated with suspended solids.

Turbidities associated with capping and shoreline stabilization activities are expected to be localized to the immediate area of construction, and placement areas such as coarse, clean, upland source material (sands and gravels) will be used. Duration and intensity are expected to be brief (5 to 20 minutes).

No violation of water quality standards is anticipated during construction. EPA has prepared a Water Quality Monitoring and Compliance Conditions Plan which specifies points of compliance for the various water quality parameters.

3.3 WATER QUALITY

As described in Section 3.2, significant effects to ambient water quality are not anticipated during construction. These Phase I abatement measures are expected to result in improved water quality at the Site by:

- Dredging (removing) of sediments exhibiting the highest surficial chemical concentrations from the slip.

- Dredging (removal) of other contaminated sediments in Slip 3 at Berth 410 to support water-dependent maritime use in a manner consistent with the Action Memo and in support of overall risk reduction in the RAA.
- Constructing a nearshore cap to isolate petroleum-contaminated sediments from aquatic receptors and control a potential ongoing source to nearby areas.
- Stabilizing the bank to minimize contaminant migration to the river.

3.4 CURRENT PATTERNS AND WATER CIRCULATION

Current patterns and water circulation will not be affected by this action.

3.5 NORMAL WATER FLUCTUATIONS

The action will not substantively affect normal water fluctuations.

3.6 SALINITY GRADIENTS

Not applicable.

4. POTENTIAL IMPACTS ON BIOLOGICAL CHARACTERISTICS OF THE AQUATIC ECOSYSTEM

4.1 THREATENED AND ENDANGERED SPECIES

A Biological Assessment (dated December 2007) was submitted to the U.S. Fish and Wildlife Service (FWS) and U.S. National Marine Fisheries Service (NMFS). By letter dated February 19, 2008, the FWS concurred with the determination that the action “may affect, but is not likely to adversely affect” bull trout. By Technical Memorandum, dated March 4, 2008, supplemental information was provided to NMFS regarding the Biological Assessment (BA) for Phase I of the T4 Removal Action that was submitted in December 2007. The document provided additional information on the following topics:

1. Literature regarding the use of bubble curtains for fish guidance and/or deterrent.
2. Expected contaminant concentrations in the vicinity of the dredging activity.
3. Habitat description and clarification for work to be performed at Wheeler Bay.

The Wheeler Bay shoreline stabilization is being implemented as a source control action to limit release of contaminants (PAHs, cadmium, copper, selenium, zinc, and DDT above screening levels for human or ecological receptors) that are present in shoreline bank soils. NMFS determined that the area is important habitat and that placement of riprap will have an adverse affect on existing habitat, and therefore is requiring mitigation. NMFS, the Port, and EPA have agreed to the following to define the mitigation required for the Phase I removal action:

“The Port will plan, carry out, and manage compensatory mitigation activities using performance standards and criteria described in 40 CFR Part 230 to compensate for the degradation or loss of 0.33 acres of shallow-water habitat and other aquatic resources that will be adversely affected by the proposed removal action. Among other things, the compensatory mitigation plan will be based on (1) measurable, enforceable, ecological performance standards, including a mitigation ratio of 1.5-to-one to offset resource losses due to the time lag between permitted impacts and completion of the compensatory mitigation actions; (2) regular monitoring to ensure completion; (3) assurances of long-term protection of compensation sites; (4) financial assurances; and (5) identification of the parties responsible for specific project tasks. The Port will submit this Plan to NMFS and EPA for approval or disapproval within 2 years of the start of Phase I, and complete all actions necessary to mitigate the adverse effects of operations within 5 years of the start of Phase I.”

During design of Phase II EPA and NMFS will likely assess additional mitigation needs for the Terminal 4 project. NMFS provided Conservation Measures on the Phase I Removal Action. These measures have been incorporated into the project design or otherwise required by EPA.

4.2 AQUATIC FOOD WEB

The project area has been regularly disturbed in the past by maintenance dredging and is already degraded by industrial waterway activities and the high chemical contamination of the sediment. Initially, the dredging and the placement of the caps and shoreline fills will kill (remove or smother) most benthic life within the affected areas, although mobile species will

avoid the dredging and discharge. This represents a real, but insignificant loss to the aquatic food web. A similar biological community should redevelop relatively rapidly as much of the slip bottom will not be affected by the abatement actions. Presumably, if the abatement actions are effective, a real (although still insignificant) improvement to the aquatic food web should result.

4.3 WILDLIFE

Although the abatement measures would be expected to displace birds and any resident mammals during actual construction, no significant effect is expected.

5. POTENTIAL IMPACTS ON SPECIAL AQUATIC SITES

5.1 SANCTUARIES AND REFUGES

Not applicable.

5.2 WETLANDS

No effect. No vegetated wetlands occur on Site.

5.3 MUDFLATS

Not applicable.

5.4 VEGETATED SHALLOWS

Not applicable.

5.5 RIFFLE AND POOL COMPLEXES

Not applicable.

6. POTENTIAL EFFECTS OF HUMAN USE CHARACTERISTICS

6.1 MUNICIPAL AND PRIVATE WATER SUPPLIES

Presently there are no water intakes within the slip or within its immediate vicinity downstream. No effects are anticipated.

6.2 RECREATIONAL AND COMMERCIAL FISHERIES

The Willamette River is a major fisheries corridor and a well-known recreational fishery area. T4 and the river immediately offshore are not known to be a popular recreational fishing location. No commercial fishery occurs in the river. Construction is restricted to the normal summer work window (July to October) to minimize impacts to salmonids. Additionally, NMFS's Conservation Measures include a requirement for a fish deterrent system to encourage fish movement past the dock at Berth 410. All fishing activities will be displaced from the slip and immediate water area around the project area during construction.

6.3 WATER-RELATED RECREATION

The Site is a maritime industrial site and is not generally available for recreational boating. The construction activities may require recreational boaters bypassing the Site in the river to stay farther away from the shore. However, such conflicts are considered inconsequential and insignificant.

6.4 AESTHETICS

The shoreline stabilization measures may result in a "tidier" appearance; however, no significant change in aesthetics is expected.

6.5 PARKS, NATIONAL AND HISTORIC MONUMENTS, NATIONAL SEASHORES, WILDERNESS AREAS, RESEARCH SITES, AND SIMILAR PRESERVES

Not applicable.

7. EVALUATION AND TESTING OF DISCHARGE MATERIAL

7.1 GENERAL EVALUATION OF DREDGED OR FILL MATERIAL

See Section 2.6. The sediments to be removed are contaminated and are regarded as unsuitable for open-water disposal. The T4 project file contains the record of past and recent characterization study reports. Contaminants at the RAA include polynuclear aromatic hydrocarbons (PAHs) (fluoranthene, pyrene, benzo(a)anthracene, chrysene, and anthracene); metals (mercury, cadmium, lead, and zinc); pesticides (DDT and dichlorodiphenyldichloroethane [DDD]), and polychlorinated biphenyls (PCBs). Many of these contaminants are known or suspected human carcinogens. In addition, pencil pitch (coal tar), a source of contamination in sediments, contains chemicals that are known or are suspected carcinogens in humans through skin contact, inhalation, or ingestion. The contaminated sediments represent a potential continuing source of releases to the river and have the potential to impact human health and/or ecological receptors. While the sediments removed represent a significant removal of the worst of the contaminated mass, the removal does not result in a “clean” waterway.

Materials to be used for capping and shoreline stabilization work will most likely be commercial upland quarries (see Section 2.8). Given the coarse nature of the material, the environmental risks are judged to be very low.

7.2 EVALUATION OF CHEMICAL-BIOLOGICAL INTERACTIVE EFFECTS

7.2.1 Exclusion of the Material from Testing

See Section 7.1. The dredged material has been tested. Imported material must meet specified physical and chemical properties, as outlined in the Construction Specifications (Appendix E) prior to being used. Sampling and analysis of materials before and during construction, coupled with visual inspections of import materials, will be completed to verify suitability.

7.2.2 Water Column Effects

Dredging and actual discharges within and outside of the slip will result in measurable turbidity. The condition is expected to be of limited duration and scale owing to the short construction schedule. No significant water column effects are anticipated.

7.2.3 Effects on Benthos

See Section 4.2. Benthos in the immediate area of the construction will be removed or smothered. Species that are more mobile will tend to avoid the area during the construction. Any benthic loss is considered unavoidable but not significant for this action.

7.3 COMPARISON OF EXCAVATION AND DISCHARGE SITES

7.3.1 Total Sediment Chemical Analysis

See Sections 7.1 and 7.2.1.

7.3.2 Biological Community Structure Analysis

Not applicable.

7.4 PHYSICAL TESTS AND EVALUATIONS

See Sections 2.6 and 7.2.1.

8. PROPOSED AND ALTERNATIVE ACTIONS TO MINIMIZE ADVERSE EFFECTS

All appropriate management actions (e.g., actions concerning material to be discharged or controlling the material after discharge) have been included in the proposed action. Specific pre-, during, and post-construction monitoring will occur as described in the DAR or RAWP approved by EPA for this action.

9. ANALYSIS OF PRACTICABLE ALTERNATIVES

The abatement measures required through this Phase I Removal Action are considered to be a water-dependent use. The various reports contained in the T4 project file, and especially the EE/CA provide a complete and acceptable description of alternatives considered for remediation at T4. The EE/CA alternatives analysis determined that no practicable alternatives exist that result in less environmental damage and which also meet the objectives of the T4 removal action purpose and need. Phase I encompasses abatement measures consistent with the selected alternative in the EE/CA and needs to be initiated in the near term to reduce risk and address any imminent and substantial endangerment at T4 that may exist. All appropriate management actions (e.g., actions concerning material to be discharged or controlling the material after discharge) have been included in the action proposed.

10. FACTUAL DETERMINATIONS

10.1 PHYSICAL SUBSTRATE DETERMINATIONS

The dredging will remove highly contaminated sediments (but not all contaminated sediments) from waters of the United States and in doing so will temporarily alter bathymetry in the slip. As the slip is an active port industrial facility, similar action and associated effects have occurred repeatedly in the past. In time (2 to 4 years), accreted sediments will fill in the dredged area. The caps placed will raise the bottom elevation measurably (~1 foot) but not significantly. If the cap remains stable, the new surface will be physically similar to present, as accretion is expected to deposit new material onto the new caps. To the extent that shoreline stabilization measures intrude into the river, the newly placed riprap material will be covered to some extent (dusting to several centimeters) by deposited sediments.

10.2 WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

No measurable effect on these parameters is expected. The river is not saline.

10.3 SUSPENDED PARTICULATES/TURBIDITY DETERMINATIONS

Sediments will be resuspended by activities associated with this Phase I Removal Action. Turbidities resulting from the dredging will cause measurable turbidities (water discoloration) outside of the slip and required designation of a case-specific point of compliance. This turbidity does not represent a significant release of suspended sediment or of associated particle-associated chemicals of concern.

10.4 CONTAMINANTS DETERMINATIONS

The abatement measures will reduce, but not eliminate, risk to the human and aquatic environment.

10.5 AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

The dredging activities will have temporary and minor adverse impacts on the aquatic ecosystem and organisms at the dredging site. Cap placement and shoreline stabilization (to the extent of intrusion in the river) will bury benthic and other sedentary aquatic organisms present at those locations—also a temporary and minor adverse effect. Recolonization of these disturbed organisms is anticipated within several weeks to several months following construction. The area is already a distressed habitat, and the Phase I Removal Action is unlikely to cause substantial long-term change or improvement in habitat function.

10.6 PROPOSED DISPOSAL SITE MIXING ZONE DETERMINATIONS

The State of Oregon Water Quality Standards do not allow for use of defined mixing zone determinations for dredging and many other aquatic construction activities. However, EPA has determined that this work constitutes “...essential dredging, construction or other legitimate activities...” under Oregon’s water quality law and regulations and applicable water quality standards (340-041-0036). EPA has prepared a Water Quality Monitoring and Compliance Conditions Plan (WQMCCP) that defines appropriate points of compliance. EPA expects that short-term exceedances of water quality standards, if any, will be outweighed by

the long-term benefit of completing the Phase I Removal Action; however, all water quality standards will be met at the following points of compliance:

“For this project, the outer boundary of the water area a distance of 100 meters from the approximate center of the Removal Action activity is defined as the point of compliance for all field parameters other than turbidity. The compliance point for turbidity is 100 meters beyond the inner harbor line.”

The zone of compliance is defined as the entire water area within the point of compliance.

10.7 DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Cumulative impacts are defined as the changes in the aquatic ecosystem that are attributable to the collective effect of a number of individual discharges of dredged or fill material into waters of the United States. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous discharges in an area can result in a major impairment of the water resources and interfere with the productivity and water quality of the existing ecosystem. This action, together with past and reasonably foreseeable future actions, will not result in significant detrimental cumulative impacts on the aquatic ecosystem. This action, including removal of contaminated sediments and required compensatory mitigation, together with future Phase II remediation of contaminated sediment in Portland Harbor, are expected to result in a cumulatively positive effect.

10.8 DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

The Phase I Removal Action (the abatement measures) will reduce risk and address any imminent and substantial endangerment at T4 that may exist. The action does not eliminate risk to the human and aquatic environment, and it will not directly cause other actions to occur that would affect the aquatic environment. Current secondary effects on the aquatic environment from the T4 Site remain substantially unchanged.

11. REVIEW OF CONDITIONS FOR COMPLIANCE

11.1 AVAILABILITY OF PRACTICABLE ALTERNATIVES

No practicable alternatives that result in less environmental damage and which meet the objectives of the T4 removal action purpose and need and this abatement action are judged to exist. All appropriate management actions (e.g., actions concerning material to be discharged or controlling the material after discharge) have been included in the action proposed.

11.2 COMPLIANCE WITH PERTINENT LEGISLATION

11.2.1 State Water Quality Standards and Federal Toxic Effluent Standards (Section 307 of the Clean Water Act)

See Section 10.6.

11.2.2 Endangered Species Act of 1973

By letter dated February 19, 2008, the FWS concurred with the determination that the action “may affect, but is not likely to adversely affect” bull trout. NMFS provided Conservation Measures on the Phase I Removal Action and required mitigation for the Wheeler Bay stabilization work (see Section 4.1). These measures and mitigation requirements have been incorporated into the project design or required by EPA.

11.2.3 Marine Sanctuaries (Marine Protection, Research, and Sanctuaries Act of 1972)

Not applicable.

11.3 POTENTIAL FOR SIGNIFICANT DEGRADATION OF WATERS OF THE UNITED STATES AS A RESULT OF THE DISCHARGE OF POLLUTED MATERIAL

Due to the methods of construction employed, measures to minimize water quality effects, and site conditions (i.e., size), the potential for long-term degradation of the waters of the United States as a result of the discharges evaluated here is considered unlikely. Short-term water quality effects during actual construction are anticipated and are expected to be only minor and localized.

11.4 STEPS TO MINIMIZE POTENTIAL ADVERSE IMPACTS ON THE AQUATIC ECOSYSTEM

All practicable and necessary steps have been included.

12. FINDINGS

The proposed discharges associated with the T4 Phase I Removal Action are found to comply with the requirements of the Section 404(b)(1) Guidelines with the completion of the condition for mitigation. EPA, in consultation with NMFS, will ensure that the mitigation agreed to for this Phase I Removal Action is completed. This document supplements the existing preliminary 404(b) (1) evaluation for the T4 remediation. Mitigation conditions for this larger action (Phase II) also have not yet been satisfied and remain outstanding. Accordingly, EPA's finding of compliance with the CWA 404 ARAR remains preliminary and conditional.

Reviewed and Approved by:

Sean Sheldrake, RPM
Environmental Cleanup Office

Date

12. FINDINGS

The proposed discharges associated with the T4 Phase I Removal Action are found to comply with the requirements of the Section 404(b)(1) Guidelines with the completion of the condition for mitigation. EPA, in consultation with NMFS, will ensure that the mitigation agreed to for this Phase I Removal Action is completed. This document supplements the existing preliminary 404(b) (1) evaluation for the T4 remediation. Mitigation conditions for this larger action (Phase II) also have not yet been satisfied and remain outstanding. Accordingly, EPA's finding of compliance with the CWA 404 ARAR remains preliminary and conditional.

Reviewed and Approved by:



Sean Sheldrake, RPM
Environmental Cleanup Office



Date

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