Record of Decision Amendment

Wyckoff/Eagle Harbor Superfund Site
Operable Units 1, 2, and 4
Beaches and Perimeter Wall
Bainbridge Island, Washington

U.S. Environmental Protection Agency
Region 10

May 2018

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Part 1—Declaration and
Part 2—Decision Summary

U.S. Environmental Protection Agency, Region 10

May 2018

Part 1—Declaration

Site Name and Location

Site Name: Wyckoff/Eagle Harbor Superfund Site
Location: Bainbridge Island, Kitsap County, Washington
Latitude: 47.61535 North; Longitude: -122.49986 West
U.S. Environmental Protection Agency Identification Number: WAD 009248295

Statement of Basis and Purpose

This document presents the decision by the U.S. Environmental Protection Agency (EPA)[1] to implement additional cleanup actions at the Wyckoff/Eagle Harbor Superfund Site (the Site or site) in Bainbridge Island, Kitsap County, Washington. This decision amends the 1994 Record of Decision (ROD) for the East Harbor Operable Unit (OU) 1 (OU1) (EPA, 1994)[2] and the 2000 ROD for upland OU2 and OU4 (soil and groundwater OUs, respectively) (EPA, 2000a). The additional cleanup actions include dredging and capping contaminated beach sediments, improving the access road, and replacing the aging perimeter steel sheet pile wall. These actions were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, United States Code Title 42, Section 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Code of Federal Regulations, Title 40, Part 300, as amended. This decision is based on the Administrative Record for the site. The State of Washington, acting through the Washington Department of Ecology, concurs with the Selected Remedy.

Site Assessment

The Selected Remedy in this Interim Record of Decision Amendment (RODA) is necessary to protect the public health, welfare, and/or environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from the site that may present an imminent and substantial endangerment to public health or welfare.

Description of the Selected Remedy

In the intertidal beaches adjacent to the former Wyckoff wood-treating facility, the current remedy is monitored natural recovery; this remedy in this portion of the site is not functioning as designed. Contaminant concentrations exceed cleanup goals in several beach areas. This Interim RODA modifies the 1994 cleanup decision for portions of the intertidal beaches with the decision to remove contaminated sediments through dredging and off-site disposal and install a cap to contain any potential future nonaqueous phase liquid (NAPL) seepage. Dredging and capping will treat or remove source materials constituting principal threats in the intertidal portion of OU1 adjacent to the former Wyckoff wood-treating facility.

The Selected Remedy for the intertidal beaches adjacent to the former wood-treating area includes the following activities:

- Dredging approximately 6,600 cubic yards of contaminated sediment from select areas

[1] Acronyms and abbreviations are compiled at this end of this RODA.

[2] Reference citations are assembled at the end of this RODA.

- Backfilling dredged areas with a multilayer cap, including placing reactive materials (such as oleophilic clay or other reagents) at the base of the cap to retard upward NAPL seepage, then restoring dredged areas to grade with clean, imported materials
- Disposing of dredged sediments off site (landfill)
- Monitoring to confirm dredged and backfilled areas remain clean
- Monitoring outside active cleanup areas to confirm natural recovery effectiveness
- Implementing institutional controls to prohibit marine construction activities that could disturb the capped areas of the beach.

In the upland (OU2 and OU4) portion of the former Wyckoff wood-treating facility, the current remedy is containment. A steel sheet pile wall around the perimeter of the facility is a key element of the containment system. The above-ground portion of the wall is corroding rapidly and must be replaced to prevent contaminated groundwater, creosote, and contaminated soils from eroding into Puget Sound. The Selected Remedy involves constructing a new reinforced concrete wall, to be built adjacent to the outboard/seaward side of the existing wall. The Selected Remedy also includes making improvements to the existing access road. The improvements, which will reduce the steep grade over a portion of the road and straighten a sharp curve, are needed to transport large construction equipment and materials to the work area.

Statutory Determinations

The Selected Remedy will protect human health and the environment, comply with federal and State requirements that are applicable or relevant and appropriate within the scope of this interim remedial action, be cost effective, and use permanent solutions and alternative treatment technologies to the extent practicable for this site.

The Selected Remedy will satisfy the statutory preference for treatment as a principal element of the remedy by treating dredged sediment contaminated with NAPL if necessary to reduce contaminant mobility before transport and disposal in a landfill and by using reactive materials in the base of the cap to intercept and adsorb upwelling NAPL.

The Selected Remedy will address two immediate needs at the site: (1) ongoing human exposure to contaminants on the beaches, and (2) potential for failure of the current perimeter wall. Additional actions needed to address contaminated soils and groundwater in the upland portion of the former wood-treating facility will be presented in a future decision document. Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within 5 years after the remedial action is initiated to ensure that the remedy protects, or will protect, human health and the environment.

Record of Decision Data Certification Checklist

The following information is included in the Decision Summary (Part 2) of this RODA. Additional information can be found in the Administrative Record for the site.

- Contaminants of concern and their respective concentrations (Section 5)
- Baseline risks represented by the contaminants of concern (Section 7)
- Cleanup levels established for contaminants of concern and the basis for these levels (Section 8)
- Methods for addressing source materials constituting principal threats (Section 11)
- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and the RODA (Section 6)

- Potential land and surface water use that will be available at the site as a result of the Selected Remedy (Section 6)
- Estimated capital, annual operation and maintenance, and total present worth costs; discount rate; and number of years over which the remedy cost estimates are projected (Section 13)
- Key factors that led to the selection of the remedy (Section 10)

Approved by U.S. Environmental Protection Agency, Region 10:

Sheryl L. Bilbrey, Director
Office of Environmental Cleanup

5/14/18
Date

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Part 2—Decision Summary

This Decision Summary provides an overview of the cleanup work to date, contamination remaining in Operable Unit (OU) 1 (OU1) intertidal sediments, associated risks to human health and the environment, and cleanup alternatives considered at the Wyckoff/Eagle Harbor Superfund Site (the Site), as well as the U.S. Environmental Protection Agency's (EPA's) Selected Remedy to address these risks. This Decision Summary also explains how the Selected Remedy fulfills statutory and regulatory requirements.

1.0 Site Name, Location, and Brief Description

The Wyckoff/Eagle Harbor Superfund Site (EPA Identification Number WAD009248295) is located on the east side of Bainbridge Island in central Puget Sound (Figure 1), at 5350 Creosote Place NE, Bainbridge Island, Washington. The Site includes the former Wyckoff Company wood-treating facility on the south shore of Eagle Harbor, more than 70 acres of contaminated subtidal and intertidal sediments in the harbor, and the upland and in-water portions of a former shipyard on the harbor's north shore. Historically, the Wyckoff Site has been divided into the following four OUs:

- **OU1: East Harbor OU** includes contaminated intertidal and subtidal sediments in the eastern portion of Eagle Harbor associated with wood-treating operations at the former Wyckoff facility.
- **OU2: Soils OU** includes contaminated surface soil and structures associated with the Former Process Area (FPA) of the Wyckoff facility.
- **OU3: West Harbor OU** includes the upland areas and intertidal and subtidal contaminated sediments associated with former shipyard operations on the north shore of Eagle Harbor.
- **OU4: Groundwater OU** includes contaminated subsurface soil and groundwater associated with operations at the FPA of the Wyckoff facility.

OU2 and OU4 are referred to collectively as **OU2/4**, or the **Soils and Groundwater OUs**. In this document, this portion of the Site is also called the former process area or FPA.

EPA is the lead agency for the Site, supported by the Washington Department of Ecology (Ecology). EPA added the Site to the National Priorities List (NPL) in 1987. Extensive investigation and cleanup activities have taken place in the intervening 30 years. This interim Record of Decision Amendment (RODA) revises two existing cleanup decisions: the East Harbor OU (OU1) Record of Decision (1994 ROD; EPA, 1994) and the Soil and Groundwater OUs (OU2 and OU4) ROD (EPA, 2000a).

The current remedy for intertidal beaches in OU1—monitored natural recovery (MNR)—failed to meet the ROD's cleanup goals in portions of the beaches adjacent to the former wood-treating facility. In 2012, sampling and analysis revealed that sediments in specific areas of the beaches remained contaminated above risk-based cleanup levels 10 years after implementation of source control actions (HDR Engineering, Inc. [HDR], et al., 2012).

The current remedy in OU2/4—containment—has prevented large-scale releases of contaminants to Eagle Harbor. The containment system includes two components: (1) a steel sheet pile wall around the perimeter of the FPA and (2) groundwater extraction and treatment system. The steel sheet pile wall is corroding rapidly and is expected to lose structural integrity within 3 to 5 years; therefore, the wall needs to be replaced soon. The wall must be replaced before any additional cleanup actions are implemented, because wall failure could cause recontamination of the beaches. Therefore, EPA is addressing both issues—ongoing contamination in the beaches and replacement of the perimeter wall—in this decision document.

Additional cleanup actions are also being planned to address contamination remaining in upland soils and groundwater. The cleanup decision for the upland soils and groundwater OUs will be presented in a future decision document.

2.0 Site History and Enforcement Actions

This section of the RODA summarizes the Site history and briefly discusses of EPA and State removal, remedial, and enforcement activities.

2.1 History of Site Operations

Suquamish people camped along the Eagle Harbor shoreline for centuries. Two ethnohistoric period and historic period villages have been recorded in addition to several precontact clamming, fishing, hunting camps and short-term activity locations. At least one burial location has been documented (Brooks, pers. comm., 2016). Starting in 1903, a major shipyard was established on the north shore of Eagle Harbor. After flourishing during World War I, the yard languished during the 1930s. In the 1940s and 1950s, the emphasis was on constructing and repairing military ships and conducting postwar decommissioning.

Wood-treating operations began on the harbor's south shore in 1905. From 1905 through 1988, a succession of companies treated wood for use as railroad ties, utility poles, pier pilings, and wood stave pipes. By 1910, pressure treatment with creosote or bunker oil had begun. In later years, wood was also treated with pentachlorophenol (PCP). Early operations took place on docks and pile-supported buildings. Over time, a series of bulkheads were built, and the area behind them filled, creating the existing upland area. For decades, logs were treated using heat and pressure inside retorts, which are long, cylindrical tanks sealed at both ends. Freshly treated wood was removed from the retorts and dried in the open air. Excess chemical solution that dripped from the wood went directly onto the ground and seeped into the soil and groundwater. This practice began in the mid-1940s and continued until operations ceased in 1988. Other significant contaminant releases resulted from leaking storage tanks and piping, storing treated wood in the water, and using process wastes and sludge as fill between bulkheads in the 1950s.

2.2 Previous Investigations and Cleanup Actions in OU2 and OU4 (Upland Soil and Groundwater)

In 1984, EPA issued a Unilateral Administrative Order requiring the Wyckoff Company to conduct environmental investigation activities under the Resource Conservation and Recovery Act (RCRA). Data collected at the time revealed the presence of significant soil and groundwater contamination. The Site was added to the NPL in 1987 and a more thorough remedial investigation (RI) was completed in 1989 (CH2M HILL Engineers, Inc. [CH2M], 1989).

Groundwater extraction and treatment began at selected wells in 1990. In 1993, EPA assumed responsibility for operation and maintenance (O&M) of the groundwater extraction and treatment system because the company was financially unable to do so. Between 1992 and 1994, EPA conducted a time-critical removal action at the facility, removing creosote sludge and contaminated soils, disposing asbestos, constructing a new bulkhead, and removing and recycling materials left in the retorts and tanks.

In 1994, a Focused Remedial Investigation/Feasibility Study (RI/FS) for the Groundwater OU was completed, and an interim ROD was issued (CH2M, 1994). The interim ROD required additional actions, including replacement of the existing groundwater treatment plant and sealing and abandonment of on-site water supply wells. In 1996 and 1997, most of the remaining above grade structures were demolished and the debris was removed and disposed of off site. In 1998, EPA conducted an evaluation of thermal treatment technologies, including the removal of contaminants from soil and groundwater using steam injection and groundwater extraction. Steam enhanced extraction was selected in a 2000 ROD for OU2 and OU4 (EPA, 2000a). The 2000 ROD also included a contingency remedy—containment—to be implemented if a pilot scale study of steam enhanced extraction could not meet cleanup goals.

Figure 1
Site Location and Operable Units
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

EPA

In 2001, a steel sheet pile wall was constructed around the perimeter of the FPA. A smaller sheet pile wall was also constructed around an area of heavily contaminated soils near the center of the FPA that had been selected for the pilot study. The pilot study began in October 2002. Equipment problems hampered operations, and the pilot study was terminated in April 2003. The most serious problems encountered were aspiration of liquid by the vapor-vacuum pumps, overloading of the water treatment system, and clogging of pipes and treatment facilities by naphthalene precipitation.

Although the pilot treatment system encountered many operating problems, it was successful in that it enabled EPA to evaluate the technology. Through that test, EPA determined that cleanup goals for the Groundwater OU could not be met using steam enhanced extraction. Therefore, EPA began to implement the contingency remedy—containment—in 2004. The aging groundwater treatment system was replaced in 2010. The containment remedy is still in operation today, and consists of the following components:

- **Groundwater Extraction and Treatment System—**The groundwater extraction system consists of nine recovery wells screened in the upper aquifer. These wells draw groundwater and nonaqueous-phase liquid (NAPL) away from the facility perimeter and toward the extraction wells. Ecology has been operating the groundwater extraction and treatment system since 2012.
- **Perimeter Wall—**The interlocking steel sheet pile wall was constructed around the FPA's west, north, and east sides to prevent contaminant release to Eagle Harbor. The wall is more than 1,800 feet long. It extends from above the ground downward into a confining layer 25 to 80 feet below ground surface.
- **Long-Term Monitoring—**A monitoring program provides data on water levels in both the upper and lower aquifers beneath the FPA (for confirming hydraulic containment), and on contaminant distribution and movement in the subsurface. Monitoring is ongoing.
- **Engineering Controls**—Engineering controls (for example, fencing) and access controls have been implemented to restrict site use, thereby preventing direct exposure to surface soils.

2.3 Previous Investigations and Cleanup Actions in OU1 (East Harbor)

The 1989 RI revealed extensive polycyclic aromatic hydrocarbon (PAH) contamination of surface and shallow subsurface sediments in Eagle Harbor (CH2M, 1989). To address this contamination, EPA implemented a time-critical removal action to cap more than 54 acres of contaminated sediments. Capping began in September 1993 and was completed in March 1994. The cap covered contaminated sediments under a thick (1 to 5 feet) layer of clean sand. Capping was selected as the primary remedy for sediment contamination in the 1994 ROD, with MNR in the intertidal beaches, which is the subject of this document. The cap was extended in several phases and now covers more than 70 acres, as shown in Figure 2.

In 2001, EPA installed the perimeter pile wall (described above) around the west, north, and east sides of the FPA. The wall stopped the discharge of contaminated soil, groundwater, and NAPL to the beaches, allowing the process of natural recovery to begin.

In 2005, EPA received reports from citizens about odors and sheen on the beach west of the FPA. EPA investigated, determined the extent of residual creosote contamination, and designed a three-layer cap called an exposure barrier system (EBS) to cover the contaminated portion of the beach. EPA documented this additional cleanup decision, which amended the 1994 ROD, in a 2007 Explanation of Significant Differences (ESD; EPA, 2007). The EBS was built in 2008.

In 2012, EPA determined that cleanup levels had not been met in the intertidal beaches adjacent to the FPA, despite 10 years of MNR following source control measures. After making this determination, EPA began a focused feasibility study (FFS) to evaluate the extent of NAPL remaining in the beaches. EPA found NAPL seeps in two areas—East Beach and North Shoal. Creosote is visible when the beaches are exposed at low tide, and it generates sheens and odor on the beach surface. Portions of the beaches remain contaminated with PAHs at concentrations above ROD cleanup levels. In the *Focused Feasibility Study Wyckoff/Eagle*

Harbor Superfund Site Operable Unit 1 (CH2M, 2016a), EPA evaluated a range of cleanup options to address the remaining contamination.

In 2017, the EPA repaired a portion of the original cap in Eagle Harbor. State ferry operations had caused erosion of the cap in the vessel traffic lane near the ferry terminal, exposing contaminated sediment. The repair included placing new sand over 9 acres of the cap, and armoring 4 acres of the repair area with a rock layer to prevent future erosion. A Regulated Navigation Area (Code of Federal Regulations [CFR] Title 33, Part 165.1307) prohibits anchoring, dredging, or other activities that could disturb the cap.

2.4 Previous Investigations and Cleanup Actions in OU3 (West Harbor)

The EPA's 1989 RI of Eagle Harbor (CH2M, 1989) included intertidal and subtidal sediment sampling and analysis across a large portion of the harbor. The RI revealed an area of metal-contaminated sediment offshore of the former shipyard on the harbor's north side. EPA issued an initial cleanup decision for the shipyard (EPA, 1992), then amended the cleanup decision in December 1995 (EPA, 1995a). The remedy included upland source control measures, including soil stabilization and capping; a tidal barrier system to minimize contaminant seeps from the site to the adjacent beach; capping of contaminated sediments; and institutional controls (ICs). The cleanup was completed in 1997. The former shipyard is currently used by the Washington Department of Transportation for maintenance of state ferries. Because the remedy is functioning as designed and no additional actions are planned, OU3 is not discussed further in this RODA.

2.5 History of Enforcement Actions

EPA issued an order requiring the Wyckoff Company to conduct environmental investigations in 1984. In July 1988, EPA ordered the company to install groundwater extraction wells and a groundwater treatment plant to halt continuing releases of wood-treating contaminants to Eagle Harbor. The facility ceased operations in 1988, and the company was renamed Pacific Sound Resources (PSR).

A settlement with PSR—covering both the Wyckoff facility and a wood-treating facility in Seattle—was embodied in a consent decree entered in federal district court in August 1994. The decree created the PSR Environmental Trust, into which the heirs of the Wyckoff Company founders, owners, and operators placed all ownership rights and shares in the company. This allowed the trust to maximize liquidation of all company assets. The beneficiaries of the trust are the United States Department of Interior, National Oceanic and Atmospheric Administration, and the Suquamish and Muckleshoot Tribes as Natural Resource Trustees, as well as EPA (the Superfund trust fund) for reimbursement of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) remedial costs.

Proceeds from the trust funded early cleanup activities and natural resource restoration projects, both at the Wyckoff facility and at a sister facility in Seattle. However, collections from the trust, which totaled less than $20 million, were dwarfed by substantial cleanup costs at the two facilities. To date, EPA has spent more than $180 million on site investigations and cleanup actions at the Wyckoff Site. In 2012, EPA conducted a search for additional potentially responsible parties and did not discover any other viable parties who could be liable for EPA response costs.

3.0 Community and Tribal Participation

EPA and Ecology coordinated closely throughout the development of the OU1 FFS (CH2M, 2016a) and held regular meetings with a community stakeholder group to share investigation results and answer questions from community members. The draft final OU1 FFS, addressing contamination remaining in the intertidal beaches, was made available to the public in April 2016, along with the *Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2, and 4)* (Proposed Plan; EPA, 2016a). These as well as other relevant Site documents can be found in the Administrative Record for the Proposed Plan.

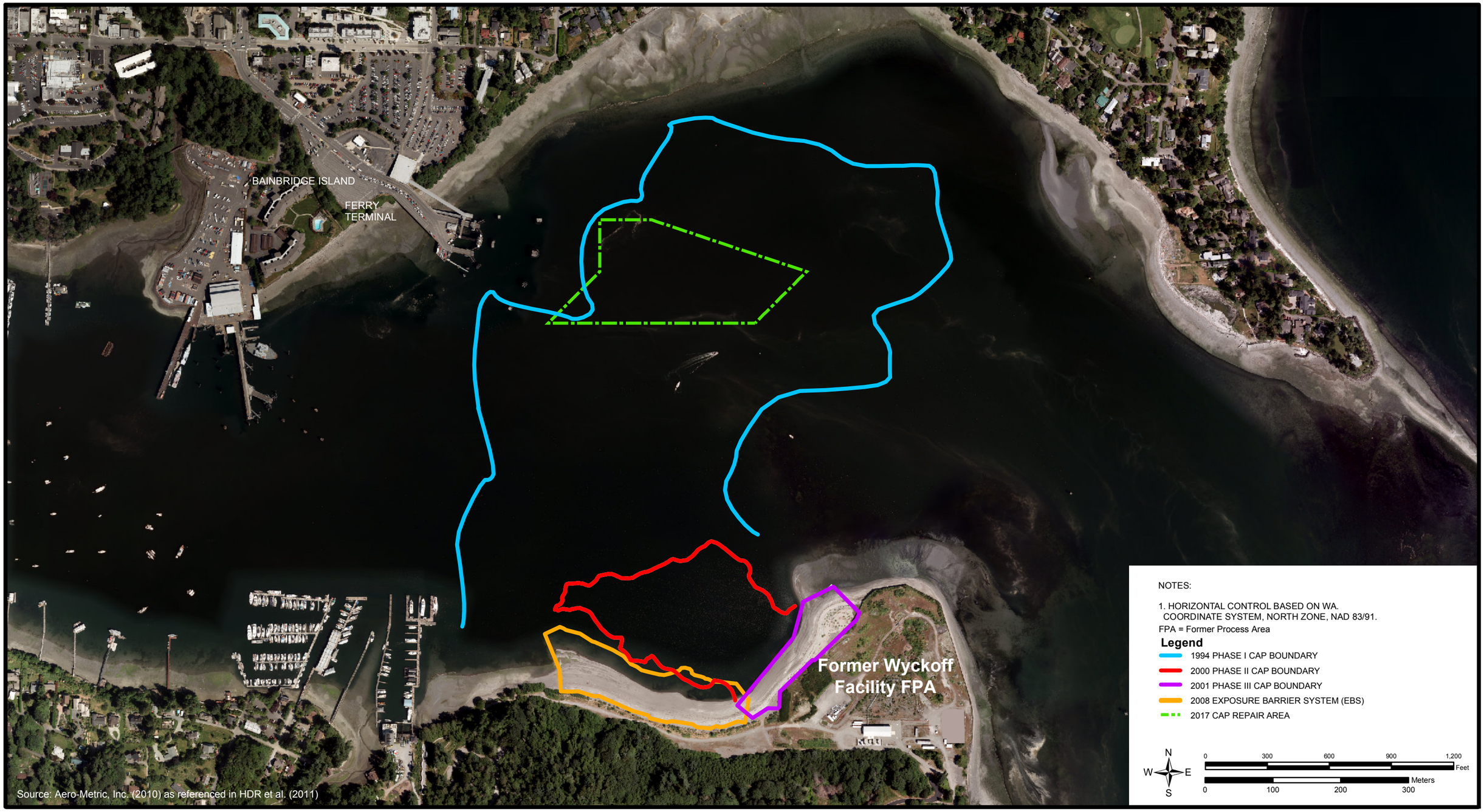


Figure 2
East Harbor (OU1) Cleanup Actions to Date
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

EPA

Copies of the Administrative Record are available to the public at the following locations: 1) the EPA's office in Seattle; 2) at the Bainbridge Island public library, located at 1270 Madison Avenue, Bainbridge Island; and 3) on EPA's Superfund project website at: http://www.epa.gov/superfund/wyckoff-eagle-harbor.

Notice of the availability of the Proposed Plan and associated documents was published in the *Bainbridge Islander* on April 22, 2016, along with notice of a public meeting to be held on April 27, 2016. Information about the Proposed Plan and public meeting was sent by email to 553 individuals who had signed up previously to receive project updates by email. A fact sheet summarizing the Proposed Plan and announcing the public meeting was mailed to 875 individuals on the Site's mailing list. Notice of the public meeting was advertised in the City of Bainbridge Island's (City's) weekly community newsletter. Flyers informing the community about the public meeting were posted at the Site and on community notice boards at grocery stores, the ferry terminal, and other high-traffic locations. *Bloomberg News* ran a story about the Proposed Plan and public meeting on April 26, 2016.

A public meeting was held at Bainbridge Island City Hall on April 27, 2016. The EPA accepted verbal and written comments at the public meeting. The *Kitsap Sun* ran an article about the Proposed Plan on May 6, 2016. The public comment period, originally scheduled to end on May 31, was extended to June 30, 2016, after the EPA received a written request to extend the comment period. The EPA's responses to comments received during the public comment period for the Proposed Plan is included in the Responsiveness Summary (Part 3), which is part of this RODA.

Federal and tribal natural resource trustee agencies participated in the 1994 federal consent decree. The funds recovered were used for restoration projects, including eelgrass restoration east of the former wood-treating facility and a shoreline restoration project south of the facility. The EPA has continued to keep the trustee agencies appraised of cleanup efforts and planning and sought input from them on the Proposed Plan.

The Suquamish Tribe reserved the right to gather resources within Eagle Harbor and other areas of its usual and accustomed fishing area in the 1855 Treaty of Point Elliot. The Tribe, as a sovereign nation, has engaged in government-to-government consultations with the EPA on the cleanup process and decisions. The EPA will continue to consult with the Tribe throughout the decision-making process of response actions, including design, construction, and long-term monitoring.

4.0 Scope and Role of Response Action

EPA's overall remedial strategy for the Wyckoff/Eagle Harbor Site is to address contaminated media and complete exposure pathways that post unacceptable risk to human health and the environment. Consistent with that strategy, this interim RODA modifies the current cleanup decision for three OUs—East Harbor OU (OU1), Soils OU (OU2), and Groundwater OU (OU4); it makes no changes to the cleanup decision for the West Harbor OU (OU3).

In the Proposed Plan issued in April 2016 (EPA, 2016a), EPA proposed additional remedial action for OU1, OU2, and OU4 beyond that described in this Selected Remedy. This RODA includes a subset of the larger proposed action to move forward more quickly to address human health risks associated with the beaches and the failing sheet pile wall. This RODA is consistent with the overall remedial strategy for the site. EPA plans to issue a second RODA that addresses the remaining portions of the April 2016 Proposed Plan before the end of 2018.

4.1 Changes to the Cleanup Decision for OU1 (East Harbor)

The cleanup decision currently in place for OU1, East Harbor, is described in two decision documents:

- East Harbor Operable Unit, Wyckoff/Eagle Harbor Superfund Site Record of Decision (EPA, 1994)
- Explanation of Significant Differences, Wyckoff/Eagle Harbor Superfund Site, East Harbor Operable Unit, September 2007 (EPA, 2007)

The 1994 ROD established cleanup goals for all of Eagle Harbor, including both subtidal and intertidal (beach) sediments. Cleanup goals in subtidal areas were to be met through capping, and cleanup goals in intertidal sediments were to be met through MNR. EPA estimated that MNR will require 10 years following implementation of source control actions to halt the release of contaminants from the upland portion of the site to the intertidal beaches.

In the 2007 ESD (EPA,2007), EPA modified the cleanup decision, selecting additional chemical-specific cleanup goals for intertidal sediment on West Beach, and changing the cleanup technology on West Beach from MNR to a multi-layer cap called an Exposure Barrier System (ESB). No changes were made to the cleanup decision for the remaining intertidal beaches. As a result, there are currently two cleanup decisions in place for the intertidal beaches.

The Selected Remedy presented in this interim RODA establishes new cleanup levels for intertidal beach sediments within the East Harbor OU, replacing the cleanup levels (called "cleanup goals" at the time of the 1994 ROD) and the point of compliance for the intertidal beaches that were established in the 1994 ROD and the 2007 ESD. Cleanup goals in the 1994 ROD were selected to protect benthic organisms in OU1, and to protect human health from shellfish consumption risk in intertidal sediments. The 2007 ESD revised the human health cleanup level, but only on the beach west of the FPA and only in the top six inches of the sediment. Because dermal absorption factors for PAHs were not yet available, neither the 1994 nor the 2007 cleanup level calculations included risks from dermal contact. The new cleanup levels were selected to be protective of human health across all of the intertidal beaches, assuming dermal contact with sediment to a depth of 2 feet, which is consistent with recreational use of the beaches. This interim RODA does not change the cleanup levels or the cleanup technology for the subtidal portion (-2 feet mean lower low water [MLLW] and deeper) of the East Harbor OU. In subtidal areas, the cleanup levels remain unchanged from the 1994 ROD, and capping remains the selected cleanup technology. This interim RODA adds a new cleanup technology—dredging and capping—to portions of the East Beach and North Shoal. Outside the dredging and capping footprint, the remedy remains MNR. This interim RODA does not change the cleanup technology for West Beach, where the EBS installed in 2008 is functioning as designed.

4.2 Changes to the Cleanup Decision for OU2 and OU4 (Upland Soils and Groundwater)

The Selected Remedy presented in this RODA involves replacing the steel sheet pile wall and making improvements to the access road between Eagle Harbor Drive and the FPA. This decision includes no other changes to the remedy for OU2 and OU4. The cleanup changes to OU2 and OU4 to address the source of contamination in the former processing area will be included in a second decision document, expected to be completed before the end of 2018. Changes to remedial action objectives and chemical-specific cleanup levels are discussed in greater detail in Section 8 of this RODA.

5.0 Site Characteristics

This section describes the site's physical setting and summarizes the nature and extent of contamination remaining in the intertidal beaches of OU1.

5.1 Physical Setting

The former Wyckoff/Eagle Harbor wood-treating facility is located on the south shore of Eagle Harbor. The property covers 54 acres, including 13 acres of relatively flat land where historical wood-treating operations occurred (the FPA). The remainder of the property consists of a steeply sloped, wooded hillside. Eagle Harbor Drive, which runs east/west along the top of the slope above the site, lies approximately 100 feet above the FPA.

The offshore portion of the site consists of intertidal beaches and subtidal areas of Eagle Harbor. Eagle Harbor is shallow, with maximum depths of -56 feet MLLW. Intertidal beaches extend seaward from the sheet pile wall, ranging in elevation from +5 feet MLLW near the base of the wall to -2 feet MLLW at the northern edge of North Shoal. Intertidal sediments consist of interbedded sands, gravels, and silts. Shoal

areas transition to deeper subtidal zones of Puget Sound to the east of the site and to Eagle Harbor to the north and west.

5.2 Contaminant Transport Pathways

Before the perimeter sheet pile wall was constructed, creosote and contaminated groundwater in the FPA discharged to Eagle Harbor and Puget Sound. The perimeter wall largely eliminated further contaminant transport to adjacent intertidal beaches. However, considerable quantities of creosote were left outside the wall, because it was impracticable to enclose all contamination beneath the intertidal beaches within the perimeter wall.

Groundwater in the FPA in an upper aquifer and a lower aquifer that are separated by an aquitard—a relatively dense layer of soils, including marine silt, glacial deposits, and clay. The aquitard is just below the ground surface along the southern edge of the FPA, and it slopes steeply downward toward the north and is encountered at depths of -70 feet MLLW and deeper in the northern part of the FPA. The aquitard slows but does not completely prevent contamination from moving from the upper aquifer into the lower aquifer. In places, the aquitard is thin or absent, and there are sandy layers within the aquitard that contain creosote. Contaminant transport pathways are summarized in the conceptual site model depicted in Figure 3.

5.3 Contaminants of Concern

The primary wood preservative used at the Wyckoff facility was creosote—a thick, oily liquid distilled from coal tar. Creosote contains more than a hundred individual chemicals including PAHs such as naphthalene and benzo(a)pyrene. Creosote in the soil and groundwater occurs primarily in the form of a NAPL. Both light NAPL (LNAPL) and dense NAPL (DNAPL) occur in upland soils. LNAPL is found at the top of the upper aquifer, where it moves up and down with seasonal and tidally induced groundwater elevation changes, creating a contaminant smear zone in the soil. LNAPL also occurs in intertidal beach sediment. DNAPL is found in the deeper portions of the upper aquifer. PCP was also used as a wood preservative. PCP is found in LNAPL and in groundwater. Dioxins/furans were generated at the Wyckoff facility as a by-product when wood contaminated with creosote and other chemicals was burned for fuel. Dioxins/furans are also impurities in PCP. Dioxins/furans are found in soil, LNAPL, and DNAPL.

In the 2000 ROD, the EPA stated that "for the purposes of cleanup, it is assumed that other contaminants are co-located with the PAHs and PCP and will be remediated along with these primary contaminants of concern." This assumption remains true today. Contaminants including PCP and dioxins/furans are co-located with the PAHs, and the PAHs are present primarily in the NAPL.

In intertidal beach sediments, the contaminants of concern (COCs) are PAHs and PCP. PAHs were identified as COCs in the 1994 ROD. PCP was identified as an additional COC in the 2007 ESD for West Beach. Metals are COCs in subtidal sediments, but not in intertidal beach sediments. For the purposes of cleanup, PCP and dioxins/furans are assumed to be colocated with the PAHs, which are present primarily in NAPL. Actions that remove or contain NAPL will also remove or contain PCP and dioxins/furans.

5.4 Nature and Extent of Contamination Remaining in OU1 (Intertidal Beach Sediment)

In 2012, 10 years after the perimeter sheet pile wall was installed, EPA sampled the East Beach and North Shoal sediments to determine whether cleanup levels had been achieved. These beaches were the focus of the investigation because they were the only areas where MNR, in lieu of active remedial measures (capping and the EBS), had been implemented, and the potential for exposure to contaminated sediments still remained. Significant improvements were seen, including sharp declines in PAH concentrations and a decrease in the number and severity of NAPL seeps. However, cleanup levels had not been achieved everywhere on the beaches and some NAPL seeps remained. An additional investigation to map the extent of NAPL beneath the beaches (CH2M, 2013), revealed the following:

- NAPL is present in both East Beach and North Shoal subsurface sediments.

- NAPL is not uniformly distributed. Most NAPL is in the central part of East Beach and the North Shoal near the former West Dock. The thickest total NAPL accumulations occur near the perimeter sheet pile wall. The volume of NAPL and the thickness of the NAPL layers decreases with increasing distance away from the wall.
- NAPL seeps occur in a few locations. Several of the seeps are persistent and can be found in the same location year after year. The largest seep is on East Beach.

The distribution of NAPL in subsurface beach sediments is shown in Figure 4.

6.0 Current and Potential Future Land and Surface Water Use

The City purchased the former Wyckoff wood-treating facility, with the intent to use the land as a park. The purchase took place in phases over several years beginning in 2004. Most of the property is already in use as a park. Pritchard Park includes hiking trails through the wooded hillside between Eagle Harbor Drive and West Beach, parking lots, and a viewpoint looking east across Puget Sound. The Bainbridge Island Japanese American Exclusion Memorial occupies the far western end of the property. Today, only the FPA remains fenced and inaccessible to the public. The City plans to expand the park to include the FPA once the cleanup is complete. Future land use is anticipated to remain recreational/open space.

Intertidal beaches west, north, and east of the FPA are popular recreational areas. Community members walk their dogs on the beaches, launch kayaks and standup paddle boards from the beaches, and swim offshore during warm weather. Signs are posted to warn people about creosote contamination remaining on the beaches, but people regularly use the closed portion of the beaches. The Washington Department of Health (DOH) maintains a health advisory for fish and shellfish collection in Eagle Harbor. People are advised to eat no more than one meal per week of flatfish from Eagle Harbor. The harbor is closed to recreational shellfish collection.

Eagle Harbor is within the treaty reserved fishing area of the Suquamish Tribe, and the Tribe hopes that the beaches can be reopened for shellfish harvesting in the future. Intertidal beaches at the site provide important shoreline habitat, supporting forage fish, clams, benthic invertebrates, and shorebirds. A portion of the beach west of the FPA was constructed as habitat mitigation to compensate for the permanent loss of beach habitat caused by the installation of the perimeter sheet pile wall. Eelgrass beds that begin at the outer edge of the beaches are particularly important habitat in Puget Sound. Natural Resource Trustee agencies completed an eelgrass restoration project east of the site. Deeper waters offshore of East Beach includes an area classified as an Approved Shellfish Growing Area by Washington DOH. The Suquamish Tribe uses the Approved Shellfish Growing Area classification in managing tribal harvests of geoduck clams and other bivalves for subsistence, ceremonial, and commercial purposes. The beach features discussed here are shown in Figure 5. The anticipated future use of the beaches is recreational beach use, with tribal fish and shellfish harvesting.

7.0 Summary of Site Risks

Baseline human health and ecological risk assessments were performed for the East Harbor OU in the late 1980s. The results were presented in the 1989 RI (CH2M, 1989), updated in 1991 (CH2M, 1991), and summarized in the 1994 ROD (EPA 1994). Human health risks were reevaluated in 2007 when contamination was discovered in the sediment on West Beach. This evaluation resulted in new, lower cleanup levels to protect recreational beach users on West Beach. The new cleanup levels were included in the 2007 ESD for OU1 (EPA, 2007). To inform selection of cleanup levels for this RODA, exposure pathways and COCs that were shown to contribute the most risk in the previous evaluations were reevaluated using recent data.

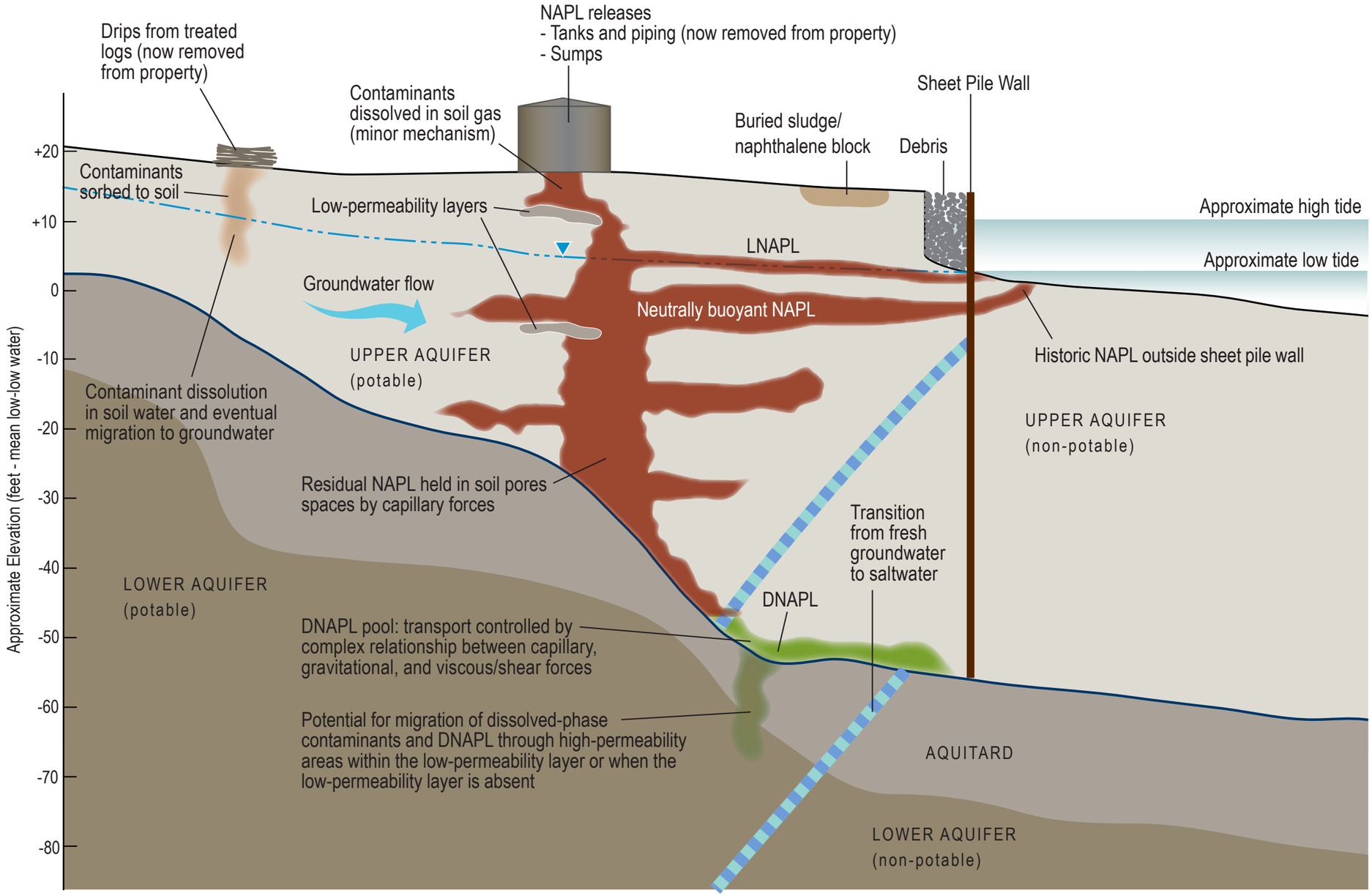


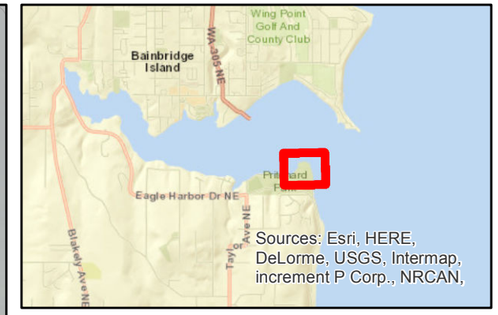
Figure 3
Conceptual Site Model
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

North Shoal

East Beach

Sheet Pile Wall

West Beach



LEGEND

- Estimated TarGOST® Response Areas With Potentially Non-Mobile NAPL (<50%RE)
- Estimated TarGOST® Response Areas With Potentially Mobile NAPL (>50%RE)
- Wyckoff OU-1 Focused Feasibility Study Project Area
- West Beach Boundary
- 2002 Phase III Cap Boundary
- 2008 Exposure Barrier System (EBS)
- Surface Elevation Contours in Feet (MLLW) 1-foot contour intervals were generated using USACE interpolation methods 2011 survey data provided by USACE

N

0 25 50 100 150 200 Feet

Bathymetric Contour Source: USACE 2011
Source: Aero-Metric, Inc. (2010) as referenced in HDR et al. (2011)

Figure 4
NAPL Distribution in Subsurface Sediments
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

EPA

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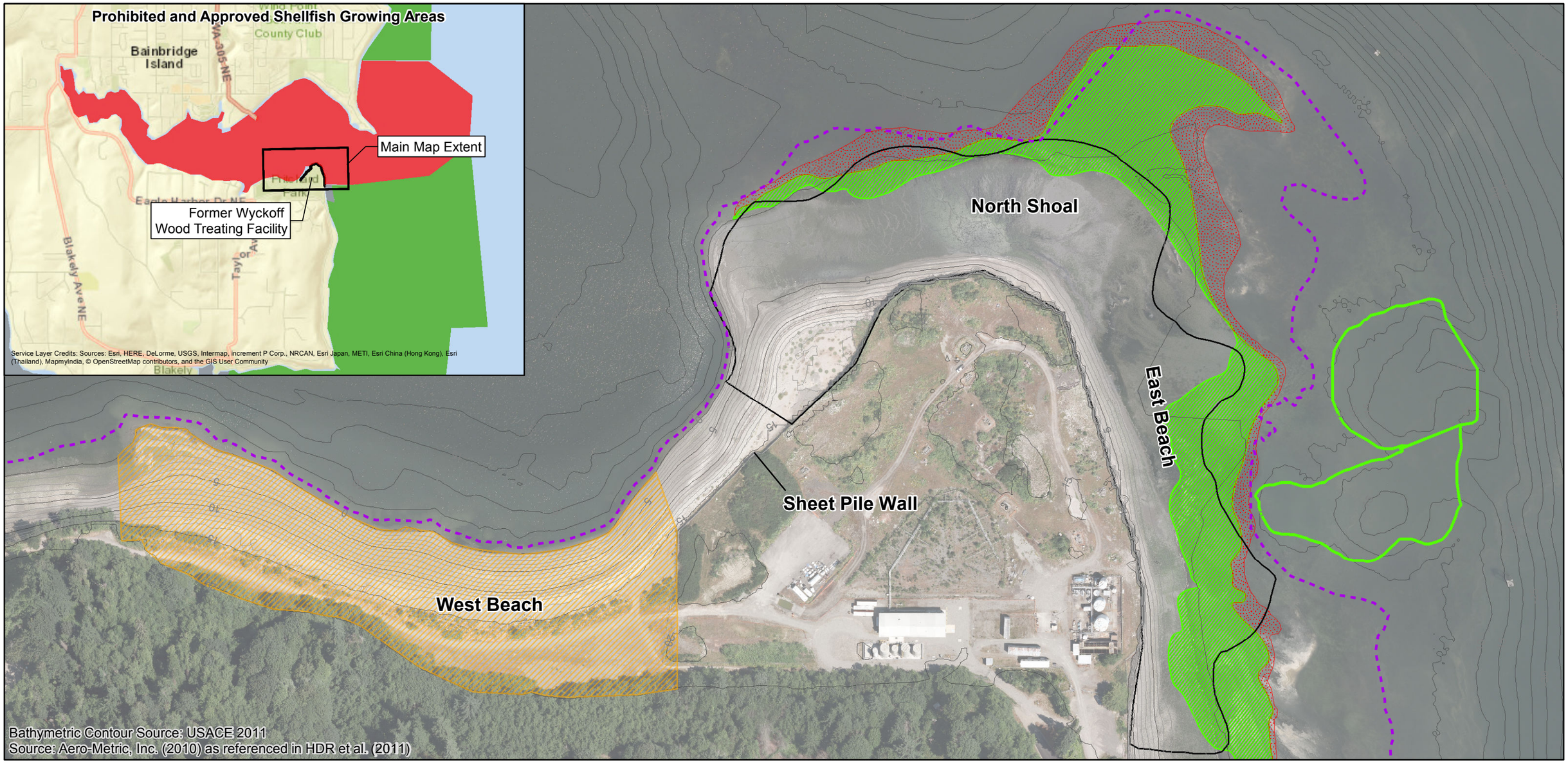

LEGEND

- Wyckoff OU-1 Focused Feasibility Study Project Area
- Intertidal Sediment (-2 feet MLLW)
- Habitat Mitigation Area
- Surface Elevation Contours in Feet (MLLW)
  1-foot contour intervals were generated using USACE interpolation methods
  2011 survey data provided by USACE
- NRDA Eelgrass Restoration Project Area

Generalized Extent of Eelgrass

- Eelgrass
- Probable Eelgrass (unconfirmed)

INSET MAP LEGEND

Shellfish Commerical Growing Areas

- Approved
- Prohibited
- Unclassified

N

0 50 100 200 300 400 Feet

Figure 5
Natural Resource Features of OU1
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

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EPA

7.1 Risk from Exposure to Beach Sediments

People could be exposed to contaminants in beach sediments through recreational beach use, when harvesting shellfish, and when consuming shellfish harvested from contaminated sediments. The EPA reevaluated the risk posed by these scenarios to develop cleanup levels for this RODA. Because the site is within the usual and accustomed fishing area of the Suquamish Tribe, tribal shellfish consumption rates were used in the risk calculations. The greatest risk to tribal consumers, who both collect and eat shellfish, was determined to be from carcinogenic PAHs (cPAHs). This scenario includes dermal exposure to and incidental ingestion of sediment and ingestion of contaminated shellfish tissue.

The total excess lifetime cancer risk (ELCR) using a tribal scenario is 8×10^{-5}. The total ELCR using a nontribal recreational scenario is 3×10^{-6}. Noncancer hazards were also evaluated. Because cancer is a more sensitive endpoint for the COCs at Wyckoff, cleanup actions that achieve cleanup levels protective for cancer risk will also be protective for noncancer effects. For both tribal and recreational beach users, most calculated risk comes from shellfish consumption, rather than dermal exposure. The risk calculations are summarized in Table 2-1. EPA has established a target ELCR risk range of 1×10^{-4} to 1×10^{-6} for Superfund cleanup sites. Washington's Model Toxics Control Act (MTCA) requires that sediment cleanup levels result in an estimated lifetime risk of 1×10^{-6} for individual carcinogens. For multiple carcinogens and/or exposure pathways exceeding the 1×10^{-5} lifetime excess cancer risk, MTCA requires sediment cleanup objectives to be adjusted downward so that the total lifetime excess cancer risk does not exceed 1×10^{-5}.

Exposure to NAPL on the surface of the beaches also poses a short-term risk. People who get creosote on their skin can develop chemical burns. Beach closure signs warn people not to walk barefoot on the beaches.

Contaminants in beach sediments pose an unacceptable risk to benthic invertebrates—worms, clams, and other organisms that live in the sediment. To evaluate this risk, COC concentrations were compared to the Washington Sediment Management Standards (SMS). The SMS chemical criteria for protection of marine benthic invertebrates are based on relationships between sediment contaminant concentrations and adverse effects on benthic invertebrates (reduced population size or laboratory toxicity tests showing mortality, reduced growth, or impaired reproduction) that were determined using several hundred samples from the Puget Sound area. The methods used to develop the SMS criteria are consistent with CERCLA ecological risk assessment methodology. The SMS include two sets of sediment contaminant concentration goals for protecting benthic invertebrates: (1) Sediment Cleanup Objective (SCO) represents a "no adverse effect level," below which adverse impacts on benthic organisms are unlikely, and (2). Cleanup Screening Level (CSL) represents a "minor adverse effect level," above which adverse impacts are more likely to occur.

In the top 10 centimeters of sediment in the North Shoal and East Beach, the risk evaluation revealed a few exceedances of SMS values. Out of five sampling locations on North Shoal, one location had COC concentrations greater than the SCOs; on East Beach, one out of 15 sampling locations had COC concentrations above the SCOs. More extensive contamination was found below the beach surface. In samples collected 10 centimeters below the surface and deeper, four out of eight stations on East Beach had COC concentrations above the SCOs. A higher number of chemicals exceeded SCO criteria in deeper samples than in the surface, and many chemicals exceeded both the SCOs and the CSLs.

7.2 Basis for Action

The Selected Remedy in this RODA is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants, or contaminants from the site which may present an imminent and substantial endangerment to public health or welfare.

Portions of the intertidal beaches have not met the cleanup levels specified in the 1994 ROD, despite more than 16 years of natural recovery following installation of the perimeter sheet pile wall. Persistent NAPL seeps on the beaches, sediment PAH concentrations that exceed cleanup levels, and continued risk from

shellfish consumption all support the need for additional cleanup actions on the beaches. In addition, the perimeter sheet pile wall must be replaced to prevent further contamination of the beaches. The existing wall is corroding rapidly and is at risk of structural failure.

8.0 Remedial Action Objectives and Cleanup Levels

In accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the EPA developed Remedial Action Objectives (RAOs) to describe what the proposed cleanup is expected to accomplish to protect human health and the environment. RAOs help focus the development and evaluation of remedial alternatives and form the basis for establishing cleanup levels.

8.1 Remedial Action Objectives

The three new RAOs for intertidal sediments established by this RODA are listed below. These RAOs replace the RAOs for intertidal sediments established in the 1994 ROD and modified by the 2007 ESD. No changes are proposed to the RAOs for subtidal sediments, which were established in the 1994 ROD. RAOs for intertidal sediments are presented in Table 2-2 along with the 1994 RAOs and the basis for any changes:

- **RAO 1—Reduce to protective levels the risk to human health posed by dermal contact and incidental ingestion of contaminated sediments in intertidal beach areas.** This RAO will be met in two ways: (1) when NAPL seeps are no longer observed on the surface of the beach during visual inspections conducted at low tide. The EPA expects that this objective will be achieved immediately after construction of the Selected Remedy; and (2) when the upper confidence limit on the mean (UCL95) concentration of COCs in the top 2 feet of beach sediments is at or below cleanup levels for the protection of human health, provided in Table 2-3.
- **RAO 2—Reduce levels of COCs in sediments to concentrations that protect benthic community health.** This RAO will be met when the concentration of COCs in the top 10 centimeters of sediment, on a point-by-point basis, are at or below cleanup levels for the protection of benthic organisms provided in Table 2-3.
- **RAO 3—Reduce levels of COCs in shellfish tissue to concentrations that protect tribal shellfish consumers, and prevent risks from consumption of shellfish until protective levels are achieved.** Shellfish tissue COC concentrations are expected to decline following active remedial measures that reduce contaminant concentrations in sediment and porewater. Target tissue concentrations for shellfish are discussed in Section 8.4. Meeting this RAO will also address risks to the shellfish themselves. Shellfish consumption advisories, signage and outreach will be used to reduce risks until target tissue concentrations are achieved.

8.2 Cleanup Levels

This section describes the selected cleanup levels for intertidal sediments. The cleanup levels are contaminant concentrations that will be used to measure the success of the Selected Remedy in meeting the RAOs. Cleanup levels must comply with applicable or relevant and appropriate requirements (ARARs) and result in residual risk levels that fully satisfy the CERCLA requirements for the protection of human health and the environment.

ARARs are legally applicable or relevant and appropriate substantive (as opposed to administrative) standards, requirements, criteria, or limitations under any federal environmental law, or promulgated under any state environmental or facility siting law that is more stringent than federal law. ARARs are discussed further in Section 10.1.

Table 2-1. Cancer Risk Calculations

Contaminant of Concern	Cancer Slope Factor (mg/kg-day)-1	Exposure Concentration		Risk: Incidental Sediment Ingestion Only	Risk: Dermal Exposure (Clamming)		Risk: Shellfish Consumption	Total Direct Contact Risk: Incidental Ingestion + Dermal Exposure		Total Risk: Incidental Ingestion + Dermal Exposure + Shellfish Ingestion	
		Sediment (µg/kg)	Shellfish (µg/kg)		With Boots	Without Boots		With Boots	Without Boots	With Boots	Without Boots
Cancer Risk Calculations: Tribal Shellfish Collector Scenario [a]											
Benzo(a)pyrene	1.0E+00	688	1.7	3E-07	6E-07	2E-06	3E-05	9E-07	2E-06	3E-05	3E-05
Benzo(a)anthracene	1.0E-01	2,361	5.5	1E-07	2E-07	5E-07	1E-05	3E-07	6E-07	1E-05	1E-05
Benzo(b)fluoranthene	1.0E-01	814	5.5	4E-08	7E-08	2E-07	1E-05	1E-07	2E-07	1E-05	1E-05
Benzo(k)fluoranthene	1.0E-02	814	1.3	4E-09	7E-09	2E-08	3E-07	1E-08	2E-08	3E-07	3E-07
Chysene	1.0E-03	2,297	12.5	1E-09	2E-09	5E-09	2E-07	3E-09	6E-09	2E-07	2E-07
Dibenz(a,h)anthracene	1.0E+00	80	0.9	4E-08	7E-08	2E-07	2E-05	1E-07	2E-07	2E-05	2E-05
Indeno(1,2,3-c,d)pyrene	1.0E-01	121	1.9	6E-09	1E-08	3E-08	4E-06	2E-08	3E-08	4E-06	4E-06
							Total	**2E-06**	**3E-06**	**8E-05**	**8E-05**
Cancer Risk Calculations: Recreational Shellfish Collector Scenario											
Benzo(a)pyrene	1.0E+00	688	1.7	1E-07	2E-07	6E-07	9E-07	4E-07	8E-07	1E-06	2E-06
Benzo(a)anthracene	1.0E-01	2,361	5.5	5E-08	8E-08	2E-07	3E-07	1E-07	3E-07	4E-07	5E-07
Benzo(b)fluoranthene	1.0E-01	814	5.5	2E-08	3E-08	7E-08	3E-07	4E-08	9E-08	3E-07	4E-07
Benzo(k)fluoranthene	1.0E-02	814	1.3	2E-09	3E-09	7E-09	7E-09	4E-09	9E-09	1E-08	2E-08
Chysene	1.0E-03	2,297	12.5	4E-10	8E-10	2E-09	6E-09	1E-09	3E-09	8E-09	9E-09
Dibenz(a,h)anthracene	1.0E+00	80	0.9	2E-08	3E-08	7E-08	5E-07	4E-08	9E-08	5E-07	5E-07
Indeno(1,2,3-c,d)pyrene	1.0E-01	121	1.9	2E-09	4E-09	1E-08	1E-07	7E-09	1E-08	1E-07	1E-07
							Total	**6E-07**	**1E-06**	**3E-06**	**3E-06**

[a] Calculated using Suquamish Tribe shellfish consumption rates

mg/kg-day milligrams per kilogram per day
µg/kg micrograms per kilograms

Table 2-2. Changes to the Remedial Action Objectives for Intertidal Sediments in Operable Unit 1 [a]

Exposure Scenario	Old RAO	Source	New RAO Established in this RODA	Reason/Basis for Changing the RAO
Human exposure (dermal contact, incidental ingestion) to beach sediments and NAPL	The 1994 ROD cleanup levels for sediments harborwide were the SMS MCUL values. In the 2007 ESD for West Beach, EPA added a supplemental objective for the EBS on West Beach to meet Washington (MTCA) residential soil standards for PAHs and PCP.	1994 ROD; 2007 ESD	RAO1: Reduce to protective levels the risk to human health posed by dermal contact and incidental ingestion of contaminated sediments in intertidal beach areas.	The new RAO uses risk-based standards protective of recreational and tribal use scenarios, instead of residential soil cleanup standards. The point of compliance is changed from the top 10 centimeters to the top 2 feet. The deeper depth recognizes that people who collect shellfish will dig as deep as needed to collect clams, which occur at 18 to 24 inches below the surface.
Protection of benthic organisms from exposure to contaminated sediments—both subtidal and intertidal	Achievement of the SQS (now called the SCO) and reduction of contaminants in fish and shellfish to levels that protect human health and the environment are long-term goals. The primary measurable objective was the MCUL, now called the CSL). *Note:* these cleanup goals were not written as RAOs. The term RAOs was not in use at the time of the 1994 ROD. Point of compliance: top 10 centimeters	1994 ROD	RAO 2—Reduce levels of COCs in sediments to concentrations that protect benthic community health.	This is the same goal established in the 1994 ROD, now written in the form of an RAO, consistent with current EPA guidance.
Human consumption of shellfish from intertidal beaches	Supplemental objective of 1,200 µg/kg HPAHs in sediment, to address human health risks from consumption of contaminated shellfish in intertidal areas. Point of compliance: top 10 centimeters.	1994 ROD; Basis: the 90th percentile of Puget Sound subtidal background HPAH concentrations	RAO 3—Reduce levels of COCs in shellfish tissue to concentrations that protect Tribal shellfish consumers, and prevent risks from consumption of shellfish until protective levels are achieved.	The new RAO specifically acknowledges Tribal consumption rates in setting cleanup goals, consistent with current EPA guidance. Because the relationship between sediment and clam tissue is poorly understood at the Wyckoff site, the RODA establishes a target tissue concentration rather than a sediment cleanup level.

[a] This RODA does not change the RAOs, sediment cleanup levels, or point of compliance for subtidal sediments; these were defined in the 1994 ROD (EPA, 1994) and remain unchanged.

COC	contaminant of concern	NAPL	nonaqueous-phase liquid
CSL	cleanup screening level	PAH	polycyclic aromatic hydrocarbon
EBS	exposure barrier system	PCP	pentachlorophenol
EPA	U.S. Environmental Protection Agency	RAO	Remedial Action Objective
ESD	explanation of significant difference	ROD	Record of Decision
HPAH	high-molecular-weight polycyclic aromatic hydrocarbn	RODA	Record of Decision Amendment
MCUL	minimum cleanup level	SCO	Sediment Cleanup Objective
µg/kg	micrograms per kilogram	SMS	Sediment Management Standard
MTCA	Model Toxics Control Act	SQS	Sediment Quality Standard

Table 2-3. Sediment Clean-Up Levels

Contaminant of Concern	RAO 2 Human Health Direct Contact	RAO 3 Benthic Community		Basis for Clean-Up Level
	Risk-Based Concentration, µg/kg (ppb) dry weight [a]	SMS SCO mg/kg (ppm) Organic Carbon [b, c]	LAET µg/kg (ppb) dry weight [b.c]	
LPAHs	NA	370	5,200	SMS
Napthalene	NA	99	2,100	SMS
Acenapthylene	NA	66	5,600	SMS
Acenaphthene	NA	16	500	SMS
Fluorene	NA	23	540	SMS
Phenanthrene	NA	100	1,500	SMS
Anthracene	NA	220	960	SMS
2-Methylnapthalene	NA	38	670	SMS
HPAHs	NA	960	12,000	SMS
Fluoranthene	NA	160	1,700	SMS
Pyrene	NA	1,000	2,600	SMS
Benz(a)anthracene	3,660	110	1,300	RBTC cancer (RAO 1) SMS (RAO2)
Chrysene	365,966	110	1,400	RBTC cancer (RAO 1) SMS (RAO 2)
Total benzofluoranthenes	NA	230	3,200	SMS
Benzo(b)fluoranthene	3,660	NA	NA	RBTC cancer
Benzo(k)fluoranthene	36,597	NA	NA	RBTC cancer
Benzo(a)pyrene	366	99	1,600	RBTC cancer (RAO 1) SMS (RAO 2)
Indeno(1,2,3 c,d)pyrene	3,660	34	600	RBTC cancer (RAO 1) SMS (RAO 2)
Dibenzo(a,h)anthracene	366	12	230	RBTC cancer (RAO 1) SMS (RAO 2)
Benzo (g,h,i)perylene	NA	31	670	SMS
cPAHs (sum TEQ)	366	NA	NA	RBTC cancer
PCP	519	NA	360	RBTC noncancer (RAO1) SMS (RAO2)

Table 2-3. Sediment Clean-Up Levels

Contaminant of Concern	RAO 2 Human Health Direct Contact	RAO 3 Benthic Community		Basis for Clean-Up Level
	Risk-Based Concentration, µg/kg (ppb) dry weight [a]	SMS SCO mg/kg (ppm) Organic Carbon [b, c]	LAET µg/kg (ppb) dry weight [b.c]	

[a] RBTCs for direct contact consider dermal contact and incidental ingestion. RBTCs are based on 1 in 1,000,000 excess cancer risk or HQ of 1 (EPA, 2018 unpublished).

[b] Benthic clean-up levels are based on the benthic SCO in the SMS (WAC 173-204-562). For RAO 2, the SCO numerical criteria may be overridden by the SCO biological criteria in the SMS (WAC 173-204-562, Table IV).

[c] Carbon-normalized SCO values apply where sediment TOC content is within the rage of 0.5 percent to 3.5 percent. For sediment with TOC less than 0.5 percent or greater than 3.5 percent, the dry-weight LAET values apply; see Section 6.3.1.1 of Ecology (2015).

HQ	hazard quotient
LAET	lowest apparent effects threshold
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
NA	not applicable
PCP	pentachlorophenol
ppb	parts per billion
ppm	parts per million
RAO	Remedial Action Objective
RBTC	Risk-based threshold concentrations
SCO	Sediment Clean-up Objective
SMS	Sediment Management Standard
TEQ	toxicity equivalent
TOC	total organic carbon
WAC	Washington Administrative Code

In intertidal sediments, the most significant ARARs for developing cleanup levels for OU1 are in the SMS rules for sediment in Washington Administrative Code (WAC) 173-204, which are referred to in the MTCA general cleanup rules (WAC 173-340-760). Not all RAOs will be met by achieving specific cleanup levels. Table 2-4 summarizes how achievement of each RAO will be determined. Sediment cleanup levels are presented in Table 2-3.

8.2.1 Cleanup Levels for RAOs 1 and 2

Sediment cleanup levels for RAOs 1 and 2, and target tissue concentrations for RAO 3 are calculated at the SCO level. The human health-based cleanup levels for RAO 1 (human health direct contact) are risk-based threshold concentrations (RBTCs) for COCs resulting in a 1×10^{-6} excess lifetime cancer risk for individual carcinogens and a noncancer hazard quotient of less than 1. Sediment cleanup levels for Sediment RAO 2 (protection of benthic invertebrates) are based on the SCO for the protection of benthic invertebrates (benthic SCO) of the SMS which are defined by chemical and biological criteria for specific hazardous substances.

Table 2-4. Remedial Action Objective Achievement Measures

Remedial Action Objective	Measures Used to Determine When the RAO Has Been Met
RAO 1—Reduce to protective levels the risk to human health posed by dermal contact and incidental ingestion of contaminated sediments in intertidal beach areas.	This RAO will be met in two ways: (1) when NAPL seeps are no longer observed on the surface of the beach during visual inspections conducted at low tide. EPA expects that this objective will be achieved immediately after construction of the Selected Remedy; and (2) when the UCL 95 concentration of COCs in the top 2 feet of sediment across all beach areas west, north, and east of the FPA is at or below cleanup levels for the protection of human health, provided in Table2- 3.[a]
RAO 2—Reduce levels of COCs in sediments to concentrations that protect benthic community health.	This RAO will be met when the concentration of COCs in the top 10 centimeters of sediment, on a point-by-point basis, are at or below cleanup levels for the protection of benthic organisms provided in Table 2-3.
RAO 3—Reduce levels of COCs in shellfish tissue to concentrations that protect Tribal shellfish consumers, and prevent risks from consumption of shellfish until protective levels are achieved.	Shellfish tissue COC concentrations are expected to decline following active remedial measures that reduce contaminant concentrations in sediment and porewater. Target tissue concentrations for shellfish are discussed in Section 8.2. Meeting this RAO will also address risks to the shellfish themselves. Shellfish consumption advisories, signage and outreach will be used to reduce risks until target tissue concentrations are achieved.

[a] Along the southern (upper) edge of the EBS on West Beach, the sand layer of the cap is less than 2 feet thick. In this area, the point of compliance is 2 feet, or from the beach surface to the cobble layer of the EBS, whichever is shallower.

COC contaminant of concern
EPA U.S. Environmental Protection Agency
FPA former processing area
NAPL nonaqueous-phase liquid
RAO Remedial Action Objective
UCL 95 upper confidence limit on the mean

8.2.2 Cleanup Levels for RAO 3

For RAO 3 (shellfish tissue consumption), EPA selected a target concentration in shellfish tissue. Actions to minimize the release of COCs from the upland area to the intertidal beaches, in combination with active remedial measures in the beaches, will reduce COC concentrations in sediment and in porewater. These reductions are expected to result in declining contaminant concentrations in shellfish tissue. The target concentration for cPAHs is 0.12 micrograms per kilogram (µg/kg) [benzo(a)pyrene] toxicity equivalent (TEQ)[3] in the edible tissue of resident clams. This concentration represents the background concentration of cPAHs in clam tissue collected from nonurban locations in Puget Sound. Consistent with EPA guidance (EPA, 2002), the EPA selected the background concentration as the target tissue concentration because it is higher than the risk-based concentration of 0.050 µg/kg (benzo[a]pyrene) TEQ that will protect Suquamish tribal shellfish consumers, and maintaining tissue concentrations at levels below background will not be possible.

The MTCA/SMS rules require developing cleanup levels in sediment to protect fish and shellfish consumers; this Selected Remedy does not meet this SMS requirement. Because there was no clear relationship between contaminant concentrations in sediment and tissue, a protective cPAH concentration in sediment could not be derived. Therefore, EPA selected a target tissue concentration for RAO 3. Shellfish tissue concentrations are expected to decline following cleanup, but whether the target tissue concentration will be achieved is uncertain. For these reasons, this RODA is an interim RODA consistent with CERCLA Section 121(d)(4)(A). EPA believes this interim action will address immediate human health and environmental risks in OU1, and will neither exacerbate conditions at the site nor interfere with the

[3] cPAHs consist of a subset of seven PAHs which EPA has classified as probable human carcinogens: benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Individual PAH concentrations were summed, using compound-specific potency equivalency factors, resulting in a calculated carcinogenic PAH total (cPAH TEQ) for each sediment sample.

implementation of any future final remedy. This RODA will be followed by a future CERCLA decision document that will address compliance with MTCA/SMS, consistent with CERCLA.

The data set used to generate the background concentration is small, so the background concentration is uncertain. EPA will continue to monitor tissue concentrations at the site and collect shellfish from background locations to develop a more robust background data set. If long-term monitoring data and trends indicate that the target tissue concentration cannot be achieved, then the EPA will determine whether further remedial action could practicably achieve lower tissue concentrations. The EPA may also determine that the target tissue concentration should be adjusted, based on additional background data. Any changes to the target tissue concentration, selection of additional sediment cleanup levels to protect shellfish consumers, or additional cleanup actions will be documented in a future CERCLA decision document.

9.0 Description of Alternatives

As explained in Section 7.2, Basis for Action, EPA determined that additional cleanup actions are necessary to protect human health and the environment. This section presents and describes the remedial alternatives that were developed and evaluated.

9.1 Common Elements

All remedial action alternatives evaluated (except for Alternative 1, the No-Action Alternative) include MNR outside the active cleanup areas, upland disposal of dredged sediments, long term monitoring, and O&M. These common elements are described in greater detail below.

9.1.1 Monitoring Natural Recovery

All cleanup alternatives use MNR to achieve RAOs in the areas outside the active cleanup footprint. MNR was previously selected as the remedy for the intertidal beaches in the 1994 ROD. The EPA estimated that 10 years of MNR will be required following source control actions in the upland part of the site. Following installation of the upland sheet pile wall, MNR has been effective, and much of the intertidal beach area outside of the dredging and capping footprints already meets RAOs, except in areas with NAPL contaminated sediments.

All cleanup alternatives remove NAPL contaminated sediments from the upper layer of the beaches and replace it with clean, imported materials. Reactive materials in the bottom of the cap will minimize the movement of NAPL at depth up into the habitat layer of the cap. By removing NAPL, they will create the conditions under which MNR can be effective. Although predicting is difficult, the EPA estimates that after the additional planned remedial construction is complete, up to 10 years of MNR will be needed to achieve cleanup goals throughout the intertidal beaches.

9.1.2 Off-Site Disposal of Dredged Sediment

The cleanup alternatives include dredging varying volumes of contaminated sediment. The sediment will be disposed in an off-site landfill. Disposal must comply with RCRA Land Disposal Restriction (LDRs). The OU1 FFS assumed that dredged sediments would be dewatered in the upland portion of the site prior to off-site transportation for disposal and that water drained from the sediment would be handled in the upland portions of the site through infiltration and/or treatment in the groundwater treatment plant. The FFS also assumed that sediments would be stabilized by mixing in 5 percent by weight Portland cement prior to upland disposal. During the predesign investigation, waste characterization testing conducted will determine the specific treatment rate and type, if any, needed to prepare the sediment for transport and meet disposal requirements. If clean sediment can be segregated from contaminated sediment during the dewatering process, then clean sediment may be retained for on-site reuse.

9.1.3 Operation and Maintenance

None of the alternatives include operational costs other than monitoring. However, Alternatives 2, 3, and 4 assume that some maintenance will be required to maintain the sediment caps over time. These alternatives include using reactive materials, such as oleophilic clay, in the base of the caps. The reactive materials in the base of the cap may become saturated and require replacement. The FFS assumed that up to 25 percent of the capped area may require maintenance to replace the reactive material.

9.1.4 Long-Term Monitoring

All alternatives leave some contaminated sediment in place, so long-term monitoring will be required to ensure the remedy remains protective.

9.1.5 Institutional Controls

A federal Regulated Navigation Area (33 CFR 165.1307) prohibits anchoring, dredging, or other activities that could disturb the cap. Similar restrictions on marine construction activities will be needed to protect capped areas of the intertidal beaches. This could be accomplished through a separate IC for the intertidal beaches, such as an environmental covenant, or through expansion of the existing regulated navigation area. Shellfish consumption advisories are another important IC to protect human health. The Washington DOH's shellfish advisory program for Puget Sound includes Eagle Harbor. All cleanup alternatives involve monitoring shellfish tissue concentrations following construction, and coordination with the Washington DOH to ensure the advisory is updated as appropriate.

9.1.6 Access Road Improvements and New Perimeter Wall

All alternatives include two items included in the Proposed Plan as common elements of the upland cleanup alternatives: access road improvements and perimeter sheet pile wall replacement. Both of these items are critical to successful cleanup of the beaches, so they are included in this RODA. They are described briefly below and in greater detail in Section 13.2:

- **Access road improvements—**The current access road between Eagle Harbor Drive and the FPA has curves that are too sharp for large trucks to navigate. The road needs to be realigned before it can be used to haul construction equipment or materials to the site or remove large quantities of sediment or other debris.
- **New perimeter wall.** The steel sheet pile wall around the perimeter of the site is corroding above the mudline and is at risk of structural failure. The wall prevents contaminated soils and groundwater from eroding onto the intertidal beaches and into Puget Sound. The wall must be replaced before cleanup actions on the beaches are implemented.

9.2 Remedial Alternatives Considered

The alternatives considered to address contamination in the intertidal sediments are summarized below; more details are available in the FFS for OU1. A full description of the Selected Remedy is provided in Section 13 of this RODA.

9.2.1 Alternative 1—No Further Action

Estimated Capital Costs: $0	**Estimated Construction Timeframe: N/A**
Estimated O&M Costs: $0	**Estimated Time to Achieve RAOs: More than 20 years**
Total Estimated Present Value: $0	

The Superfund program requires that the No-Action Alternative be considered as a baseline for comparison with the other alternatives. Under Alternative 1, no further actions are taken to address the NAPL

contamination remaining in the beaches. The current remedy for the beaches, MNR, remain in place. The cleanup levels remain unchanged from the 1994 ROD, as amended by the 2007 ESD. Monitoring of all of OU1, including both the subtidal sediment cap and the intertidal beaches continues. MNR is expected to continue, resulting in further declines in COC concentrations. However, the beaches are unlikely to meet the RAOs within 10 years, particularly on East Beach, where the most significant and persistent NAPL seeps remain.

9.2.2 Alternative 2—Seep Capping

Estimated Capital Costs: $2,610,000	**Estimated Construction Timeframe: 2 months**
Estimated O&M Costs: $500,000	**Estimated Time to Achieve RAOs: 15 to 20 years**
Total Estimated Present Value: $3,110,000	**Excavation Volume: 900 cubic yards**

Alternative 2 includes small cap "patches" approximately 40 feet by 40 feet in size over active seep areas on the beaches; four active seep areas are known. These four areas are remediated, along with up to two additional seeps, resulting in active remediation over 0.3 acre of beach habitat. The remaining 10.5 acres are addressed through MNR. Seep areas are remediated by removing the top 30 inches of sediment and replacing the material with a permeable reactive cap. The cap consists of three layers:

- A 4- to 6-inch thick layer of reactive materials at the bottom of the excavated area
- An optional demarcation layer
- Clean sand above the demarcation layer

The reactive layer contains oleophilic clay or other reagents to intercept and adsorb NAPL and PAHs flowing upward through the cap. The demarcation layer discourages digging below it and provides a visual reference to aid future replacement or repair efforts, should they be needed. If the reactive layer is visibly different from the clean sand layer and made of materials that would discourage digging through it, then a separate demarcation layer may not be needed. Specific materials for the reactive layer and the demarcation layer would be evaluated and identified during design. The clean sand is approximately 2 feet thick and graded to match the beach around it so that beach elevation does not change as a result of the remedy.

O&M activities include monitoring to ensure the capped areas remain in place, and they effectively prevent exposure to remaining subsurface contamination. The reactive layer of the cap may require replenishing if breakthrough is observed. The cost estimate assumes that 25 percent of the capped areas require replenishment in Year 9, and 12 percent require replenishment again in Year 30.

9.2.3 Alternative 3—Partial Excavation and Capping (Selected Remedy)

Estimated Capital Costs: $8,920,000	**Estimated Construction Timeframe: 4 months**
Estimated O&M Costs: $2,850,000	**Estimated Time to Achieve RAOs: 10 to 15 years**
Total Estimated Present Value: $11,770,000	**Excavation Volume: 6,600 cubic yards**

Alternative 3 is the Selected Remedy for the intertidal areas of OU1. This alternative applies the same technology and construction technique as Alternative 2, but over a larger area. The cleanup footprint includes all areas of the beaches with NAPL in the top 3 feet of sediment. The Selected Remedy will actively remediate approximately 1.6 acres; the remaining 9.2 acres will be addressed through MNR. O&M requirements are the same as described for Alternative 2.

9.2.4 Alternative 4—Vertical Containment with Partial Excavation and Capping

Estimated Capital Costs: $12,840,000	**Estimated Construction Timeframe: 4 months**
Estimated O&M Costs: $2,380,000	**Estimated Time to Achieve RAOs: 10 to 12 years**
Total Estimated Present Value: $15,220,000	**Excavation Volume: 6,600 cubic yards**

Alternative 4 is similar to Alternative 3, but with an added remedial component—vertical containment walls. Vertical containment walls prevent further lateral movement of NAPL outward, away from the existing sheet pile wall to the outer portions of the beaches. Reducing the flow of NAPL could increase the recovery rate in the areas managed using MNR.

Vertical containment walls are constructed of interlocking steel sheet piles that extend from just below the surface of the beach to a depth of 20 feet below the mudline. They encircle areas of subsurface NAPL and attach to the existing perimeter wall. Areas inside the vertical containment walls are capped, using the three-layer permeable reactive cap as described for Alternatives 2 and 3. This alternative actively remediates approximately 1.6 acres; the remaining 9.2 acres are remediated through MNR. O&M requirements are the same as described for Alternative 2.

9.2.5 Alternative 5—Dredging

Estimated Capital Costs: $28,960,000	**Estimated Construction Timeframe: 8 months**
Estimated O&M Costs: $420,000	**Estimated Time to Achieve RAOs: 10 years**
Total Estimated Present Value: $29,380,000	**Excavation Volume: 26,000 cubic yards**

Alternative 5 involves dredging and removing contaminated sediment and NAPL to a depth of 10 feet in portions of the North Shoal and East Beach areas, removing most NAPL present in the top 10 feet from the beaches. This alternative actively remediates approximately 1.6 acres; the remaining 9.2 acres are remediated through MNR. Dredged areas are backfilled to grade with clean sand. To address NAPL left below the 10-foot excavation depth, a layer of oleophillic clay is placed at the bottom of the excavation prior to backfilling. O&M costs for Nearshore Alternative 5 are limited to monitoring. The capping materials are not replenished.

10.0 Summary of Comparative Analysis of Alternatives

EPA used the nine criteria (EPA, 1995b) required by CERCLA and the NCP to evaluate and select the remedy. Notably, this analysis assumes perimeter sheet pile wall replacement. The perimeter wall is critical to the success of any cleanup action in the beaches, because the wall prevents the continued discharge of contamination from the upland portion of FPA to the beaches. This section discusses the relative performance of each beach cleanup alternative against the nine criteria, noting how the Selected Remedy compares with the other alternatives. The nine criteria are in three categories: threshold criteria, balancing criteria, and modifying criteria.

10.1 Threshold Criteria Evaluation

These criteria specify what an alternative must meet to be eligible for selection as a remedial action.

10.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each

exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

All alternatives, except Alternative 1, protect human health and the environment through varying combinations of dredging, capping, and MNR. All active alternatives meet RAOs and provide a substantial reduction in risk when compared with baseline conditions. Alternative 2 would take the longest amount of time to meet RAOs, because it relies mostly on MNR.

All alternatives involve replacing the upland perimeter wall. The replacement wall will prevent upland contaminated soil and groundwater from becoming a source of contamination to the beaches, which may occur if the current wall is not repaired quickly. No remedy in the intertidal beaches could be effective without the continued containment provided by the perimeter wall.

10.1.1.1 Reduce Human Health Risk Posed by Direct Contact with Contaminated Sediment: RAO 1

Meeting RAO 1 will require cleanup actions that achieve specific concentrations of chemicals in the top 2 feet of sediment where human exposure may occur. Alternatives 3, 4, and 5 would achieve this RAO in the shortest amount of time, because they treat the largest area with dredging and capping. Alternative 2 would require the longest time to meet RAO 1 because of its smaller treatment area and greater reliance on MNR. Because they all address known NAPL seep areas, Alternatives 2, 3, 4, and 5 would all eliminate exposure to creosote on the surface of the beaches immediately after construction.

10.1.1.2 Protect the Benthic Community: RAO 2

Alternatives 3, 4 and 5 are most likely to meet RAO 2 quickly because they treat the largest area, and will replace contaminated sediment with clean, imported material.

10.1.1.3 Reduce Contaminant of Concern Concentrations in Shellfish Tissue: RAO 3

Alternatives 3, 4, and 5 are most likely to achieve the target tissue concentration in shellfish because they remove the largest mass of COCs from the depth interval where shellfish reside. Alternative 5 has less potential for recontamination, because any COCs left in place would be unlikely to move through the 10-foot thick cap to recontaminate surface or shallow subsurface sediments.

10.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site such that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes or provides a basis for invoking a waiver.

A complete list of ARARs is provided in the following three tables:

- Table 2-5—Chemical-specific ARARs
- Table 2-6—action-specific ARARs
- Table 2-7—location-specific ARARs.

The most significant ARARs for in-water/nearshore cleanup work are the Washington State MTCA/SMS requirements. As explained in Section 8.2.2, this RODA establishes a target tissue concentration for cPAHs in shellfish tissue. Using a target tissue concentration is not consistent with MTCA/SMS rules, which require a sediment cleanup level protective of tribal shellfish consumers. The same target tissue concentration applies to all of the alternatives evaluated, so no alternatives fully comply with MTCA/SMS requirements.

Other important ARARs for remedial actions in the beaches are Section 404 of the Clean Water Act and the LDR of the RCRA. Constructing the replacement perimeter wall will permanently fill intertidal habitat, requiring mitigation by enhancing or creating intertidal habitat. Habitat mitigation requirements will be addressed during remedial design when the amount of loss caused by the wall can be calculated. Contaminated sediments dredged from the intertidal beaches are subject to RCRA LDRs. Waste characterization testing during remedial design will determine the treatment, if any, needed to ensure landfill disposal meets RCRA requirements.

10.2 Balancing Criteria Evaluation

The following subsections summarize the comparative evaluation of the nearshore alternatives against the balancing criteria to identify the major trade-offs.

10.2.1 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes consideration of residual *risk that will remain on-site following remediation and the adequacy and reliability of controls.*

All alternatives leave NAPL-contaminated material at depth. Alternative 5 would be the most permanent and effective option in the long term, because it removes the largest volume of contaminated sediment from the marine environment. Alternatives 2, 3, and 4 would be more likely to require repair or replacement of cap sections, because the caps are thinner—2.5 feet thick, instead of the 10-foot-thick caps in Alternative 5. Alternative 2 is mostly likely to require future maintenance because of its smaller treatment area and greater reliance on MNR. Replacement of the upland perimeter wall, included in all alternatives, enhances the long-term effectiveness of the remedy by preventing recontamination of the beaches from upland contaminated soil and groundwater.

10.2.2 Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

All of the nearshore alternatives, except Alternative 1, assume landfill disposal of the dredged sediment, with treatment as needed to meet solid waste landfill disposal requirements. Alternatives 2, 3, and 4 include a top layer of sand underlain by a reactive layer that will reduce contaminant mobility and help ensure containment of contaminants that will be left beneath the cap. Other treatment options to reduce toxicity, mobility, and/or volume were eliminated from consideration in a technology screening evaluation prior to the FFS. In-situ treatment options were eliminated because of short and long-term impacts on intertidal sediment habitat functions. Ex-situ treatment options were limited by handling and storage concerns in the upland portion of the site, timing with upland cleanup actions, and dewatering and water treatment challenges.

10.2.3 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to the community, workers, and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternatives 3, 4, and 5 would be the most effective in reducing short-term risks because they address the largest surface area of the active treatment alternatives. Alternative 5 would remove a larger volume of contaminated sediment from the marine environment, but the temporary coffer dams required would damage nearby habitat, including sensitive eelgrass habitat. Replacement of the upland perimeter wall, included in all alternatives, will immediately reduce the risk of recontamination from potential failure of the current wall.

Impacts on the community and workers are expected to be minimal for Alternatives 2, 3, and 4. Construction would take place using conventional equipment on the beach at low tide. Impacts would be greater under Alternative 5 because of the need to build coffer dams around the excavation and capping areas. These temporary structures would require a crane and a vibratory hammer to install and remove and would generate more noise and visual impact than the shallower caps in Alternatives 2, 3, or 4.

10.2.4 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other government entities are also considered.

Alternative 2 would be the easiest to implement and could be completed quickly, in just 2 months. Alternatives 3 and 4, which would dredge and cap larger, more continuous areas of the beaches, would take approximately 4 months to construct. The FFS assumed that implementation of Alternatives 2, 3, and 4 would use land-based equipment driven out onto the beaches at low tide. It may be difficult to dredge and backfill, especially along the outer edges of the treatment areas. The farther out on the beach, the shorter the low-tide work window, and the harder it will be to keep excavated areas from collapsing. This may limit the implementability and potentially the effectiveness of these alternatives, especially Alternatives 3 and 4. During design, alternative construction methods may be selected for some or all of the remedial target areas. Alternative 5 would be very challenging to implement. Dredging and backfill activities would have to be done inside of temporary coffer dams sturdy enough and deep enough to hold water during low tides; this would require the work to be done from barges inside the coffer dams.

10.2.5 Cost

Costs include estimated capital, long-term O&M, and present value costs.

Capital costs and O&M costs, and 100-year net present value (NPV) costs for each remedial alternative, calculated with a 7-percent discount rate (as required by EPA guidance), are provided in Table 2-8. The estimated cost of $11.8 million for the selected alternative falls in the middle of the cost range for the FFS alternatives evaluated ($3.1 to $29.4 million). Table 2-8 also provides capital costs for replacement of the perimeter sheet pile wall, and for improvements to the access road. These “common elements” add additional costs of $24.6 million to each of the remedial alternatives. The total cost of the Selected Remedy, including Alternative 3 -Partial Excavation and Capping and the common elements, is $36.4 million.

10.3 Modifying Criteria Evaluation

This section summarizes the comparative evaluation of the upland and intertidal alternatives based on th modifying criteria of Community Acceptance and State/Tribal Acceptance. The EPA received comments on the Proposed Plan from 53 individuals and organizations, including the City of Bainbridge Island, Suquamish Tribe, and state government agencies including Ecology.

Table 2-5. Chemical-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Surface Water			
CWA 33 USC 1313 and 1314 (Sections 303 and 304). Most recent 304(a) list of recommended water quality criteria, as updated to issuance of the ROD	Under CWA Section 304(a), EPA develops recommended water quality criteria for water quality programs established by states. Two kinds of water quality criteria are developed: one for protection of human health, and one for protection of aquatic life. CWA Section 303 requires States to develop water quality standards based on Federal water quality criteria to protect existing and attainable use or uses (for example, recreation, public water supply) of the receiving waters.	The most recent 304(a) recommended water quality criteria are: **relevant and appropriate** as criterion to apply to short-term impacts from sheet pile installation, dredging, and capping if more stringent than promulgated state criteria	Contaminants could be released to Eagle Harbor and Puget Sound during in-water construction activities including construction of the new perimeter wall, sediment dredging and capping activities.
WAC 173-201A-240(5), Water Quality Standards for Surface Waters of the State of Washington	Establishes chemical water quality standards for surface waters of the State of Washington for protection of aquatic life.	State standards that are more stringent than federal standards are **relevant and appropriate** as criterion to short term impacts during construction and to any new point source discharges that may occur in implementing the remedy.	Contaminants could be released to Eagle Harbor and Puget Sound during in-water construction activities including construction of the new perimeter wall, sediment dredging and capping activities.
40 CFR 131.36(b)(1) as applied to Washington, 40 CFR 131.36(d)(14), Toxics Criteria for Those States Not Complying with Clean Water Act	Establishes numeric water quality criteria for priority toxic pollutants for the protection of human health and aquatic organisms which supersede criteria adopted by the state, except where the state criteria are more stringent than the federal criteria.	**Applicable** requirement for any discharge of water generated during construction	Would apply to any discharges of water during construction—for example, if porewater drained from dredged sediments is discharged to Eagle Harbor or Puget Sound. The FFS assumed that water generated during construction would be handled in the upland portion of the site (for example, treated in the groundwater treatment system).

Table 2-5. Chemical-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Sediment			
Amended WAC 173-204-560(2), Sediment cleanup levels WAC 173-204-560(3), Sediment cleanup objectives WAC 174-204-320, Marine Sediment Quality Standards	Requires that the sediment cleanup level be set at the sediment cleanup objective, which is defined as the **highest** of: risk-based levels, natural background, or practical quantitation level. Risk-based levels are defined as the **lowest** of: The concentration of the contaminant based on protection of human health; The concentration or level of biological effects of the contaminant based on benthic toxicity; and the concentration or level of biological effects of the contaminant estimated to result in no adverse effects to higher trophic level species. The sediment cleanup level may be adjusted upward to no higher than the cleanup screening level based on an evaluation whether it is not technically possible to achieve the sediment cleanup level and whether meeting the sediment cleanup level will have a net adverse environmental impact on the aquatic environment.	Washington SMS requirements for setting cleanup levels are **applicable** to remedy for the intertidal sediments	The selected cleanup levels for protection of the benthic community are the SMS sediment cleanup objective levels. These levels are higher than both natural background and the PQL for sediment COCs at the Wyckoff site.
WAC 173-204-560(6) "Point of compliance"	Requires that the point of compliance be established within the biologically active zone but may be established at a different location to protect human health.	Washington SMS requirements for setting points of compliance are **applicable** to the remedy for intertidal sediments.	The point of compliance for RAO 1 – Human Exposure is the top 2 feet. This is based on shellfish collection activities at the site and is the reasonable maximum depth of human exposure to intertidal sediments. For RAO 2 – Benthic Community, the point of exposure is the top 10 centimeters.

Table 2-5. Chemical-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
WAC 173-204-561, Sediment cleanup levels based on protection of human health	Sets forth requirements for human health risk-based cleanup levels set at the sediment cleanup objective. For human health noncarcinogenic effects, the sediment cleanup objective shall result in a hazard quotient of 1 and a cumulative hazard index 1 for multiple contaminants and/or exposure pathways. For individual carcinogens, the sediment cleanup objective cleanup level shall result in an estimated lifetime excess cancer risk of 1 x 10-6. For multiple carcinogens and/or exposure pathways exceeding 1 x 10-5 lifetime excess cancer risk, the sediment cleanup objectives shall be adjusted downward to 1 x 10-5.	Washington SMS requirements for setting cleanup levels for protection of human health are **applicable** to cleanup of nearshore sediments.	Cleanup levels for direct contact (dermal contact and incidental ingestion) were based on a tribal shellfish collector scenario as the reasonable maximum exposure. Cleanup levels for multiple carcinogens were selected based on an estimated lifetime cancer risk of 1 x 10-6. The cleanup level for the one COC that is not a carcinogen (PCP) corresponds to an HQ of 1. This RODA does not meet the MTCA/SMS requirement to develop sediment cleanup levels protective of shellfish consumers.
WAC 173-204-562, Sediment cleanup levels based on protection of the benthic community in marine and low salinity sediment	Sets forth chemical and biological criteria for the protection of marine benthic invertebrates.	**Applicable** Washington SMS requirements for setting cleanup levels for protection of benthic invertebrates relevant to cleanup of nearshore sediments.	The selected levels for protection of the benthic community are the SMS sediment cleanup objective levels.

CFR	Code of Federal Regulations	PCP	pentachlorophenol
COC	contaminant of concern	PQL	practical quantitation limit
CWA	Clean Water Act	RAO	Remedial Action Objective
EPA	U.S. Environmental Protection Agency	ROD	Record of Decision
FFS	focused feasibility study	RODA	Record of Decision Amendment
HQ	health quotient	SMS	State of Washington Sediment Management Standards
MTCA	Model Toxics Control Act	WAC	Washington Administrative Code

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Surface Water			
Federal: Clean Water Act of 1972 (Public Law 107-303), as amended; 33 USC 1251 et seq.			
State: Water Pollution Control (RCW 90.48, as amended); Water Quality Standards for Surface Waters of the State of Washington (WAC 173 201A)			
CWA, Section 404, 33 USC 1344 and Section 404(b)(1) Guidelines, 40 CFR Part 230, Guidelines for Specification of Disposal Sites for Dredged or Fill Material	CWA Section 404 regulates the discharge of dredged or fill material into waters of the U.S, including return flows from such activity. This program is implemented through regulations set forth in the Section 404(b)(1) guidelines, 40 CFR Part 230. The guidelines specify: the restrictions on discharge (40 CFR 230.10); factual determinations that need to be made on short- and long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment (40 CFR 230.11) in light of Subparts C through F of the guidelines; and findings of compliance on the restrictions (40 CFR 230.12). Subpart J provide the standards and criteria for the use of all types of compensatory mitigation when the response action will result in unavoidable impacts to the aquatic environment.	CWA Section 404 requirements are **Applicable** to in-water construction activities, including dredging and backfilling contaminated areas of the intertidal beaches and installing the new perimeter wall.	RI/FS information indicates that the remedy can be implemented in compliance with Section 404 requirements. However, more detailed remedial design information will be required to fully assess impacts and specify all requirements and controls that will need to be placed on dredging and placing backfill materials to minimize or avoid impacts. Also through the Section 404 analysis in remedial design, exact amounts of compensatory mitigation for unavoidable loss of aquatic habitat will be determined and mitigation plans developed.
CWA Section 402 and 33 USC 1342	These rules regulates discharges of pollutants from point sources to waters of the U.S. and requires compliance with the standards, limitations and regulations promulgated per CWA Sections 301, 304, 306, 307, and 308. CWA Section 301(b) requires all direct dischargers to meet technology-based requirements. These requirements include BCT application for conventional pollutants and BAT for toxic and nonconventional pollutants. Where effluent guidelines for a specific type of discharge do not exist, BCT/BAT technology-based treatment requirements are determined on a case-by-case basis using BPJ. Once the BPJ determination is made, the numerical effluent discharge limits are derived by applying the levels of performance of a treatment technology to the wastewater discharge.	These requirements are **Applicable** to any discharge of water to Eagle Harbor or Puget Sound during construction. Federal regulations apply where the requirements are more stringent than state promulgated point discharge requirements.	These regulations may be applicable if water pumped from excavation areas or drained from dredged sediments is discharged to surface water. The assumption in the FFS is that water will be processed in the upland portion of the site, for example through the current groundwater treatment plant.

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
CWA, 33 USC 1341, Section 401, 40 CFR Section, 121.2(a)(3), (4), and (5) Also see WAC 173-225-000, Federal Water Pollution Control Act--Establishment of Implementation Procedures of Application of Certification	Any federally authorized activity that may result in any discharge into navigable waters requires reasonable assurances that the activity will be conducted in a manner that will not violate applicable water quality standards by the imposition of any effluent limitations, other limitations, and monitoring requirements necessary to assure the discharge will comply with applicable provisions of CWA Sections 1311, 1312, 1313, 1316, and 1317.	**Relevant and Appropriate** CWA 401 regulations, if more stringent than state implementation regulations, require that in-water response actions that result in a discharge of pollutants comply with water quality standards by placing water quality-based conditions and other requirements deemed necessary.	Conditions and other requirements deemed necessary so that state water quality standards are not violated will be placed on any such discharge.
WAC 173-201A-510(3) (a), (b), and (c), Nonpoint source and stormwater pollution	These rules require using BMPs to prevent water quality violations caused by stormwater.	These regulations are **Relevant and Appropriate** for managing stormwater generated during construction.	The existing perimeter wall prevents the discharge of stormwater and surface water to Eagle Harbor, so activities conducted solely within the upland portion of the site are unlikely to cause water quality violations. Work outside the perimeter wall, such as material storage on the beaches during construction or the transport of sediments and capping materials between the upland portion of the site and the beaches will comply with these standards.
Air			
Federal: Clean Air Act ***State: Washington Clean Air Act (Chapter 70.94 RCW, as amended); General Regulations for Air Pollution Sources (WAC 173 400); and Controls for New Sources of Toxic Air Pollutants (WAC 173 460)*** ***Regional: Regulations I and III, Puget Sound Clean Air Agency***			
CAA, 40 CFR Parts 50 and 52	This regulation places restrictions on air emissions from stationary and mobile sources that creates threats to human health as defined in the regulations and which may be generated from equipment used to construct the remedy.	These regulations are **Relevant and Appropriate** to evaluating how emissions may be minimized or reduced during construction of the remedy, including sediment and soil excavation and handling activities.	Remedial actions will be designed and performed in compliance with the standards.

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
WAC 173-400-040, General Standards for Maximum Emissions	All sources and emission units are required to meet the general emission standards unless a specific source standard is available. General standards apply to visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons and property, sulfur dioxide, concealment and masking, and fugitive dust.	State regulations defining methods of control to be employed to minimize the release of contaminants associated with fugitive emissions are **Applicable** to remedial actions that may generate fugitive emissions—for example, if an on-site batch plant is used to make up concrete for the new perimeter wall. These regulations would also apply to earth-moving equipment, dust from vehicle traffic, and mobile-source exhaust.	Remedial actions that have the potential to release air emissions will meet standards.
WAC 173-400-075, Emission Standards for Sources Emitting Hazardous Air Pollutants	This regulation establishes emission standards for hazardous air pollutants. Adopts, by reference, NESHAP (40 CFR 61) and appendices.	State regulations defining emission standards may be **Applicable** to remedial actions, including the cement batch plant, if used during wall construction.	Remedial actions will be designed and performed in compliance with the standards.
Regulation I and Regulation III, PSCAA, Washington CAA, 70.94 RCW	Regulation I establishes rules and standards that are generally applicable to the control and/or prevention of the emission of air contaminants from all sources within the jurisdiction of the Agency. Regulation III establishes standards to reduce the ambient concentrations of toxic air contaminants in the Puget Sound region and thereby prevent air pollution. The major requirements of this regulation are implementation of Best Available Control Technology for sources of toxic air pollutant emissions from new and existing sources.	Soil and/or groundwater remedial actions have the potential to emit emissions subject to these standards. The ASIL) are **Relevant** and **Appropriate** for use in the air monitoring program during construction.	Remedial actions will be designed and performed in compliance with the standards
Solid and Dangerous Waste			
State: Washington Hazardous Waste Management (RCW 70.105, as amended)/Washington Dangerous Waste Regulations (WAC 173-303)			
WAC 173-303-016, Identifying Solid Waste"	This regulation Identifies those materials that are and are not solid wastes and identifies those materials that are and are not solid wastes when recycled.	Solid waste identification requirements are **Applicable** to solid wastes generated during remedial actions.	Standards will be met for remediation activities
WAC 173-303-070, Designation of Dangerous Waste	This regulation establishes the requirements for determining if a solid waste is a dangerous waste (or an extremely hazardous waste), for making quantity determinations and for small quantity generators.	Hazardous waste characterization and determination is **Applicable** to wastes generated during remedial actions, such as soil contamination, sediment contamination debris that will be disposed offsite.	

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
WAC 173-303-140, Land Disposal Restrictions	This regulation establishes land disposal restrictions, including waste and applicable treatment standards determinations, and storage and disposal prohibitions.	**Applicable** to onsite management of dangerous waste generated during remedial action, including dredged sediments and sediment excavated along the alignment of the new perimeter wall.	Contaminated sediments may need to be treated to meet LDRs prior to disposal in Washington (or another state).
WAC 173-303-170, Requirements for Generators of Dangerous Waste	This regulation establishes the requirements for dangerous waste generators. Requirements for Generators of Dangerous Waste (WAC 173-303-170[3]) includes the substantive provisions of Accumulating Dangerous Waste On Site (WAC 173-303-200) by reference.	This regulation **is Applicable** to remedial actions that may generate dangerous wastes.	Remediation wastes (for example, contaminated soil, personnel protective gear, recovered NAPL) may be dangerous waste and will be managed in accord with these requirements.
WAC 173-303-200, Accumulating Dangerous Waste On Site	This regulation establishes the requirements for accumulating wastes on site. Accumulating Dangerous Waste on Site (WAC 173-303-200) includes certain substantive standards from Use and Management of Containers (WAC 173-303-630) and Tank Systems (WAC 173-303-640) by reference.	State rules establishing requirements for accumulating dangerous waste on site are **Applicable** for managing remediation wastes generated at the site including sediment contamination, contaminated debris, used personal protective equipment, and treatment chemicals.	Management of remediation wastes that are dangerous waste will comply with these requirements.
WAC 173-303-630, Use and Management of Containers, WAC 173-303-280(6), General Requirements, and WAC 173-303-610(2), (4) and (5), Closure	This regulation establishes requirements for management of dangerous waste in containers.	This standard is **Applicable** to remedial actions that involve management of dangerous waste in containers that are subject to this standard.	Remedial actions that produce or manage containers of dangerous waste will be managed to meet standards.
WAC 173-303-64690, Staging Piles	This regulation establishes the substantive requirements for temporary storage of solid, nonflowing remediation waste during remedial operations (incorporates by reference 40 CFR 264.554 requirements).	This rule is **Relevant** and **Appropriate** for management of remediation wastes including contaminated soil piles that may be generated and accumulated during construction.	Standards will be met for remediation waste.
WAC 173-303-280(6), General requirements for dangerous waste management facilities: Requirements for cleanup only facilities	This regulation establishes requirements for the protection of public safety and worker safety at hazardous waste cleanup sites, including measures to prevent exposure by members of the general public, worker safety training, accident prevention, management of surface impoundments and waste piles, and construction quality assurance planning.	This rule is **Relevant** and **Appropriate** to construction activities on the intertidal beaches including construction of the perimeter wall, and sediment excavation and capping activities; and to sediment treatment and handling prior to offsite transport.	Cleanup activities will comply with these standards.

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
State: Solid Waste Management - Reduction and Recycling (RCW 70.95, as amended); Solid Waste Handling Standards (WAC 173-350); Labeling and packaging requirements for transportation of hazardous materials (49 CFR 171)			
WAC 173-350-025, Owner Responsibilities for Solid Waste; WAC 173-350-040, Performance Standards; WAC 173-350-300, On-Site Storage, Collection, and Transportation Standards; and WAC 173-350-900, Remedial Action	This regulation establishes minimum functional performance standards for the proper handling and disposal of solid waste, not otherwise excluded. Provides requirements for the proper handling of solid waste materials originating from residences, commercial, agricultural and industrial operations, and other sources, and identifies those functions necessary to ensure effective solid waste handling programs at both the state and local level.	Requirements are **Applicable** for covered solid waste generated during implementation of remedial actions. Remedial actions that generate covered solid waste will meet standards.	Remedial actions that generate covered solid waste will meet standards.
49 CFR 171.1(b), Hazardous Material Regulations, pretransportation functions	Any person who, under contract with a department or agency of the federal government, transports "in commerce," or causes to be transported or shipped, a hazardous material shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 CFR 171-180 related to marking, labeling, placarding, packaging, and emergency response, for example.	**Applicable** to transportation of hazardous materials such as NAPL recovered from the groundwater treatment system	Hazardous materials that will be transported offsite will be handled consistent with these requirements.
Sediment Cleanup			
WAC 173-204-570, Selection of cleanup actions	Sediment cleanup actions must comply with the sediment cleanup standards, use permanent solutions to the maximum extent practicable, provide for a reasonable restoration time frame, and shall not rely exclusively on MNR or ICs and monitoring where implementing a more permanent cleanup action is possible.	Washington SMS requirements for selection of cleanup actions related to cleanup of nearshore sediments are **Applicable**.	The Selected Remedy for intertidal sediments includes dredging and capping but relies on monitored natural attenuation to achieve remedial goals outside the active cleanup areas.

Table 2-6. Action-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
WAC 220-110, *Hydraulics Project Approval Regulations* Subsections 220-110-270, *Common Saltwater Technical Provisions*, 220-110-271, *Prohibited Work Times in Saltwater Areas*, 220-110-280, *Bulkheads and Bank Protection in Saltwater Areas*, and 110-220-320, *Dredging in Saltwater Areas.*	Places restrictions on construction project in marine and freshwater environments to protect and restore fish habitat.	**Applicable** to cleanup actions in intertidal sediments.	The Selected Remedy complies to the extent feasible and includes measures to mitigate for unavoidable impacts to intertidal marine habitat.

ASIL	Acceptable Source Impact Level
BACT	best available control technology
BAT	best available technology economically achievable
BCT	best conventional pollutant control technology
BMP	best management practice
BPJ	best professional judgment
CAA	Clean Air Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
FFS	focused feasibility study
FS	feasibility study
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act
IC	institutional control
LDR	Land Disposal Restriction
MNR	monitored natural recovery
NAPL	nonaqueous-phase liquid
NESHAP	National Emission Standards for Hazardous Air Pollutants
PSCAA	Puget Sound Clean Air Agency
RCW	Revised Code of Washington
RI	remedial investigation
SMS	Washington State Sediment Management Standards
U.S.	United States
USC	United States Code
WAC	Washington Administrative Code

Table 2-7. Location-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Archaeologically or Historically Sensitive Resources			
Federal: Native American Graves Protection and Reparation Act, 25 USC 3001 through 3013 and 43 CFR 10	Requires federal agencies and museums that possess or control over Native American cultural items (including human remains, associated and unassociated funerary items, sacred objects, and objects of cultural patrimony) to compile an inventory of such items. Prescribes when such federal agencies and museums must return Native American cultural items.	If Native American human remains or cultural items associated with human remains are present and discovered during the course of remedial construction, this requirement is **Applicable**. Such a discovery at the Wyckoff site is unlikely but possible, given the long use of Eagle Harbor by the Suquamish Tribe.	EPA will coordinate with the Suquamish Tribe during the construction planning phase to determine the level of training and archaeological oversight needed during different phases of construction. EPA and the Suquamish Tribe have a signed MOU in place that describes procedures for notification and handling of any inadvertent discoveries.
Federal: National Historic Preservation Act, 16 USC 470 et seq., 36 CFR Part 800	Requires the identification of historic properties potentially affected by the agency undertaking, and assessment of the effects on the historic property and seek ways to avoid, minimize or mitigate such effects. Historic property is any district, site, building, structure, archaeological site, traditional cultural landscape, traditional cultural property, or object included in or eligible for the NRHP, including artifacts, records, and material remains related to such a property.	**Applicable** if historic properties are potentially affected by remedial activities. (Most of the former wood treating facility has already been dismantled.)	EPA will consult with the Washington SHPO, DAHP, and Suquamish Tribe prior to the start of remedial construction and will work to avoid, minimize, or mitigate the impacts of construction on any historic properties.
Federal: Archeological and Historic Preservation Act, 16 USC 469a-1	Provides for the preservation of historical and archaeological data that may be irreparably lost as a result of a federally-approved project and mandates only preservation of the data.	**Applicable** if historical and archaeological data may be irreparably lost by implementation of the remedial activities.	EPA will consult with the Washington SHPO, DAHP, and Suquamish Tribe prior to the start of remedial construction and will preserve data as required, should there be any historical or archaeological features within the construction area.
Sensitive Habitats and Protected Species			
Federal: Executive Order for Wetlands Protection, Executive Order 11990 (1977)	Requires measures to avoid adversely impacting wetlands whenever possible, minimize wetland destruction, and preserve the value of wetlands.	To Be Considered guidelines in assessing impacts to wetlands, if any, from the response action and for developing appropriate compensatory mitigation for the project. It is unlikely but possible that small areas of wetland could be impacted during realignment of the access road	Surveying for the new access road alignment will include a determination of whether wetlands are present; if they are, EPA will ensure the design preserves wetland the extent feasible.

Table 2-7. Location-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Federal: Endangered Species Act, 16 USC 1536 (a)(2), Listing of endangered or threatened species per 50 CFR 17.11 and 17.12 or designation of critical habitat of such species listed in 50 CFR 17.95	Actions authorized, funded, or carried out by federal agencies may not jeopardize the continued existence of endangered or threatened species or result in the adverse modification of species' critical habitat. Agencies are to avoid jeopardy or take appropriate mitigation measures to avoid jeopardy.	**Applicable** to remedial actions that may impact endangered or threatened species or critical habitat that are present at the site. Listed species are found at the Site, and critical habitat for Puget Sound chinook salmon, Puget Sound steelhead, three species of rockfish, and southern resident killer whales has been designated within the site.	EPA will consult with the NMFS and USFWS regarding actions to be taken, their impacts on listed species, and measures that will be taken to reduce, minimize, or avoid such impacts so as not to jeopardize the continued existence or adversely modify critical habitat. If take cannot be avoided, take permission from the Services will be obtained prior to construction.
Federal: Magnuson-Stevens Fishery Conservation and Management Act. 50 CFR 600.920	Requires federal agencies consult with NMFS on actions that may adversely affect EFH, defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."	**Applicable** because Eagle Harbor is within the Puget Sound Basin, designated as EFH for various life stages of 46 species of groundfish, three species of salmon, four coastal pelagic species, and two species of krill.	EPA will consult with the NMFS regarding actions to be taken, their impacts on EFH, and measures that will be taken to eliminate impacts on essential habitat.
Federal: Fish and Wildlife Coordination Act. 16 USC 662 and 663, 50 CFR 6.302(g)	Requires federal agencies to consider effects on fish and wildlife from projects that may alter a body of water and mitigate or compensate for project-related losses, which includes discharges of pollutants to water bodies.	**Applicable** to remedial actions in the intertidal beaches, which will disturb fish and shellfish habitat, including eelgrass habitat.	Remedial action will be designed to minimize impacts to fish and wildlife and disturbance of sensitive habitats.
Federal: Marine Mammal Protection Act, 16 USC 1361 et seq. and 50 CFR 216	Imposes restrictions on the taking, possession, transportation, selling, offering for sale, and importing of marine mammals.	**Applicable** to response actions that could harm Killer whales or other marine mammals in Eagle Harbor; may require best management practices be used for observing and avoiding contact with such species during construction of the remedy.	It is unlikely that marine mammals will be present in the area being remediated. Remedial action will include best management practices to avoid contact with marine mammals, if necessary.
Federal: Migratory Bird Treaty Act. 16 USC 703 and 50 CFR 10.12	Makes it unlawful to take any migratory bird. “Take” is defined as pursuing, hunting, wounding, killing, capturing, trapping, and collecting.	**Applicable** - may require mitigation measures to deter nesting by migratory birds on, around, or within remedial action areas and methods to protect occupied bird nests.	EPA will use best management practices for observing and avoiding contact with migratory birds during construction of the remedy.

Table 2-7. Location-Specific Applicable or Relevant and Appropriate Requirements

Regulatory Citation	Description of Regulatory Requirement	Rationale for Including	Application
Federal: Bald and Golden Eagle Protection Act 16 USC 668, 50 CFR Part 22	Protects bald and golden eagles from take, possession or transportation without a permit.	**Applicable** - may require mitigation for any disturbances to bald eagles.	If needed, remedial action work plans will include measures to minimize disturbances to bald eagles.
State: Bald Eagle Protection Rules, WAC 232-12-292 and Habitat Buffer Zone for Bald Eagles – Rules, RCW 77.12.655	Protects eagle habitat to maintain eagle populations so the species are not classified as threatened, endangered, or sensitive in Washington State.	**Applicable** - may require mitigation for any adverse impacts to eagle habitat	If needed, remedial action work plans will include measures to protect eagle habitat.
Coast and Shoreline			
Federal: Coastal Zone Management Act, 16 USC 1451 et seq.) State: Shoreline Management Act of 1971, RCW 90.58 and WAC 173-27 County: Kitsap County Shoreline Master Program (December 24, 2014) City: City of Bainbridge Island Shoreline Management Master Program (July 2014), Sections 4.1.2.4, *Impact Analysis and No Net Loss Standard*, 6.2.5(3)(c) *Conditional use: shoreline stabilization measures*, and 6.2.6, *Location and Design of Shoreline Stabilization*"	Establishes regulations, enforcement procedures, and policies for protecting and developing Bainbridge Island's shoreline areas. The City's SMP was approved by Ecology on November 26, 1996.	Policies and regulations for the shorelines of Bainbridge Island are **Relevant and Appropriate** for constructing a new perimeter wall and dredging and backfilling contaminated sediments from intertidal beaches.	Design and construction in intertidal sediments will comply with SMP requirements and include mitigation for unavoidable impacts to shoreline resources.

CFR	Code of Federal Regulations	NRHP	National Register of Historic Places
DAHP	Washington State Department of Archaeology and Historic Preservation	SHPO	State Historic Preservation Officer
Ecology	Washington State Department of Ecology	SMP	Shoreline Master Program
EFH	Essential Fish Habitat	USC	United States Code
EPA	U.S. Environmental Protection Agency	USFWS	U.S. Fish and Wildlife Service
MOU	memorandum of understanding	WAC	Washington Administrative Code
NMFS	National Marine Fisheries Service		

Table 2-8. Cost Estimate Summary

Cost Element	Quantity	Units	Unit Costs	Subtotal
Sediment Predesign Sampling				
Institutional controls	1	Lump Sum		$35,000
Waste characterization testing and evaluation	1	Lump Sum		$53,000
Sediment physical characterization and testing	1	Lump Sum		$35,000
Bench-scale testing: NAPL	1	Lump Sum		$70,000
Test excavations	1	Lump Sum		$7,000
Bathymetric survey	1	Lump Sum		$36,000
Habitat survey	1	Lump Sum		$10,000
Bench-scale testing: sediment dewatering and stabilization	1	Lump Sum		$34,000
TarGOST survey	1	Lump Sum		$78,000
Sediment Preconstruction				
Temporary fencing and security	1	Lump Sum		$109,000
Survey confirmation	1	Lump Sum		$3,000
Upland staging area/stockpile area construction	1	Lump Sum		$104,000
Sediment Construction				
Mechanical excavation pilot test	1	Lump Sum		$42,000
Cap skirts: mechanical excavation	1	Lump Sum		$151,000
Cap surface sections: mechanical excavation	8235	CY	$48	$393,000
Sediment transport to dewatering area	8235	CY	$37	$302,000
Sediment testing	1	Lump Sum		$12,000
Sediment dewatering	1	Lump Sum		$359,000
Fill material transport	8235	CY	$42	$348,000
Cap surface section installation	8235	CY	$273	$2,245,000
Cap skirt installation	1	Lump Sum		$16,000
Sediment stabilization	8235	CY	$19	$155,000
Transportation and disposal (T&D)	11068	Tons	$124	$1,373,000
Monitoring during Sediment Construction				
Air monitoring	1	Lump Sum		$16,000
Habitat and cultural monitoring	1	Lump Sum		$12,000
Final surface bathymetric survey	1	Lump Sum		$82,000
Subtotal				***$6,080,000***
Contingency		percent	30	$1,824,000
Mobilization and memobilization		percent	2	$122,000

Table 2-8. Cost Estimate Summary

Cost Element	Quantity	Units	Unit Costs	Subtotal
Construction management and oversight (excluding T&D)		percent	6	$282,000
Remedial design (excluding T&D)		percent	8	$377,000
Project management (excluding T&D)		percent	5	$235,000
Capital Cost of Intertidal Sediment Remedy [a]				**$8,920,000**
O&M (100 years)				
Physical stability, sediment chemistry, and tissue monitoring (every 5 year to Year 30; every 10 years from Year 40 to Year 100)	14	event	$46,750	$655,000
Annual inspections	100	event	$6,020	$602,000
5-Year reviews (every 5 years)	20	event	$28,400	$568,000
Cap replacement (25 percent of capped areas in North Shoal and East Beach replaced in Year 9; 25 percent of capped area of East Beach replaced in Year 30)	3	event	$2,048,000	$6,144,000
Total O&M value (rounding errors)				$7,970,000
Total present value of O&M [b]				$2,849,000
Subtotal: Capital cost + Present Value O&M—Intertidal Sediment Remedy				**$11,769,000**
Access road improvements	1	lump sum		$306,000
New Perimeter Wall [c]				
Sheet pile wall (form for concrete wall)	1	lump sum		**$13,362,000**
Reinforced concrete wall	1	lump sum		**$10,934,000**
Total capital costs (intertidal sediments, access road, and perimeter wall)				**$33,522,000**
Total Remedy (Capital Costs + Present Value O&M)				**$36,371,000**

[a] Remedial construction costs are from the FFS (CH2M, 2016a) and were calculated in 2016 dollars.
[b] Total present value calculations use a 7.0 percent discount rate, per the *Guide to Developing and Documenting Cost Estimates During the Feasibility Study* (EPA, 2000b).
[c] Costs for access road improvements and new perimeter wall are from the FFS for Upland Soil and Groundwater (CH2M, 2016b).

10.3.1 Community Acceptance

Only a few comments were received on the preferred alternative for the intertidal beaches. Commenters expressed concern with how the caps will be maintained and monitored given the possibilities for heavy flooding, beach erosion, and log-induced scour. They also questioned how perimeter drains proposed as part of upland cleanup activities might impact the beaches. A summary of the the comments received on the Proposed Plan and EPA's responses are provided in Part 3—Responsiveness Summary of this RODA.

10.3.2 State and/or Tribal Acceptance

Ecology concurs with the Selected Remedy. A copy of their concurrence letter is provided as Appendix 2A.

The Suquamish Tribe reserved the right to gather resources within Eagle Harbor and other areas of its usual and accustomed fishing area in the 1855 Treaty of Point Elliott. Treaty-reserved rights and resources are critical to the culture, health, and welfare of the Suquamish people. In the Tribe's comments on the

Proposed Plan, the Tribe stated that the Tribe's treaty-reserved right to harvest clams and other fishery resources within Eagle Harbor have been impacted from Wyckoff Site contamination releases for decades, and these releases have also affected the aquatic biota. It is important to the Tribe that the cleanup is adequate to allow safe, unrestricted tribal fish and shellfish harvests and protects the aquatic ecosystem of Treaty-reserved resources. The Tribe has been working cooperatively with EPA since the onset of the RI/FS and will to continue doing so throughout the life of the project.

10.4 Summary of the Comprehensive Environemntal Response, Compensation, and Liability Act Nine Criteria Evaluation

For the intertidal beaches, Alternative 3 was identified as the highest-ranked alternative. Alternative 2 was rejected, because it would rely too heavily on MNR, is more likely to require maintenance, and may not meet cleanup levels within 10 years. The subsurface vertical containment wall in Alternative 4 raised many concerns (for example, that erosion would expose the tops of the walls, leaving a hazard to boaters and beachgoers and affecting natural sediment transport patterns). In EPA's judgement, the potential benefit of removing a larger volume of contaminated sediment under Alternative 5 was not commensurate with its high cost, greater implementation challenges, and short-term damage to eelgrass beds and other intertidal habitat features.

11.0 Principal Threat Waste

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site whenever practicable (40 CFR 300.430[a] [1] [iii] [A]). In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or will present a significant risk to human health or the environment should exposure occur.

In the 1994 ROD for OU1, EPA determined that "The principal threat in the East Harbor is defined as subtidal sediments containing free-phase oily contamination." This determination has not changed. Sediments contaminated with oily creosote, described in this RODA as NAPL-contaminated sediments, are principal threat waste.

All active cleanup alternatives described in this RODA require excavation and/or dredging to remove NAPL-contaminated sediment from the top 2 feet of the intertidal beaches. The NAPL that remains in the beaches in present in thin, diffuse layers and "stringers" and is not amenable to collection through wells. The most effective way to remove the NAPL is to dredge the sediment. Once dredged, the sediment will be treated if necessary to reduce contaminant mobility prior to transport and disposal in a landfill. Treatment of the remaining NAPL contaminated sediment will be accomplished through the use of reactive materials in the bottom layer of the cap. Reactive materials, for example oleophillic clay or activated carbon, will reduce contaminant mobility and help ensure containment of contaminants that will be left beneath the cap. During predesign sampling, reactive materials will be tested to determine the optimum type and amount. During design, the best placement method will also be determined.

12.0 Documentation of Significant Changes to the Selected Remedy

After the Proposed Plan was issued in April 2016, three changes were made to the Selected Remedy; these are described in the following subsections.

12.1 Change 1: Cleanup Levels

In 2017, EPA issued a new cancer slope factor for benzo(a)pyrene (EPA, 2017). To ensure the cleanup decision is based on the most current scientific data, the risk assessment calculations used to determine sediment cleanup levels for direct contact and incidental ingestion (RAO 1) and the target tissue concentration for shellfish (RAO 3) were updated (EPA, 2018 unpublished). Errors previously noted by reviewers were also corrected.

12.1.1 Sediment

For sediment, this evaluation resulted in a new cleanup level for benzo(a)pyrene and cPAH TEQ. The preliminary remedial goal identified in the Proposed Plan for both of these constituents was 63 µg/kg dry weight; the final cleanup level is 366 µg/kg dry weight. These concentrations were calculated using the tribal shellfish collector scenario.

12.1.2 Tissue

No change to the target tissue concentration for cPAHs in shellfish tissue was made, because the new risk-based target tissue concentration of 0.05 µg/kg cPAH TEQ is still lower than the background concentration of 0.12 µg/kg cPAH TEQ. The target tissue concentration is the background concentration of 0.12 µg/kg cPAH TEQ.

12.2 Change 2: Intertidal Remedy—Disposition of Dredged Sediments

In the Proposed Plan, EPA presented a modification to Alternative 3 to include upland disposal of dredged sediments versus off-site disposal. In response to comments, the upland disposal modification has been dropped. Dredged sediments will be transported off-site for disposal in a landfill as described in the following section of this RODA.

12.3 Change 3: Outboard Alignment of new Perimeter Wall

In the Proposed Plan, EPA presented an inboard (landward) configuration for the new perimeter wall and an optional outboard (seaward) configuration. EPA has selected the outboard configuration, because it will reduce cost, uncertainty, and implementation challenges. The outboard alignment will result in the loss of approximately 0.2 acre of intertidal beach habitat (aquatic land) and will require mitigation. Mitigation requirements will be addressed during remedial design and construction planning.

13.0 Selected Remedy

13.1 Summary of Rationale for the Selected Remedy

Based on consideration of CERCLA requirements, the detailed analysis of remedial alternatives, and public comments, EPA has selected Alternative 3, Partial Excavation and Capping, as the interim remedy for the intertidal beaches. The Selected Remedy is described in detail below.

13.2 Description of the Selected Remedy

The Selected Remedy to address contamination remaining in intertidal beaches adjacent to the former Wyckoff facility FPA, depicted on Figure 6, will consist of the following:

- Predesign sampling to finalize remediation areas
- Active remediation (dredging and capping) of approximately 1.6 acres of sediment
- Excavation of approximately 6,600 cubic yards of NAPL-contaminated sediments from the active cleanup areas to a depth of approximately 2.5 feet
- Installation of a multilayer cap in the dredged areas, consisting of a 4- to 6-inch-thick reactive layer, an optional demarcation layer, and a 2-foot-thick habitat layer
- MNR in the 9.2-acre area outside the active treatment areas
- ICs involving establishing a uniform environmental covenant and/or deed restriction, as needed, to prevent future marine construction projects from impacting the capped portion of the beaches
- Shellfish advisories and warnings so that, until such time as contaminant concentrations in shellfish tissue are low enough to support unrestricted harvest and consumption, EPA will coordinate with the Washington DOH on the issuing and publication of shellfish consumption advisories

LEGEND

- 2012 TarGOST® Locations and Numbers (Highlighted locations indicate locations where dredging will be extended below 30 inches to the depth of contamination, if feasible.)
- June 24, 2013 and May 16, 2014 NAPL Product Seep
- Wyckoff OU-1 Focused Feasibility Study Project Area
- Amended Capping Area
- Areas for further TarGOST investigation during implementation of selected remedy

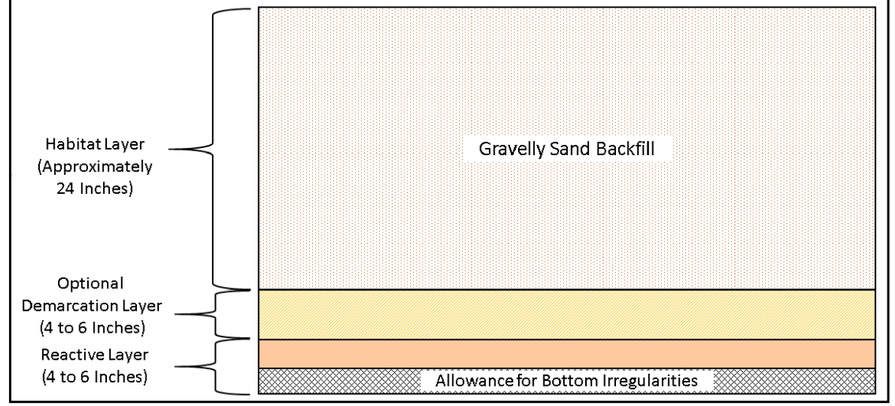
Generalized Extent of Eelgrass

- Eelgrass
- Probable Eelgrass (unconfirmed)

N

0 50 100 200 300 Feet

Conceptual Reactive Cap Construction Detail



VICINITY MAP

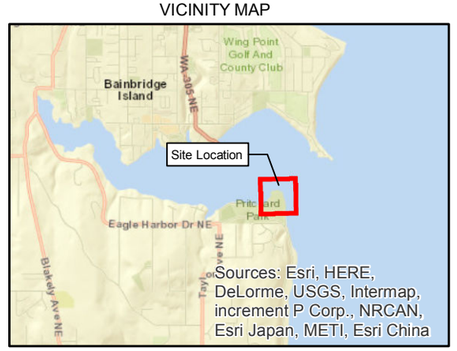


Figure 6
Selected Remedy for Intertidal Beaches
Wyckoff OU-1 ROD Amendment
Wyckoff/Eagle Harbor Superfund Site
Bainbridge Island, Washington

EPA

C:\USERS\GGEE\DOCUMENTS\GIS\WYCKOFF\MAPFILES\2018\FIGURE6.MXD GGEE 5/10/2018 12:52:29 PM

- Replacement of sections of the caps if needed in the future to maintain the remedy's protectiveness

Additional information on primary elements of the nearshore Selected Remedy is provided in the following subsections.

13.2.1 Predesign Sampling

The estimates of areas, volumes, time to reach cleanup objectives, and cost for the Selected Remedy are based on OU1 RI/FS data (CH2M, 2016a) and other information included in the Administrative Record. Additional sampling will be needed to confirm and refine the boundaries of the areas to be remediated. During predesign sampling, the extent of NAPL contamination will be confirmed using a laser-induced fluorescence probe, as described in the OU1 FFS (CH2M, 2016a). Predesign sampling will be used to delineate areas with significant NAPL contamination. In conducting this evaluation, EPA will evaluate the depth of the NAPL, thickness of the NAPL layer, and strength of the signal from the laser-induced fluorescence probe, and other factors as described in Section 4.5 of the FFS. The results will be used to define the final remediation target area. This evaluation may result in an increase in the size of the areas selected for dredging and capping. Any increase will change the excavation volume and the remedy cost and may increase the time needed for construction.

Predesign sampling will include waste characterization testing, which is needed to ensure requirements for transportation and off-site landfill disposal are met. Predesign sampling will also include baseline surveys for bathymetry, habitat conditions, and COC distribution.

13.2.2 Active Remediation: Dredging and/or Excavation and Capping

Different construction methods may be identified during design but, in the FFS, EPA assumed cleanup construction will be conducted using conventional land-based excavation equipment at low tide, when the beaches are exposed. Sediment dredging and capping/backfilling activities will be conducted in stages over small, discrete areas to allow both dredging and capping during a single low-tide cycle. Daily tides will constrain construction such that caps will need to be built in relatively small sections. In areas higher up on the beach, the daily tidal cycle likely will allow for longer working periods and larger segments to be capped at any one time.

Temporary well points or sump pumps may be needed to keep excavations dry enough to confirm removal depths and to place cap materials with sufficient accuracy. Water pumped from the dredging excavations will be handled in the upland portion of the site. Depending on the volume and quality of water generated, the water may be sent directly to the on-site groundwater treatment plant or allowed to infiltrate into the soil in a portion of the site slated for upland soil remediation.

Excavated sediment will be dewatered or stabilized as necessary then transported to an off-site landfill for disposal. Contaminated sediment will be removed to a depth of 30 inches. The excavated areas will then be backfilled with a permeable reactive cap. The cap, depicted in Figure 6, will consist of three layers:

- A 4- to 6-inch thick layer of reactive materials at the bottom of the excavated area
- An optional demarcation layer
- Clean sand and/or gravel above the demarcation layer, to match the surrounding beach substrate

The reactive layer will contain oleophilic clay or other reagents to intercept and adsorb NAPL and dissolved phase PAHs upwelling from lower depths. The demarcation layer, if and where employed, will discourage digging below it and provide a visual reference to aid future replacement or repair efforts, should they be needed. Specific materials for the reactive layer and the demarcation layer will be evaluated and selected during remedial design. The clean backfill material will be approximately 2 feet thick, restoring dredged areas to their preconstruction elevation. The top surface of the habitat layer will match the surrounding beach and will be constructed using materials with a similar grain size as the existing beach.

In four specific areas of the beach (at FFS sampling locations 2, 8, 27, and 110), NAPL extends slightly below the general excavation depth of 30 inches. In these areas, the excavation will be extended, if feasible, to the depth of NAPL contamination. Removing all the NAPL from these areas will reduce the need for replenishment of the cap's reactive layer in the future. During predesign sampling, the cleanup areas may be change. Any new areas within the final cleanup boundaries will be evaluated to determine the excavation depth. Consistent with the decision for sampling locations 2, 8, 27, and 110, sediment excavation will be extended to the depth of NAPL contamination in areas where NAPL extends slightly below the general excavation depth of 30 inches.

13.2.3 Monitored Natural Recovery

The Selected Remedy will use MNR to achieve RAOs in the areas outside the active cleanup footprint. MNR was previously selected as the remedy for the intertidal beaches in the 1994 ROD. The EPA estimated that 10 years of MNR will be required following source control actions in the upland part of the site. After the upland sheet pile wall was installed, MNR has been effective, and much of the intertidal beach area outside of the dredging and capping footprints already meets RAOs.

The Selected Remedy will remove NAPL contaminated sediments from the upper layer of the beaches and replace it with clean, imported materials. Amended materials in the bottom of the backfill layer will minimize the NAPL movement at a depth up into the cap's habitat layer. By removing NAPL, the Selected Remedy will create the conditions under which MNR can be effective. Although difficult to predict, the EPA estimates that after the additional planned remedial construction is complete, approximately 10 years of MNR will be needed to achieve cleanup levels throughout the intertidal beaches.

Monitoring of the remedy in OU1 is already being conducted, per the *Operations, Maintenance, and Monitoring Plan for OU1* (HDR and SEE, 2011). This plan will be modified as needed reflect new RAOs and cleanup measures implemented in the intertidal beaches. The monitoring program will include surveys to assess the physical stability of the intertidal beaches and visual assessment of NAPL seeps; it will also include sediment sampling to document the attainment of cleanup levels, and shellfish tissue sampling. Shellfish tissue data will be used to update the shellfish advisory as appropriate and to assess progress toward meeting the target tissue concentration.

13.2.4 Long-Term Monitoring

Because contamination will be left beneath the caps, long-term monitoring will be required to ensure the remedy remains protective. Depending on the results of the MNR sampling, the monitoring program may be revised once cleanup levels have been met, to facilitate cost-effective, long-term monitoring.

13.2.5 Institutional Controls

Restrictions on marine construction activities will be needed to protect capped areas of the intertidal beaches. This could be accomplished by implementing separate IC for the intertidal beaches, such as an environmental covenant, or by expanding the existing regulated navigation area. Shellfish consumption advisories are another important IC to protect human health. Shellfish tissue concentrations will be monitored following construction, and EPA will coordinate with the Washington DOH to ensure the advisory is updated as appropriate.

13.2.6 Future Cap Repair

The new caps do not require routine maintenance; however, the reactive media and other cap materials may require replenishing over time if breakthrough is noted during the 100-year performance monitoring period. For cost estimating purposes, 25 percent of the capped area in the North Shoal (18,000 square feet) and 25 percent of the capped area in the East Beach (18,000 square feet) are estimated to require replacement in Year 9. In addition, 25 percent of the capped area in the East Beach (18,000 square feet) will require replacement in Year 30. A second replacement event for the East Beach is included, because more persistent seeps and wave erosion are on the North Shoal.

13.3 Description of the Selected Remedy for Replacing the Perimeter Wall and Improving the Access Road

As described in Section 2.2, contaminated upland soils, mobile NAPL, and groundwater are currently contained by a perimeter steel sheet pile wall. The existing sheet pile wall was designed to be a temporary structure. A perimeter wall was needed during implementation of the steam enhanced extraction remedy selected for upland soil and groundwater in the 2000 ROD. Corrosion protection was not included in the design of the sheet pile wall, because once cleanup goals were met, the wall was assumed to be no longer needed. The wall has experienced an unusually high rate of corrosion in the intervening 17 years and is at risk of structural failure.

A new perimeter wall is needed to maintain contaminated soil and groundwater containment. As discussed in the Proposed Plan (EPA, 2016a), a new wall is also needed to support additional cleanup actions planned to address NAPL contamination remaining in upland soil and groundwater. Upland cleanup actions will be presented in a separate, forthcoming RODA for OU2 and OU4. Remedial alternatives considered by EPA for upland soil and groundwater all included a new perimeter wall as a "common element." A replacement wall is included in this RODA, which primarily addresses cleanup of the intertidal beaches, because upland soil and groundwater is a potentially significant source of contamination to the beaches. No remedy in the intertidal beaches could be effective without the continued containment provided by the perimeter wall.

The conceptual design for the new perimeter wall is a steel reinforced concrete wall. In the FFS, EPA assumed the new wall will be constructed inside the existing wall. The Proposed Plan discussed an outboard (seaward) configuration as an option. EPA has selected the outboard configuration, because building the new wall outboard of the current wall will reduce the cost, uncertainty, and implementation challenges posed by an inboard configuration. A large quantity of buried debris will need to be removed to accommodate an inboard configuration.

The new wall will be designed to contain upland soils and groundwater—both now and after additional cleanup actions planned in the upland portion of the site are implemented. The new wall also will be designed to withstand saltwater corrosion, erosive forces caused by currents, and anticipated sea level rise. The FFS assumed the new wall would be constructed by driving a second sheet pile wall parallel to the existing wall, excavating sediment from between the two walls, and installing a concrete wall between the sheet pile walls. Other installation methods or materials may be selected during remedial design.

Improvements to the access road between Eagle Harbor Drive and the FPA are also included in this RODA. The improvements, which will reduce the steep grade over a portion of the road and straighten a sharp curve, are needed to transport large construction equipment and materials to the work area.

13.4 Use of Green Remediation Practices

To the extent practicable, the remedial action should be carried out consistent with EPA's *Region 10 Clean and Green Policy* (EPA, 2009) and the *Superfund Green Remediation Strategy* (EPA, 2010), including the following practices:

- Use renewable energy and energy conservation and efficiency approaches, including Energy Star equipment.
- Use cleaner fuels, such as low-sulfur fuel or biodiesel, diesel emissions controls and retrofits, and emission reduction strategies.
- Use water conservation and efficiency approaches including Water Sense products.
- Use reused or recycled material within regulatory requirements.
- Minimize transportation of materials and use rail rather than truck transport to the extent practicable.

13.5 Summary of Estimated Remedy Costs

The total cost of the remedy is estimated to be $36,371,000. Table 2-8 summarizes the Selected Rermedy estimated costs. The information in Table 2-8 is based on the best available information regarding the anticipated scope of the remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during design. Any major changes may be documented in the form of a memorandum in the Administrative Record file, ESD, or RODA. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

13.6 Remediation Timeline

The Selected Remedy presented in this RODA can be completed within 4 years. This schedule allows a year for predesign investigation studies, a year for remedial design and planning, and 2 years for construction; it also assumes no delays in funding or contracting.

13.7 Expected Outcomes of the Selected Remedy

The intent of the Selected Remedy is, in conjunction with previous cleanup efforts in OU1, to protect human health and the environment; it is consistent with current and reasonably anticipated future uses of the beaches. The Selected Remedy is also intended to minimize reliance on fish and shellfish consumption-related ICs to the extent practicable.

The Selected Remedy will reduce contamination in the intertidal beaches to levels needed to meet the cleanup levels described in Section 8 and in Table 2-3. EPA anticipates that cleanup levels will be met within the areas selected for dredging and capping immediately following construction. In areas where MNR is the selected remedy, up to 10 years may be needed for concentrations to achieve cleanup levels.

EPA anticipates that RAO 1 – Reduce to protective levels the risk to human health posed by dermal contact and incidental ingestion of contaminated sediments in intertidal beach areas – will be met immediately after construction, which will allow safe recreational use of the beaches with no shellfish consumption. EPA also anticipates that RAO 2 – protection of the benthic community – will be met within the dredging and capping areas immediately following construction and within 10 years in MNR areas. Replacing the perimeter wall and dredging and capping activities will reduce the sources of contamination to the beaches, which will allow MNR to continue, resulting in a gradual decline in contaminant concentrations.

EPA is less certain about the ability of the selected remedy to achieve RAO 3 - the target tissue concentration in shellfish tissue. The target tissue concentration is the Puget Sound natural background concentration for shellfish tissue. Achieving this concentration in a developed urban embayment like Eagle Harbor may be difficult. Shellfish concentrations have declined since the perimeter wall was constructed, and EPA anticipates they will continue to decline following construction of the Selected Remedy. EPA will continue to monitor shellfish concentrations from the intertidal beaches and from background locations, and EPA will work with the Washington DOH to update the shellfish advisory as appropriate.

This is an interim RODA; if the remedy fails to meet cleanup levels, or shellfish tissue concentrations remain above the target concentration, and EPA determines that additional remedial action is appropriate and will further reduce contaminant concentrations, then EPA will select such action in a future CERCLA decision document.

14.0 Statutory Determinations

Under CERCLA Section 121(b)(1) and (d) and the NCP Section 300.430(f)(5)(ii), EPA must select remedies that protect human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of

hazardous wastes as a principal element and a bias against off-site disposal of untreated wastes. The following subsections discuss how the Selected Remedy meets these statutory requirements.

14.1 Protection of Human Health and the Environment

On the intertidal beaches, the remedy will protect human health and the environment through actions to dredge and remove NAPL-contaminated sediments and to backfill dredged areas with clean materials. Where NAPL will be left below the bottom of the excavation footprint, reactive materials will minimize or eliminate the upward migration of contaminants. In areas outside the dredging and capping footprint, natural recovery processes will reduce contaminant concentrations in sediment, which in turn will reduce contaminant concentrations in shellfish tissue. Replacing the perimeter wall will prevent contaminant migration from upland soil and groundwater to the beaches.

14.2 Compliance with Applicable or Relevant and Appropriate Requirements

Section 121(d) of CERCLA and the NCP §300.430(f)(l)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA §121(d)(4). Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. ARARs for the Selected Remedy are shown in Tables 2-5 through 2-7.

The most significant ARARs for in-water/nearshore cleanup work are the Washington State MTCA/SMS requirements. The Selected Remedy complies with all ARARs, with one exception. This RODA uses a target tissue concentration to measure achievement of RAO 3, rather than a sediment cleanup level as required by SMS, for the reasons described in Section 8.2.2. In a future CERCLA decision document, EPA will document compliance with this state ARAR or invoke a formal waiver pursuant to Section 121(d)(4) of CERCLA. This RODA invokes the waiver in Section 121(d)(4)(A) of CERCLA for interim remedial actions.

The selected remedy will transport waste off site for disposal and, therefore, will need to comply with applicable RCRA regulations (40 CFR 260-268). Facilities accepting these wastes must be certified to accept the wastes. RCRA LDRs apply to off-site disposal of hazardous wastes; these restrictions will be determined once the waste is characterized during remedial design. In addition to ARARs, worker safety provisions at 29 CFR 1910 will be observed.

Information in the FFS indicate that the Selected Remedy will comply with the substantive requirements of Section 404(b)(1) of the Clean Water Act and will not result in unacceptable adverse impacts to the aquatic environment. Specifically, EPA has determined the following:

- No other practicable alternatives are available that will result in less impact to the aquatic environment.
- The remedial action will not cause or contribute to violations of water quality standards or toxic effluent standards, jeopardize an endangered or threatened species or destroy or adversely modify critical habitat, or impair a protected marine sanctuary.
- The remedial action discharge will not result in significant degradation to waters of the United States.
- Potential adverse impacts to the aquatic ecosystem will be minimized (or mitigated) to the extent practicable and appropriate.

14.3 Cost-Effectiveness

The Selected Remedy is cost-effective because the remedy's costs are proportional to its overall effectiveness (see 40 CFR §300.430(f)(l)(ii)(D)). This determination was made by evaluating the overall effectiveness of those alternatives that satisfied the threshold criteria (that is, that protect human health and the environment and comply with all federal and any more stringent state ARARs, or as appropriate, waive ARARs). Overall effectiveness was evaluated by assessing three of the five balancing criteria (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness) collectively. The relationship of the overall effectiveness of the Selected Remedy was determined to be proportional to its costs and hence represents a reasonable value for the money to be spent.

The estimated present worth cost of the Selected Remedy is $36,371,000. Alternative 2 is less expensive but would take longer to achieve RAOs and more likely require future maintenance because of its smaller treatment area and greater reliance on MNR. Alternatives 4 and 5 may provide greater permanence, but these potential benefits were not outweighed by the implementability challenges and higher cost presented by these alternatives.

14.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The Selected Remedy is a permanent solution, because it removes NAPL-contaminated sediment from the marine environment and treats it using solidification as needed prior to off-site disposal. Reactive materials in the bottom layer of the cap will prevent contaminants from moving into clean material in the top of the cap. Replacing the perimeter wall will provide durable and reliable containment of upland soil and groundwater and prevent further contaminant migration to the intertidal beaches. The selected remedy complements the remedial actions already completed in OU1, which include capping of more than 70 acres of harbor sediments and a multilayer cap on West Beach. The Selected Remedy provides the best balance of trade-offs among the alternatives with respect to the balancing criteria and includes the maximum level of permanence and treatment that can be practicably used at this site.

14.5 Preference for Treatment as a Principal Element

The NCP establishes the expectation that treatment will be used to address the principal threats posed by a site whenever practicable (40 CFR 300.430[a] [1] [iii] [A]). As discussed in Section 11, EPA determined that sediments contaminated with oily creosote NAPL are principal threat waste. The NAPL that remains in the beaches is present in thin, diffuse layers and "stringers" that cannot be treated effectively in-situ. The Selected Remedy, therefore, includes dredging to remove contaminated sediments from the beaches.

Once dredged, NAPL contaminated sediment will be dewatered and the water handled in the upland portions of the site through infiltration and/or treatment in the groundwater treatment plant. The sediment will be stabilized as needed before it is transported to off-site disposal. Stabilization will reduce NAPL mobility and toxicity, but it will not destroy the contaminants or reduce contaminant volume. The Selected Remedy will leave some principal threat material in place beneath the sediment caps. The cap design includes a reactive layer that will reduce contaminant mobility and protect people and benthic organisms exposed to the cap's upper layer.

Further treatment to destroy contaminants in the dredged sediment will not be cost-effective. Additional removal of principal threat waste, evaluated in Alternative 5, was determined to be impractical due to high cost, adverse short-term impacts, and implementation challenges. The Selected Remedy will use treatment to address principal threats to the extent practicable in the intertidal beaches at the Wyckoff Site.

14.6 5-Year Review Requirements

Section 121(c) of CERCLA and the NCP §300.430(f)(5)(iii)(C) provide the statutory and legal bases for conducting 5-year reviews. Because this remedy will result in hazardous substances remaining on site above

levels that allow for unlimited use and unrestricted exposure, statutory reviews will continue to be conducted every 5 years to ensure that the remedy is, or will continue to be, protective of human health and the environment.

Appendix 2A
Washington State Department of Ecology Concurrence Letter

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

April 13, 2018

Chris Hladick, Region 10 Regional Administrator
U.S. Environmental Protection Agency
1200 6th Avenue Suite 900
Seattle, WA 98101

Re: Interim Record of Decision Amendment (Part I) for the Wyckoff/Eagle Harbor Superfund Site, Bainbridge Island, WA

Dear Mr. Hladick:

The Washington State Department of Ecology (Ecology) submits this letter as our formal concurrence to the United States Environmental Protection Agency's (EPA) Record of Decision Amendment (RODA) Part I at the Wyckoff Eagle Harbor Superfund Site (Site) - EPA ID # WAD009248295, administered under the federal Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

Ecology greatly appreciates EPA's efforts to address legacy contamination at the Site. The 1994 Record of Decision for the East Harbor Operable Unit (OU1), and the 2000 Record of Decision for the Soil and Groundwater Operable Units (OU2 and OU4), outline the efforts that EPA proposed to take.

Unfortunately, over the course of many years, continued monitoring efforts revealed that the primary remedy for OU1, capping followed by monitored natural recovery (MNR), has not been able to meet the ROD's cleanup goals. In addition, EPA has determined that while the containment remedy with a steel sheet-pile wall along the shoreline has prevented large-scale releases of oily creosote into Eagle Harbor, vital elements of this remedy are in danger of failure.

This RODA Part I, amends the 1994 Record of Decision for OU1 for portions of the intertidal beaches. In doing so, active remediation will include dredging and capping of intertidal beaches followed by 10-year long MNR. Also, due to rapid deterioration, the existing steel sheet-pile perimeter wall in the upland area will be replaced with a new reinforced concrete perimeter wall. These actions will be a significant improvement to the current conditions at the site. For these reasons Ecology concurs with the selected remedy described in RODA Part 1.

The state understands EPA's declaration that current target alternatives do not meet Model Toxics Control Act/Sediment Management Standard's (MTCA/SMS) requirements. As a result, EPA has determined that an interim RODA is the appropriate path forward at this time. Ecology appreciates EPA's commitment to conduct ongoing monitoring of tissue and sediment in the nearshore to establish target tissue concentrations during the duration of this interim RODA. This ongoing collection of data will establish a final risk-based sediment cleanup level. In addition, Ecology will continue to work with EPA for the protection of the Tribal members who consume shellfish collected at this site. Ecology will also work collaboratively with EPA to determine how MTCA/SMS requirements can be met within a future CERCLA decision document.

We acknowledge the need for additional work in OU2/4 and look forward to the future cleanup decision document - RODA (PART II) to address the remaining upland soil and groundwater contamination.

A special thanks to you and your staff for continued contributions to the cleanup.

If you have any questions please contact, Toxics Cleanup Program, Section Manager, Barry Rogowski at barry.rogowski@ecy.wa.gov or (360) 407-7226.

Sincerely,

James J. Pendowski
Toxics Cleanup Program Manager

cc: Leonard Forsman, Chairman, Suquamish Tribe
Richard Brooks, Environmental Program Manager, Suquamish Tribe
Terry Lande, Executive Director, Bainbridge Island Metro Park & Recreation District
Tom Laurie, Executive Tribal Liaison, Ecology
Denise Clifford, Government Relations Director, Ecology

Record of Decision Amendment

Wyckoff/Eagle Harbor Superfund Site
Operable Units 1, 2, and 4
Beaches and Perimeter Wall
Bainbridge Island, Washington

Part 3—Responsiveness Summary

U.S. Environmental Protection Agency, Region 10

May 2018

Part 3—Responsiveness Summary

1.0 Overview and Background on Community Involvement

This responsiveness summary summarizes significant comments submitted by the public on the U.S. Environmental Protection Agency's (EPA) April 27, 2016 *Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2, and 4)* (Proposed Plan; CH2M, 2016b); specifically, the Proposed Plan covers the following (1) Operable Unit (OU) 1 (OU1) intertidal beaches, and (2) the OU2/OU4 site access road and perimeter sheet pile wall portions of the Wyckoff/Eagle Harbor Superfund Site (Site), and EPA's response to these comments. The Proposed Plan also included clean-up actions to address soil and groundwater contamination in OU2 /OU4. EPA will issue a second Record of Decision (ROD) Amendment (RODA) to address soil and groundwater contamination before the end of 2018. That second RODA will include a responsiveness summary for the balance of comments received on the OU2/OU4 preferred alternative.

A responsiveness summary is required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 Code of Federal Regulations (CFR) § 300.430(f)(3)(F). All relevant comments summarized in this document were considered in EPA's selection of a remedy to address the nonaqueous phase liquid (NAPL) contamination present in the OU1 intertidal beaches and to replace the OU2/OU4 site access road and perimeter sheet pile wall.

The EPA worked closely with the Washington State Department of Ecology (Ecology), Suquamish Tribe, City of Bainbridge Island (the City), and other stakeholders during development of the Focused Feasibility Studies (FFSs) for OU1 (CH2M, 2016a) and OU2/OU4 (CH2M, 2016c) and the Proposed Plan to address NAPL present at the Site. Community participation played a key role in the development of the Proposed Plan and this Interim RODA.

From the time the Wyckoff/Eagle Harbor Superfund Site was added to the National Priorities List (NPL) in 1987, EPA has used a variety of outreach methods to promote stakeholder involvement. Enhanced public participation is appropriate due to the Site's complexity, geographic proximity to Puget Sound, a stakeholder who is a federally recognized Tribe with usual and accustomed fishing rights, and the Site's recognized potential as a future recreational area. Enhanced public participation has included periodic public meetings, quarterly interagency coordination calls, distribution of fact sheets and other outreach materials, postings at local gathering places and on the Washington State Ferries, email notifications, web page updates, and more. Leading up to the Proposed Plan, Ecology convened a small, local Community Interest Group which met quarterly to learn about clean-up alternatives development and to give informal input. EPA was very involved with this group, and coordinated with Ecology to deliver presentations at the meetings.

1.1 Activities before Issuing the Proposed Plan

Notice of the availability of the Proposed Plan and associated documents was published in the Bainbridge Islander on April 22, 2016, along with notice of a public meeting held on April 27. Information about the Proposed Plan and public meeting was sent by email to 553 individuals who had signed up previously to receive project updates by email. A fact sheet summarizing the Proposed Plan and announcing the public meeting (EPA, 2016b) was mailed to 875 individuals on the Site's mailing list.

Notice of the public meeting was advertised in the City's weekly community newsletter. Flyers informing the community about the public meeting were posted at the site and on community notice boards at the grocery store, the ferry terminal, local parks, the local library, and other high traffic locations. Bloomberg News ran a story about the Proposed Plan and public meeting on April 26, 2016.

1.2 Activities after Issuing the Proposed Plan

EPA held a public meeting on April 27, 2016 at the City's City Hall Council Chambers. About 50 people attended the meeting. The *Kitsap Sun* ran an article about the Proposed Plan on May 6, 2016. The public comment period for the Proposed Plan was held from April 25 until June 30, 2016. EPA extended the comment period from the 30 days required by the NCP to 60 days due to high community interest and a request from the public. The Proposed Plan, along with maps and other supporting documents, were posted on EPA's website (Soil and Groundwater Amended ROD Administrative Record). Hard copies and compact discs of the Proposed Plan, along with the OU1 FFS and the OU2/OU4 FFS, were made available at the Bainbridge Public Library, the local information repository.

2.0 Public Comments and U.S. Environmental Protection Agency Responses

This section summarizes comments received during the April 27, 2016, public meeting and during the April 25 through June 30, 2016, public comment period, along with EPA responses. Only those comments associated with EPA's preferred alternative for the OU1 intertidal beaches and EPA's preferred alternative for portions of OU2/OU4 upland area (the site access road and perimeter sheet pile wall) are included in this responsiveness summary. Comments and responses related to the remainder of the proposed remedy for upland soil and groundwater will be included in a second RODA for the site, to be issued later in 2018. Most public comments received during the public meeting and public comment period were associated with the OU2/OU4 (Upland) preferred alternative.

Section 2.1 summarizes the comments and presents EPA's response to oral comments received during the April 27, 2016 public meeting. Section 2.2 provides a comment summary and EPA's response to comments received during the public comment period associated with the OU1 intertidal beaches, while Section 2.3 present the comment summaries and EPA responses for the site access road and perimeter sheet pile wall components of the OU2/OU4 preferred alternative. Table 3-1 provides a complete comment response roadmap.

In addition to comments received from the public, comments were also received from several local and State of Washington organizations, and the Suquamish Tribe. Comment summaries and EPA responses to comments from these organizations are provided in Section 3.

Table 3-1. Comment Response Roadmap

Comment Key Points and Response Categories	Section in Responsiveness Summary Where Addressed	EPA Comment Numbers
Oral Comments Received during April 27, 2016, Public Meeting (Section 2.1)		
Supports the OU2/OU4 preferred alternative	2.1.1	Oral Comment – Speaker 1
Sheet pile wall effectiveness West Beach cleanuup and sampling frequency	2.1.2	Oral Comment – Speaker 2
OU2/OU4 preferred alternative common elements West Beach	2.1.3 2.1.2	Oral Comment – Speaker 3
Written Comments Received from the Public on OU1 (Section 2.2)		
Cap stability and repair	2.2.1	17
Written Comments Received from the Public on OU2/OU4 Site Access Road and Perimeter Sheet Pile Wall (Section 2.3)		
Supports modified Alternative 6 by reducing common elements	2.3.1	22, 32
Alternative 7 deployment—use of roads and water for equipment delivery	2.3.2	15

Table 3-1. Comment Response Roadmap

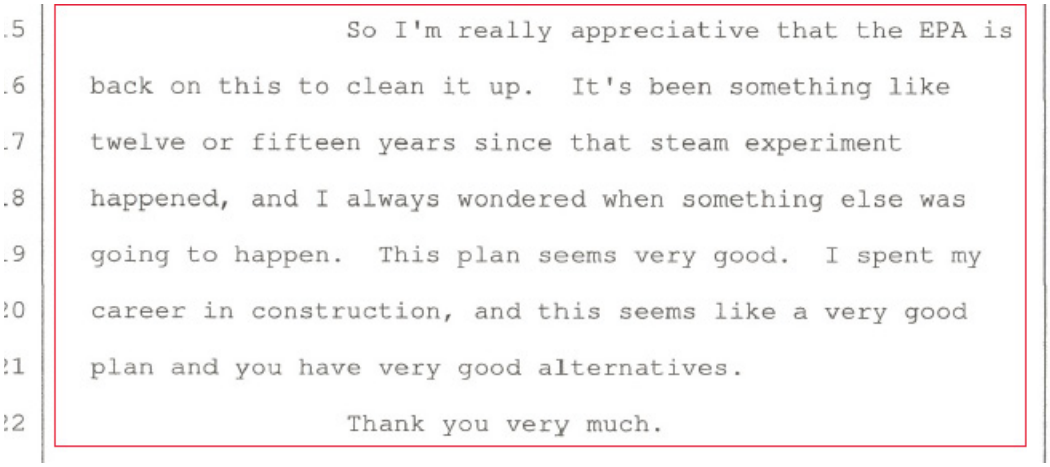
Comment Key Points and Response Categories	Section in Responsiveness Summary Where Addressed	EPA Comment Numbers
Miscellaneous topic	2.3.3	1, 2, 5, 8/21
Comments Received from State, Tribal Nations, Local Government, and Community Organizations (Section 3)		
Washington State Department of Ecology (Section 3.1)		
OU1 sediment clean-up levels	3.1.1	25
Washington State Department of Natural Resources (Section 3.2)		
Extension of the public comment period	3.2.1	
Permits and eelgrass	3.3.2	29
Squamish Tribe (Section 3.4)		
Outside perimeter sheet pile wall alignment	3.4.1	48
Shellfish target RAO	3.4.2	48
Calculation of remedial goals and residual risk	3.4.3	48
City of Bainbridge Island (Section 3.5)		
Relocation of driveway	3.5	20
Bainbridge Island Parks Foundation (Section 3.6)		
Support of concrete bulkhead design and traffic mitigation	3.6.1	34
Association of Bainbridge Communities (Section 3.7)		
Community impacts	3.7.1	30

OU operable unit
RAO remedial action objective

2.1 Oral Comment Summaries and EPA Response

This section of Part 3—Responsiveness Summary presents excerpts from the April 27, 2016, public meeting transcript for members of the public who provided comment during oral testimony and EPA's response to the comments. The full transcript from the meeting is available from EPA's project website (Soil and Groundwater Amended ROD Administrative Record). Three speakers provided comments.

2.1.1 Speaker 1: Supports OU2/OU4 Preferred Alternative



So I'm really appreciative that the EPA is back on this to clean it up. It's been something like twelve or fifteen years since that steam experiment happened, and I always wondered when something else was going to happen. This plan seems very good. I spent my career in construction, and this seems like a very good plan and you have very good alternatives.

Thank you very much.

U.S. Environmental Protection Agency Response

EPA appreciates your support for OU2/OU4 preferred alternative and replacement of the site access road and perimeter sheet pile wall, which are components of the preferred alternative.

2.1.2 Speaker 2: Operable Units 2 and 4 Common Elements and Operable Unit 1 Preferred Alternative

Speaker 2 commented on several aspects of the OU2/OU4 and OU1 preferred alternatives. Specific comments addressed under this responsiveness summary include the following:

- Sheet pile wall effectiveness.
- West Beach clean-up and beach sampling frequency.

U.S. Environmental Protection Agency Response

Following are EPA's responses regarding the two issues of the comment:

- **Sheet Pile Wall Effectiveness—**The NAPL seeps that are present on the OU1 East Beach and North Shoal are primarily attributed to residual NAPL present on the beach side of the sheet pile wall after the wall was installed in 2001. While some contaminants may be seeping through the sheet pile wall's joints, the magnitude of seepage is much less than present prior to its installation. The effectiveness of the sheet pile wall is readily apparent based on the reduced number of seeps observed, and contaminant concentration reductions observed in beach sediment over the last 10 years. Installing a replacement sheet pile wall will reduce or eliminate any seepage that is occurring through the existing wall.
- **West Beach Clean-Up and Beach Sampling Frequency—**EPA is sampling the East Beach and West Beach sediments and clam tissue every 5 years to support 5-year review protectiveness determinations. This sampling frequency is appropriate based on the rate of contaminant attenuation that has been observed. The third 5-year review that was issued in 2012, based on sampling performed in 2011, reported the following:

levels. The Intertidal Cap remains within target thickness, shows effective contaminant isolation of underlying contaminated sediments and provides habitat for a number of species. The EBS may not have achieved physical stability particularly in the lower intertidal areas with apparent losses in the lower intertidal areas and material gains in the upper intertidal zones. Additional material replacement may be required in the future to maintain physical stability. However, there are no exceedances above cleanup levels in the cover material thus showing that the EBS is effectively isolating underlying contaminated sediment. Functional habitat is observed in the North Shoal and East Beach areas. The North Shoal and East Beach have met the 10 year natural recovery goals except at two surface stations. Both the North Shoal and East Beach show continued presence of subsurface hydrocarbons. Institutional controls are in place to control contact with contaminated sediment and consumption of marine organisms in Eagle Harbor.

EPA issued the fourth 5-year review during September 2017 (U.S. Army Corps of Engineers [USACE], 2017a), using results from sediment and tissue sampling performed during 2013, 2016, and 2017. In general, the chemistry results for the intertidal cap areas were comparable with the habitat thickness layer partially depleted in some areas. Additional information on the most recent sediment and clam tissue sampling and analysis is provided in *Final 2016 Year 22 Monitoring Report* (HDR Engineering, Inc., 2017), *Clam Tissue Collection Report. Wyckoff/Eagle Harbor Superfund Site* (USACE, 2015), and *Final Clam Tissue Collection and Characterization Report. Wyckoff/Eagle Harbor Superfund Site* (USACE, 2017b).

After the OU1 intertidal beaches selected remedy was implemented, visual monitoring of the capped areas on the East Beach and North Shoals will be increased to confirm the effectiveness of sediment removal and capping. Periodic sediment and tissue sampling to support evaluation of natural attenuation rates and future 5-year reviews will also take place.

2.1.3 Speaker 3: Operable Units 2 and 4 Preferred Alternative and Other Considerations

Speaker 3 commented on multiple aspects of the OU2/OU4 preferred alternative, including the following

- Common elements, specifically the cost
- West Beach

U.S. Environmental Protection Agency Response

EPA's response is provided in the corresponding numbered responses below:

- Please see response to similar comment presented in Section 2.3.1.
- Please see EPA response to Comment 2 above in Section 2.1.2.

2.2 Operable Unit 1 Comment Summaries and U.S. Environmental Protection Agency Response

2.2.1 Comment: Cap Stability and Repair

One commenter (Comment 17) expressed concern with how the caps will be maintained and monitored given the heavy flooding, beach erosion, and log induced scouring that was observed during the 2015 and 2016 winter months.

U.S. Environmental Protection Agency Response

As described in Table 6-3 of the Draft Final OU1 FFS (CH2M, 2016a), the capped areas will be routinely monitored for evidence of erosion by periodically conducting bathymetric surveys and annual (years 1, 2, and 3) topographic surveys. Until clean-up goals have been achieved, EPA will perform the surveys and implement cap repairs, if required. The OU1 FFS assumes 25 percent of the capped area in the North Shoal area and 25 percent of the capped area in the East Beach will require repair by year 9, and 25 percent of the East Beach capped area will require repair by year 25.

2.3 Operable Units 2 and 4 Comments Associated with Site Access Road and Perimeter Sheet Pile Wall and U.S. Environmental Protection Agency Responses

The site access road and replacement of the perimeter sheet pile wall represent two of an array of common elements deemed necessary to implement the OU2/OU4 preferred alternative. Both elements are also important for implementing the OU1 selected remedy. The new access road will provide ingress and egress for the trucks needed to transport contaminated sediment off site for disposal and for equipment and materials needed to excavate contaminated sediment and install the caps. The existing sheet pile wall has experienced significant corrosion since it was installed during 2001 and must be replaced to prevent upland soil from sloughing onto the beaches and protect the integrity of the capped areas lying high up on the beach. EPA's response to comments received on the site access road and replacement perimeter sheet pile are provided in the following subsections.

2.3.1 Comments 15 and 32: Reduce Depth of Sheet Pile Wall

Comments 15 and 32 suggested that the cost of the common elements could be reduced to help offset the higher cost of Alternative 6 by decreasing the depth of the new sheet pile wall from 38 feet to 30 feet.

U.S. Environmental Protection Agency Response

The final design for the new perimeter sheet pile wall will determine the final installation depth needed. The 38-foot depth described in the Proposed Plan was based on preliminary calculations.

2.3.2 Comment Summary: Alternative 7 Deployment—Use of Roads and Water for Equipment Delivery

One commenter asked about site logistics, including using Bainbridge Island roadways (Comment 15).

U.S. Environmental Protection Agency Response

Construction of the OU1 and OU2/OU4 site access road and sheet pile wall replacement will require delivery of equipment and materials to the site using both existing local roadways to the extent practical and by water when possible. The final designs for the OU1 intertidal sediment remedy and OU2/OU4 site access road and perimeter sheet pile wall replacement will explore and identify both limits on existing road use to protect infrastructure and potential temporary and permanent means of water access.

2.3.3 Comments: Miscellaneous Topics

Several comments touched on a wide variety of topics. These comments and EPA responses have been grouped into the miscellaneous category. The comment summaries and EPA responses presented in the following subsections are presented in chronological order corresponding to the date when the comment was received with the earliest comment presented first.

2.3.4 Comment: Paying for the Clean-Up

One commenter (Comment 1) expressed a desire for Wyckoff dollars be used to pay for the clean-up.

U.S. Environmental Protection Agency Response

EPA negotiated a settlement with the Wyckoff Company in August 1994. The agreement created the Pacific Sound Resources Environmental Trust, into which the heirs of the Wyckoff Company founders, owners, and operators placed all ownership rights and shares in the company to allow the trust to maximize liquidation of all company assets, including nonwood-treating holdings, for the benefit of the environment. The beneficiaries of the trust are the U.S. Department of Interior, National Oceanic and Atmospheric Administration of the U.S. Department of Commerce, and the Suquamish and Muckleshoot Tribes, as Natural Resource Trustees, as well as EPA (Superfund trust fund) for reimbursement of Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) remedial costs. A memorandum of agreement was entered into by the beneficiaries of the Trust to ensure that settlement proceeds would be applied toward both environmental response and natural resource restoration goals (OU2/OU4 ROD; EPA, 2000). The fraction of these funds available for clean-up have been exhausted.

As indicated in the Wyckoff Proposed Plan, distributed with the April 2016 Fact sheet, federal and state taxpayers will pay for the clean-up project. Clean-up construction will be funded through a mix of 90-percent federal funds from the EPA Superfund program and 10-percent state funds from Ecology's Toxics Clean-Up Program.

2.3.5 Comment: Vegetation Clearing

Several commenters (Comments 2 and 5) expressed a desire that the scotch broom be removed.

U.S. Environmental Protection Agency Response

EPA removed vegetation, including scotch broom, from the Wyckoff upland area in 2017. Future vegetation clearing will also be performed as necessary to support construction of the various elements of the final remedy identified in this interim action RODA.

2.3.6 Comment: Vendor Materials

One commenter (Comments and 8 and 21) requested their steel pipe be used to support the clean-up effort.

U.S. Environmental Protection Agency Response

The materials required to construct the final remedy will be identified in the drawings and specifications that are prepared during remedial design. At this time, EPA is unable to specify what specific materials will need to be used.

3.0 Comments from the State, Tribes, and Local Governments and Organizations

This section includes comment excerpts or comment summaries received from the State of Washington (Ecology, Washington State Historic Preservation Officer, Department of Archaeology and Historic Preservation [DAHP], and Washington State Department of Natural Resources [DNR]), Squamish Tribe, local governments and offices (City of Bainbridge Island and Bainbridge Island Parks Foundation), and local community organizations (Association of Bainbridge Communities) and EPA's responses to the comments. Some comments are similar to those submitted and responded to in Section 2. Where this occurs, a cross reference is provided to the corresponding response in Section 2.

3.1 Washington State Department of Ecology

In their letter (Comment 25), Ecology expressed concurrence for the OU1 preferred alternative identified in the Proposed Plan. One clarifying question was expressed as described below.

3.1.1 Comment: Operable Unit 1 Sediment Clean-Up Levels

Following our recent discussion of the Proposed Plan, we have a remaining question for clarification of work proposed in OU1 (East Harbor). Please review this request to further clarify how current RAOs meet the substantive requirements of SMS as it has been proposed as an ARAR.

In Section 7.1.2 of Proposed Plan, EPA proposes Nearshore RAO (Remedial Action Objective) #4 for East Harbor as follows:

> *"Reduce levels of COCs in shellfish tissue to concentrations that protect Tribal shellfish consumers."*

Ecology supports the objectives for East Harbor of reducing contaminant concentrations in shellfish to acceptable levels for tribal consumption. Through Nearshore RAO #4, protection of human health (e.g., tribal consumers of shellfish) from bio-accumulative risks will be achieved by establishing target tissue concentrations for shellfish.

Establishment of a sediment cleanup level is considered a substantive provision and minimum requirement in the SMS framework that should be met as an applicable or relevant and appropriate requirement (ARAR) at all state and federal sites (WAC 173-204-505(5), 173-204-570(3), and 173-204-575(3)). For cleanup purposes, the goal of the SMS is to reduce exposure to sediments contaminated with chemicals from cleanup sites and sources (WAC 173-204-500(1)). Tissue concentrations can be used in a weight-of-evidence approach for determining compliance with sediment cleanup standards, and to verify the action is meeting any established tissue background concentrations (WAC 173-204-560(7)(c)).

Ecology's concern about the issue above is as follows:

> *Is "Reduction of COC levels in shellfish tissue to concentrations that protect tribal shellfish consumers" equivalent to "Reduction of sediment concentration that protect tribal shellfish consumers – background sediment concentration"?*

Please describe the process that demonstrates "equivalency of both approaches" or how the establishment of the shellfish tissue concentration that is protective of tribal shellfish consumption is more stringent than the establishment of a sediment cleanup level that is protective of both the benthic community and human health.

U.S. Environmental Protection Agency Response

The target tissue concentration for cPAHs is the background concentration of cPAHs in clam tissue collected from nonurban locations in Puget Sound. The background concentration is higher than the risk-based concentration protective of Suquamish Tribal shellfish consumers. EPA selected background as the target tissue concentration because it would not be possible to maintain tissue concentrations at levels below background.

EPA defined the sediment clean-up footprint based on RAO 1 (human health direct contact) carcinogenic polycyclic aromatic hydrocarbons (cPAHs) sediment clean-up levels. EPA anticipates that implementing the Selected Remedy will achieve the RAO 1 clean-up levels for cPAHs, as well as result in lower shellfish cPAH concentrations that will achieve nearshore RAO 3 to the extent practicable; however, at this time, the amount of reduction is uncertain. If EPA determines that a different sediment clean-up level and/or additional remedial action is needed to reduce shellfish tissue cPAH concentrations to achieve nearshore RAO 3, then EPA will select those actions in a future decision document

As explained in the RODA, because no clear relationship was found between contaminant concentrations in sediment and tissue, a protective cPAH concentration could not be derived. Therefore, EPA chose a target tissue concentration for RAO 3. EPA agrees that this does not meet the Model Toxics Control Act requirement for a sediment clean-up level that protects shellfish consumers. As described in the RODA Part 2, Section 8.2.2, this clean-up decision is an interim action. Any changes to the target tissue concentration,

selection of additional sediment clean-up levels, or additional clean-up actions will be documented in a future CERCLA decision document.

3.2 Washington State Historic Preservation Officer and Department of Archaeology and Historic Preservation

3.2.1 Comment: Documentation of Surviving Structures

Representatives of the Washington State DAHP (Comment 14) requested that any surviving Wyckoff structures be documented using DAHP's WISAARD (the Washington Information System for Architectural and Archaeological Records Data) electronic database.

U.S. Environmental Protection Agency Response

The aboveground portion of all original Wyckoff structures were demolished during early actions completed in the 1980s. Currently, there are no plans to document the belowground portion of these structures that would be demolished, including the West Dock piles proposed for removal as a potential mitigation measure to offset an outboard alignment for the replacement sheet pile wall.

3.3 Washington State Department of Natural Resources

3.3.1 Comment: Extension of the Public Comment Period

Representatives of the Washington State DNR requested that the public comment period be extended (Comment 4) past May 31, 2016.

U.S. Environmental Protection Agency Response

EPA extended the public comment period to June 30, 2016, in a notification announced on May 16, 2016.

3.3.2 Comment: Permits and Eelgrass

The Washington State DNR submitted the following comments. EPA's response is provided by the corresponding number below.

After reviewing the proposal DNR offers the following comments:

1) We understand impacts to eelgrass beds in certain areas may not be able to be avoided during the remediation process. It is DNR's hope that remedial actions taken on beaches are sufficient to remove and/or contain contaminants to level sufficient to eliminate need for re-entry at a later date.

2) DNR is encouraged by language in Section 4.4.3. Mitigation plans for eelgrass impacts need to be addressed upfront to be certain there is no net loss of habitat function from these actions (see WDFW, WAC 173-26-186 – shoreline master program, WAC 365-190-130, 220-110-280 – No Net Loss).

3) Eelgrass mitigation plans should weigh whether natural recruitment will take place, where mitigation stock should be planted, where it should be acquired, whether re-establishment will be an issue and take into account temporary loss when developing mitigation goals and objectives. We need to ensure that, at minimum, previous density and area of coverage are achieved and that sufficient restoration, maintenance and monitoring is implemented to ensure this success.

4) DNR eelgrass experts can assist with plans to salvage eelgrass from removal areas, develop monitoring plans for remaining eelgrass beds, develop mitigation/restoration goals and objectives, as well as monitoring plans to ensure these goals and objectives are met.

5) Proposal states that a new wall will be constructed inside the existing wall yet in previous discussions I have been told this may not be able to be accomplished due to presence of large debris placed inside the wall. We support and prefer the plan as proposed.

    a. If during the design phase it is determined that the new concrete wall has to be built outside the existing wall, the hydrodynamics should be modelled (e.g., wave energy, water reflection, etc.) to assess potential and/or likely impacts to existing eelgrass beds. Any negative impacts to eelgrass beds should be accounted for in an eelgrass mitigation plan developed prior to implementation of remedial action. We ask that EPA consult with our eelgrass experts (as they have done in the past) to develop the eelgrass assessment and mitigation plan.

6) In regards to impacts to SOAL and need for a use-authorization from DNR:
    - The Wyckoff OU-1 Focused Feasibility Study Area includes tidelands only, with the water ward limit crossing back and forth over the 0.0 contour (see Figure 2-2).
    - Based on the NAPL concentrations (Figure 3-6 and Figure 3-7) and proposed remedial action, there does not appear to be any dredging/capping extending below perhaps -1.0 MLLW (at the NW area of the North Shoal).
    - The tidelands are not SOAL. Non-SOAL tidelands extend to extreme low tide (-4.5 MLLW). Therefore, the proposed remedial actions (dredging/capping/sheet pile wall) as proposed in the study area would not require a DNR use authorization, however, it is unclear whether the outfall would extend onto SOAL.

- The proposed remedial action relies heavily on barge use. The presence of barges on SOAL – as they will likely be moored nearby for long periods of time and not be "in navigation" – would require a DNR use authorization in the form of a **right of entry** (a license that conveys no property rights).
- The principal habitat stewardship measure DNR would likely require include locating, mooring, and moving the barges to:
  -avoid/minimize grounding (objective: avoid crushing benthic organisms),
  -avoid/minimize the need to spud down/anchor in eelgrass (objective: avoid damaging native submerged aquatic vegetation), and
  -avoid/minimize the duration of shading from extended barge moorage at any one location over eelgrass (objective: avoid damaging native submerged aquatic vegetation).

- Should an outfall extend onto SOAL now or in the future EPA would need to work with DNR and long-term manager of this site/outfall (most likely City of Bainbridge) to develop an easement for this outfall.
- EPA should apply to the local DNR office (Orca-Straits District; 5310 Eaglemount Rd.; Chimacum, WA 98325) for a use authorization for the barges and, if necessary, easement for the outfall.

7) Regardless of whether outfall extends onto SOAL discharge from this outfall could negatively affect sediment quality of SOAL. DNR asks that we be kept informed of any exceedances detected from monitoring results and ask that increased treatment and/or proposed Phase II remedial action be implemented sooner than later should significant and/or ongoing exceedances occur.

U.S. Environmental Protection Agency Response

1. Depending on the results of the topographic and bathymetric surveys, reentry to perform cap repairs may be required in the future.

2. A mitigation plan will be developed during remedial design and implemented during the remedial action phase of the project.

3. See response to Comment 2.

4. Squamish Tribe and DNR participation in the development and review of the eelgrass mitigation plan would occur during remedial design. DNR is welcome to provide oversight of mitigation activities during the remedial action at its own expense.

5. EPA will evaluate the need for hydrodynamic modeling of an outside wall alignment during remedial design.

6. Numbers 1, 2, and 7: No response required.

   – Number 3—The need for DNR use authorization for the new outfall will be determined during remedial design once a final alignment and termination point are determined.

   – Numbers 4 and 5—EPA will evaluate barge use for transporting large equipment and materials to the site during remedial design. If barging is specified in the bid documents, then EPA will coordinate with DNR on use authorization requirements.

   – Bullet 6—The need for an easement for the new outfall will be determined during remedial design once a final alignment and termination point are determined.

7. Groundwater treatment plant (GWTP) outfall discharge monitoring results can be obtained from future discharge monitoring reports, and EPA expects that future outfall discharges will comply with current and/or new National Pollutant Discharge Elimination System (NPDES) permit limits. At this time, whether the passive groundwater treatment and discharge system outfalls would be included within the NPDES permit is not known, because they will likely discharge below the mudline. However, this will be evaluated further during remedial design. GWTP outfall discharge monitoring results are unlikely to play a significant role in Phase II remedial action decision-

making. However, discharge from the passive groundwater treatment and discharge systems will play an important role in Phase II remedial action decisions.

3.4 Suquamish Tribe

In their letter (Comment 48), the Tribe generally expressed concurrence with the OU1 Beach preferred alternative identified in the Proposed Plan. Several clarifying questions related to implementing the perimeter sheet pile wall were asked as described below.

3.4.1 Comments: Implementation of the Perimeter Sheet Pile Wall

In the preferred alternative, the alignment of the new reinforced concrete wall was modified from the inside to the outside of the existing sheet pile wall (Section 10.2.1). The Tribe's preference is the inside alignment to avoid aquatic habitat impacts. In addition to the loss of beach habitat, the Tribe is concerned of potential impacts the outside alignment may have on eelgrass beds, shoreline structures and processes, and fishery resources. In the event EPA decides to move forward with an outside alignment, mitigation is required for the loss of beach habitat and for all impacts that are associated with this action.

U.S. Environmental Protection Agency Response

EPA recognizes that an outside wall alignment would require mitigation to offset losses and included a mitigation allowance in the cost estimate for Upland Alternative 7. During remedial design, EPA will coordinate closely with the Tribe to develop and design a construction approach that minimizes adverse impacts to existing resources.

3.4.2 Comments: Nearshore Area - Implementation of the Beach Preferred Alternative and Shellfish Target Tissue Remedial Action Objective

The Tribe supports the partial excavation and capping alternative (Nearshore Alternative 3), and the RAOs proposed for the East Harbor Operable Unit. The Tribe, however, does not support the optional modification of Nearshore Alternative 3 (Section 10.2.2), in which contaminated soils from the beach would be treated using ISS technology and buried under the final on-site upland cap. The Tribe requests that contaminated sediments are disposed of at an off-site facility (i.e., landfill).

The Suquamish Tribe strongly supports the use of a shellfish target tissue concentration (Section 7.2.3) to assess the effectiveness of remedial actions in meeting the RAOs. It is important that response actions are implemented and assessed in order for the Tribe to be able to exercise its Treaty-reserved right to harvest clams and other fishery resources. The use of site-specific horse clam data collected from nonurban background location(s) to develop the target tissue concentration for carcinogenic PAHs is the Tribe's preferred approach.

U.S. Environmental Protection Agency Response

The upland disposal modification has been dropped. Contaminated sediments dredged from the intertidal beaches will be transported off site for disposal in a landfill. As described in the RODA, Part 2, Section 8.2.2, EPA will continue to monitor tissue concentrations at the site and collect shellfish from background locations to develop a more robust background data set.

3.4.3 Comment: Nearshore Area – Calculation of Remedial Goals and Residual Risk Estimates

The Tribe requests that the above-referenced document be modified to include better delineation of Tribal fisher and recreational beach user exposure assumptions and estimated risks, correction of missing information in the tables, and removal of parameters that are not applicable to the Wyckoff site. The Tribe requests an opportunity to review the modified document before it is finalized.

U.S. Environmental Protection Agency Response

EPA revised the risk assessment calculations before issuing the RODA amendment. Changes to the sediment clean-up levels that resulted are described in Section 12 of the RODA. In the revised memo, EPA corrected errors noted by reviewers from the Suquamish Tribe and Ecology. EPA also included missing information in the tables.

3.5 City of Bainbridge Island

3.5.1 Local Community Impacts

In their letter (Comment 20), the City requested the following:

> As you move forward with your efforts at this site, whatever alternative is ultimately chosen, we trust EPA will make a major effort to mitigate the effects of its work on the local community. Such mitigation should reasonably include financial support for improvements for bicycle and pedestrian safety on Eagle Harbor Drive in consideration of the increased truck traffic attendant to the work. Relocation of the east driveway so that the eastern slope of Pritchard Park is better protected, and provision of ADA access just south of the containment area would also be reasonable mitigation efforts.

U.S. Environmental Protection Agency Response

During the remedial design and remedial action construction phases of the project, EPA will coordinate closely with its contractors to develop a transportation plan that minimizes trips along Eagle Harbor Drive. Using Superfund clean-up financial resources for bicycle and pedestrian safety enhancements may not be allowable; however, EPA will work with the City to identify state and/or federal grants for such projects. Pursuing these grants and, if successful, implementing the associated project(s) would be the responsibility of the City. Additionally, responsibility for implementing provisions for Americans with Disabilities Act access would also lie with the City during the design and construction of the aboveground portion of the park.

As indicated in Section 8.1.1 of the Proposed Plan, improvements to the access road between Eagle Harbor Drive and the Wyckoff Upland area will be designed and constructed. EPA will coordinate with its remedial design contractor and the City to assure that the road alignment and grade support the Upland area's future reuse as a park.

3.6 Bainbridge Island Parks Foundation

3.6.1 Consistency with Parks Plans

The Bainbridge Island Parks Foundation joins members of the community and the City in supporting a concrete bulkhead with design options similar to the new Seattle seawall—more attractive visually and ecologically than a steel sheet wall. Along with others in the community, we encourage having the remedy include mitigation for the clean-up traffic impacts, including transporting and delivering materials by barge and Eagle Harbor Drive improvements to accommodate pedestrians and bicyclists. We also encourage redesigning the entry road to consider future park use to optimize community use of the park's eastern bluff and provide eventual Americans with Disabilities Act with improved emergency access to the beach and point at Pritchard Park.

U.S. Environmental Protection Agency Response

Please see Section 3.4.3 for EPA response to similar comments received from the City.

3.7 Association of Bainbridge Communities

3.7.1 Comment: Community Impacts

The Association of Bainbridge Communities (Comment 30) requested the following as they relate to the selected remedy for OU1, new site access road, and replacement perimeter sheet pile wall:

1. Update the 2009 Agency for Toxic Substances and Disease Registry (ATSDR) Report (ASTDR, 2009).

2. Have the chosen alternative incorporate the following:
   - Vibration device for advancing new sheet pile to minimize noise
   - Barges to be used to transport materials and equipment to the site to minimize local traffic
   - Lowered height of the new bulkhead or sloped beach to produce a more natural shoreline appearance
3. Document the clean-up be documented with words and photos to serve as a reminder that Superfund sites can be reclaimed and avoided by simple acts of prevention.
4. Include ABC and Pritchard Park Advisory Design Committee representatives in the entrance road and overall clean-up design.

U.S. Environmental Protection Agency Response

EPA responses to the numbered comments above are provided by corresponding number below:

1. The 2009 ASTDR Report has not been updated, and a future update has not been scheduled. As noted in the 2009 report: "The West Beach and the Hillsides areas are safe for unlimited normal recreational activities such as hiking, running, digging, sunbathing, playing ball, etc. Care should be taken to ensure that children do not dig through the layer of rock/cobbles above the plastic sheeting recently placed below the beach surface by EPA. This layer separates clean sand from the contaminated soil/sediments below."

   The 2009 ASTDR Report also notes: "The current data indicate that swimming in Eagle Harbor does not present a health risk from chemical contaminants."

   Current site conditions are similar to those present in 2009, therefore, the CDC findings are still applicable. EPA also conducts 5-year reviews to evaluate current and future protectiveness at Superfunds sites where contaminants are present at levels that prevent unrestricted use/unrestricted exposure. The last 5-year review, which was completed in 2017, noted that the exposure barrier system on the West Beach is eroding in places and should be further evaluated to inform replenishment needs and timing. .
2. Once EPA selects a final remedy for OU2/OU4 and begins remedial design, the subcontract bid documents will likely indicate preferences for using vibratory equipment to advance sheet pile during construction of the new bulkhead and using barges to transport large equipment and materials. The bulkhead height will be controlled by geotechnical factors, and therefore, lowering it might not be possible. However, once design for the bulkhead begins, EPA will hold public meetings to present conceptual designs and to seek input from the public on the final design.
3. Yes, implementation of the OU2/OU4 and OU1 remedies will be documented in a construction completion report that will include a photographic and narrative chronology.
4. Yes, EPA plans on holding public meetings through the remedial design process to seek input from ABC, Pritchard Park Advisory Design Committee, and other stakeholder representatives.

Appendix 3A
Redacted Comment Letters

Bottcher, Helen

From: (b) (6)
Sent: Sunday, June 12, 2016 5:05 PM
To: wyckoffcomments
Subject: Comments regarding Proposed Plan

Dear Helen Bottcher,

Thank you for the opportunity to comment on EPA's Proposed Plan for the Amendment of the ROD on the Eagle Harbor/Wyckoff site. As residents on the island, raising two small children, cleanup of the site is of paramount importance. We applaud EPA in its effort to address the site and we look forward to a cleanup that is accelerated and more effective in comparison to the first three decades of the site's listing on the NPL.

We have read the Proposed Plan and overall are pleased to see EPA's choice for Operable Units (OU) 1,2, and 4. However, we have some remaining questions and concerns that we would like to see addressed before EPA finalizes its decision for the Cleanup Plan. For ease, we have organized our concerns by OU.

OU 1 – East Harbor

Our main concern with the excavation and capping alternative relates to how the cap will be maintained and monitored. From our experience on the island, we recall last winter heavy rains brought significant flooding and erosion to the beaches around the island. Many beaches had logs piled up that had scoured deep channels in the shoreline. We can only imagine a winter like last would significantly disturb a sand cap. Which agency is responsible for monitoring the health of the cap once it is placed? How often will they be monitoring and what actions will be taken if the cap is found to be deteriorated in places? This is especially important if we consider that the beach will become an extension of Pritchard Park, a popular spot for kids and families on the island.

OU 2 & 4– Upland & Groundwater

We are interested to hear what discussion and planning has taken place regarding the preferred cleanup actions, including the bulkhead perimeter wall and the use of injecting concrete into the soil to immobilize contamination, in regards to a seismic event. Because a fault line runs underneath the site, it would be cavalier not to evaluate the consequence of an earthquake. If the bulkhead wall fails, how much contamination would be released into Eagle Harbor? Would the repair of the wall fall under an emergency action taken by the EPA?

Furthermore, given our placement over a fault line, is there a more aggressive cleanup we can perform on the highly contaminated aquifer so that if the barrier fails, which separates it from the lower aquifer, that aquifer is not contaminated?

We are especially concerned about the health of groundwater on the island as an island with a sole-source aquifer designation. Furthermore, Bainbridge Island is undergoing significant densification and thus increasing its water usage. Just last year, the new pool in Pleasant Beach exhausted the City's water resources in the area and had to have a new pipe fitted. Many farms surround the section of the island where the Wyckoff site is. While the island's growing water usage might seem tangential to the focused cleanup, it is relevant to consider that groundwater contamination might have the gravest impact if not aggressively targeted. Given that previous pumps were clogged because the copious amounts of NAPL released through extraction, we

urge EPA to not adopt a wait and see performance monitoring approach but to invest in utilizing the strategies suggested in Phase II of their preferred alternative.

We are interested to hear if EPA conducted any modeling of their ISS alternative and its effect on the upper aquifer. Would heavy construction and injection of cement impact the barrier that separates the lower aquifer from the upper? Lastly, can EPA please inform us whether floating LNAPL in the aquifer might re-contaminate the sediment that is being cleaned through ISS technologies?

In summation, we would like to applaud the EPA on its efforts to remediate the Eagle Harbor/Wyckoff site. While we appreciate EPA's preferred alternative, we strongly urge Phase II actions that address groundwater be subsumed under phase I actions. Furthermore, we would like to understand the extent to which EPA has planned for the consequences to the remaining cleanup fixtures on the site in the event of an earthquake. If not, we would encourage the EPA to do so.

Thank you for the opportunity to comment. We look forward to a cleaner island, thanks to your efforts!

Sincerely,

(b) (6)

Bainbridge Island, WA 98110

Bottcher, Helen

From: (b) (6)
Sent: Friday, June 24, 2016 10:06 PM
To: wyckoffcomments
Subject: Gander Comments

The following was published as a guest column in the June 24 edition of the Islander weekly newspaper:

The EPA has proposed a clean up remedy ("Alternative 7") at the Bainbridge Island Wyckoff Superfund site that binds the contamination with cement, thereby solidifying the toxic material so it does not leach into Eagle Harbor and the underlying groundwater. EPA acknowledges that this is not a permanent solution, meaning that the cement will eventually degrade and release the cancer-causing material to the environment at some later date. Yes, it is a short-term solution. But why would we spend an estimated $80 million dollars on a remedy that only works for a finite and ill-defined period of time, only to revert back to the current conditions of thousands of tons of leaching contamination?

Alternative 6 is a better solution, which destroys the contamination by heating it to 1100 degree F and burning off the creosote. The successful implementation of thermal destruction is a certainty, unlike the non-permanent cement solidification. Alternative 6 was eliminated primarily due to a $160 million dollar price tag that was assigned using a series of conservative assumptions, including excavation to 20 feet below ground surface. The $160M price tag can be lowered by more than 25% by focusing on the removal of hotspots identified in the Targost studies; eliminating the thermal enhanced extraction aspect of the Alternative 6 option and focusing on the slower but proven aerobic bacterial breakdown of the deeper creosote; and eliminating some of the costly aspects of the $40 million "common elements" that all of EPA's alternatives have advertised as essential remediation construction costs.

Thus, a modification of Alternative 6 will bring the price tag close to Alternative 7, and give Islanders a more permanent solution they deserve. The permanent and immediate destruction of most of the contamination hotspots will also reduce forever the leachate that will eventually resurface after the cement solidification remedy degrades over time.

We should be wary of EPA's claims of the suitability of the cement solidification remedy. In 2001, the EPA stated that the 1,800 foot steel sheet pile wall surrounding the site would last 50 years. As of 2015, less than 15 years later, the wall is badly corroded and leaking. In 2003, EPA spent millions on the failed steam injection pilot test, and have yet again resurrected this questionable technology as a "wet steam injection" aspect of Alternative 7.

These past failures illustrate the difficulty in addressing a challenging site impacted by corrosive seawater and contaminants that are by nature resistant to remediation. EPA's remedy has considerable uncertainty, and their report acknowledges that cement solidification has never been completed on a site of this size, depth, and physical conditions.

Please tell EPA you want a permanent solution by thermal destruction, not cement solidification. Send your comments regarding the Wyckoff/Eagle Harbor Proposed Plan and Feasibility Study to https://cumulis-epa.gov/super-cpad/cursites/csitinfo.cfm?id-1000612.

Melanie Keenan and Malcolm Gander, authors of the 2009 EPA-approved Bainbridge Island Sole Source Aquifer Designation

Bottcher, Helen

From: (b) (6)
Sent: Thursday, June 30, 2016 12:15 AM
To: wyckoffcomments
Cc: Skadowski, Suzanne
Subject: Gander Wyckoff Comment #4

Hello Ms. Skadowski:

Please send me a quick reply to acknowledge your receipt of this comment.
Thank you.

The purpose of this comment is to request a revision of the construction of the Alternatives presented in the April 2016 FFS regarding OU2/4. In that document, Alternative 7 (in-situ stabilization/solidification [ISS]) is presented as the preferred Alternative. I present two reasons why a revision is warranted:

1. A statement in the local newspaper by environmental professionals Janet Knox and D. Fehsenfeld point out reasons why Alternative 4, not Alternative 7, should be the recommended alternative because it actually ranks higher than Alternative 7 when using the National Contingency Plan's required Nine Balancing Criteria. I have put their statement at the bottom of this comment.

2. Alternative 6 should be modified - and can be responsibly modified - to bring the costs down to a level where the Nine Balancing Criteria assessment score for this thermal destruction-based Alternative would be higher than Alternatives 4 and 7. As I have explained elsewhere, the permanence element of Alternative 6 makes Alternative 6 the best choice, it just needs to be packaged in a reasonable way. Remember: ISS (whether it's Alternative 4 or 7) is not permanent, and the thermal destruction of Alternative 6 is permanent and is obviously superior in the Long-Term Effectiveness and Permanence criteria rating compared to Alternatives 4 or 7 (i.e., I also note that the Long-Term Effectiveness and Permanence three star rating for Alternative 7 was the same as Alternative 6 in the FFS, which appears illogical-please clarify). The thermal destruction of Alternative 6 destroys the leachate and in the long-term, significantly reduces the Operations and Maintenance costs of Alternatives 4 and 7 and also significantly reduces the project management and administrative costs of EPA/Ecology and their consultants in the long-term management of this site.

The cost of Alternative 6 ($161M) as presented in the FFS is considerably higher than the recommended Alternative 7 ($82M), and Alternative 4 ($89M). However, the Alternative 6 cost can be reduced substantially (for example) as follows:

-<u>Abandon the approximately $10M piece of Alternative 6 that employs thermal enhanced extraction (TEE).</u> This is a version of the poorly-performing steam injection pilot testing research and development adventure of 2003. Yes, we now have lessons learned and the engineers have a new plan to optimize the implementation of this technology at this complex site. I submit that not invoking TEE and simply augmenting the low-cost, passive, slower, but effective enhanced aerobic biodegradation (EAB) for contamination below soils to be treated by thermal desorption is a more responsible use of taxpayer money, i.e., as much money as possible should be used for thermal desorption.

-Abandon unnecessary portions of the $40M Common Elements costs that are not essential to a thermal destruction-based Alternative 6 preferred remedy. Approximately $9-10M can be shaved off the conservatively-constructed Common Elements if TEE is abandoned from Alternative 6, and if the focus is on removal to 15 feet below grade (not 20 feet as Alternative 6 is now presented - see next bullet below); and if the 15 foot removal depth focuses more on hotspots defined in the TarGOST characterization work. The following is a high-level overview of where costs can be reduced:

-$ 1M: Concrete Demolition, Decontamination, and Reuse;
-$ 2M: Sitewide Debris Removal;
-$ 2M: Bulkhead Debris Removal;
-$ 3.4M: Concrete Perimeter Bulkhead Wall (this money can be saved if the construction of the 1,900-foot-long wall is to
30 feet [not 38 feet]);
-$ 1M: New Outfall

-Reduce the Alternative 6 Removal Depth from 20 to 15 feet & More Efficiently Use the TarGOST Data for Hotspot Removal.

Per WAC 173-340-740(6) on page 2-1 of the FFS, applying thermal desorption to the top 15 feet of contamination along with institutional controls can reduce costs on the order of $10M. Costs will be lowered because dewatering challenges are lessened when excavating to 15 feet instead of 20 feet, thereby raising the Implementability criteria score for Alternative 6.

The three bullets above present viable ways to reduce the Alternative 6 costs on the order of $30M. A more detailed engineering analysis can be accomplished along these lines to further reduce costs that will bring the score of a modified Alternative 6 to a point where it becomes the preferred remedy. Revise the FFS accordingly.

Malcolm Gander, Ph.D., LG, LHG

Knox/Fehsenfeld Statement:

"To the editor:

We encourage everyone to submit public comments on EPA's Wyckoff/Eagle Harbor Proposed Plan and Feasibility Study (cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=1000612).

As Bainbridge Islanders and Technical Assistance Grant Committee members, we've witnessed and reviewed Wyckoff/Eagle Harbor's investigation and cleanup for almost 30 years.

As environmental geochemist and technical readers, we recognize the site's complexities and respect the EPA's willingness to reassess the preferred remedy in light of the last 15 years' technological developments, however, EPA needs public comments to encourage them to more completely clean up the site sooner.

We find that while EPA prefers Alternative 7, Alternative 4 would rank higher than Alternative 7 using the National Contingency Plan's required Nine Criteria because Alternative 4 achieves protectiveness in a shorter time frame with less impacts on the community by traffic, noise and road maintenance, returning the site to the community for use as a park sooner.

With Alternative 4, the beach cleanups can be consolidated and treated as part of the upland and then capped.

We strongly recommend seizing two valuable opportunities:

Using designs from the Seattle Seawall Project to maximize the habitat value of the new concrete bulkhead and including bicycle lanes in road upgrades for cyclist and pedestrian safety to mitigate the considerable active cleanup traffic.
Where possible, equipment and materials should be transported by barge rather than by truck via roadways.
JANET N. KNOX AND D. THOMAS FEHSENFELD"

Bottcher, Helen

From: (b) (6)
Sent: Thursday, June 09, 2016 3:21 PM
To: wyckoffcomments; Bottcher, Helen
Cc: Sherbina, Debra
Subject: EPA Proposed Plan for Wyckoff Eagle Harbor Site

To Whom It May Concern:

I have read the proposed plan for the Wyckoff Eagle Harbor Site and Plan 7 seems to be a reasonable compromise to finally achieve some cleanup. I have two concerns about the plan, one related to logistics and one related to failure of in-situ soil stabilization to retain contaminants over time.

Regardless of the cleanup plan selected, there will be a mammoth scale transport of machinery and equipment to the site. The road infrastructure on Bainbridge Island is limited, in particular Eagle Harbor Drive, and the costs to upgrade the roads before or restore them after the project is complete need to be added into the estimates. Unless something is in the plan to address the off-site infrastructure, I believe Bainbridge Islanders will become unified against any solution. There is not much to like about any plan that results in the destruction of some of the most important roads on the south end of Bainbridge.

Moving equipment and supplies to the site by water, using barges or landing craft, is an option, but it requires a pier or a hard surfaced beach ramp. A pier or ramp would need to be located carefully to provide access to deep water without sitting on top of soil requiring decontamination. All plans would be improved if acceptable location(s) of piers were identified that would be compatible with the cleanup effort associated with the particular plan. Just showing acceptable pier and ramp locations would be an indication to potential cleanup contractors that water transportation is an option. Finally, a pier remaining on the site after the cleanup could be a useful public asset.

Many of the plans use in-situ soil stabilization (ISS) rather than contaminate removal to achieve the cleanup goals. The track record of ISS seems good, but ISS is not really old technology. If the contaminants that are supposed to be immobile do not remain so after 30 or 50 years, are there options to remove them from the ISS monolith? If there are none, then even though it costs more, removing the contaminants rather than immobilizing the contaminants is preferred.

Thank you for your consideration of my comments.

(b) (6)
Bainbridge Island, WA 98110

Bottcher, Helen

From: Skadowski, Suzanne
Sent: Monday, April 25, 2016 2:20 PM
To: wyckoffcomments
Cc: Bottcher, Helen; Sherbina, Debra
Subject: Public Comment .... FW: Wyckoff clean up -Bainbridge

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From: (b) (6)
Sent: Monday, April 25, 2016 2:16 PM
To: Skadowski, Suzanne <Skadowski.Suzanne@epa.gov>
Subject: Wyckoff clean up -Bainbridge

I want to thank the staff at the EPA for the endless work you do (regretfully with significant opposition from companies that knowingly poison the world we live in....and well as uneducated general public) I believe your work to be among the most important - if not THE most important work there is.

My public comment with regard to Wyckoff clean up in Bainbridge: Wyckoff knowingly polluted our water,air and land here below us in West Seattle. I regard Wyckoff as grossly negligent and irresponsible. They should pay - for generations - WYCKOFF DOLLARS ! - for the harm they have done to our water, air and land. They can destroyed the health and well being of wildlife, humans and the planet.

I am sooooooooo angry !

Wyckoff: clean it up and pay for it !!

(b) (6)
Admiral District, West Seattle

Bottcher, Helen

From: (b) (6)
Sent: Thursday, May 12, 2016 12:51 PM
To: wyckoffcomments
Cc: (b) (6)
Subject: Scotch broom
Attachments: PastedGraphic-1.pdf; ATT00001.htm; PastedGraphic-2.pdf; ATT00002.htm

Dear clean-up site:
We hope you will get rid of the Scotch broom!!

Warmest regards, (b) (6) SAVE THIS DATE: SAT. JUNE 4, 1 to 3, to join the goats at Blakely.

For more information call (b) (6) .

Bottcher, Helen

From: (b) (6)
Sent: Friday, May 20, 2016 7:25 AM
To: wyckoffcomments
Subject: Superfund site
Attachments: PastedGraphic-2.pdf; ATT00001.htm

Hi
As (b) (6) of Weed Warriors, and instigator of many Earth Day events at Pritchard Park, I would like to have the entire Pritchard Park open. I look forward to the Point being available to the public. Ultimately, please get rid of the invasive plants, especially Scotch broom, and replace with hardy natives.

Warmest regards, (b) (6)

(b) (6)

Nonresponsive

For more information call (b) (6)

Bottcher, Helen

From: 张玲 <liz@hunantube.com>
Sent: Thursday, June 23, 2016 5:57 PM
To: wyckoffcomments
Subject: [SPAM] STEEL PIPE(PROJECT LIST FOR YOUR REF)

Dear manager,

Good day! It's Liz again from **Hunan Great Steel Co., Ltd (HGSP)**, one of the biggest steel pipes/tubes manufacturer in China.
With 22 years' experience, we have well accomplished over 100 projects worldwide annually with good reputation:

Project Area	Europe, Asia Pacific, Africa, Mid-east, America, etc				
Partial Clients	Shell Oil, CNPC, SINOPEC, SASOL, BROOKFIELD MUTIPLEX, SWCC, VISION CONSTRUCTION GROUP, etc				
Project Field	Oil & Gas	Construction	Industrial Usage	Environmental Equipment	Marine & Offshore
Live Pictures	 Pipeline transport in Iran	 Oil Pipeline Project in UAE	 Geothermal Project in Swizerland	 Coastal Chemical in U.K	 Offshore Pipeline Project in Chile
	 Oil Field in Venezuela	 Casing & Tubing in Vietnam	 Undersea Pipeline in Sudan	 Heating Supply System in Algeria	 Liquid Transportation in China

Our Advantages:

Full projects reference all of the world and vendor references from the most main Oil and Gas institute ,companies ,investors
The inspection program is full supported to the docs requirements
The list of producing equipment and inspection equipment will be provided
The relative shipping docs ,third party inspection report ,Mill test certification ,custom appreciate letters
The mill certification such as API Monogram ,ISO etc
The financial yearly reports in latest 3 years
ITP ,MPS & ISO manual
Full system of after sales records (tracking purpose)
Prices competitively level
Full presentation experiences and guidance
Engineering design &Construction capacities....

Hope our steel pipes will take you further.
Appreciate your time and hope to serve you with business. Thanks.

Best Regards
Liz Zhang
Industrial Pipe Division
Hunan Great Steel Pipe Co.,Ltd
Skype: geblizzhang
☎Tel:(0086)731-88706020 /(0086)13986059564
☎Fax:(0086)731-88678505
✉💻 www.steel-pipelines.com
Hunan Steel Industrial Zone, Tianxin Special District,Changsha City,China

Bottcher, Helen

From: Liz zhang <lizgreatpipe@163.com>
Sent: Thursday, May 26, 2016 5:38 AM
To: johns@sjr.com; vickiew@sjr.com; dariusm@sjr.com; publicrelations@takreer.com; customerservice@clmt.com; fabio.ceccarani@lyondellbasell.com; akadi@qalaaholdings.com; smurphy@qalaaholdings.com; ghammouda@qalaaholdings.com; azaky@qalaaholdings.com; wyckoffcomments; prcaccounting@placidrefining.com; margaret.haydel@placidrefining.com; prccredit@placidrefining.com; dennis.cernosek@placidrefining.com
Subject: STEEL PIPE(SMLS AND WELDED STEEL PIPE)

Dear Manager,

Good day. Greatings from "HUNAN GREAT STEEL PIPE CO.,LTD"

Glad to know that your esteemed comopany on the business of **STEEL PIPE(SMLS AND WELDED STEEL PIPE**). We "Hunan"
specialized in Manufacturing SMLS and WELD steel pipes , Pipe fittings with more than 20 years' production experiences .

Who cooperated with us?

SHELL,PEMEX(Mexico),IBERDROLA(ConstractorSpain),*PDVSA(Venezuela),*PETROBRAS(Brazil),*EIED,NIOC (Iran)and SAUDI ARABIA GAS PIPELINE,*NPDC(Nigeria),NOAC(Nigeria),*and so on.*

What's OD, WT and standard pipes we can offer?

SMLS OD: 6-914MM WALL THICKNESS : MAX 53.98 MM STANDARD: API /ASTM/EN/DIN
ERW OD: 6-610MM WALL THICKNESS : MAX 26.5 MM STANDARD: API /ASTM/EN/DIN
LSAW OD: 273-1620MM WALL THICKNESS : MAX 65 MM STANDARD: API /ASTM/EN/DIN
SSAW OD: 219-3120MM WALL THICKNESS : 3MM-25MM STANDARD: API /ASTM/EN/DIN

What's machineries does our factory equiped with?

Slight-
stretch reducing mill, rotating heat furnace, hot rolling mill, straiterner, ultrasonic and eddy current detection facility, on-line super spiral accumufator, on-line advanced straight edge case forming process, and on-line SXFJ610 Digital Rotatory cutting machine and other US made machineries.

What's kind of service we can provide with you, and why cooperate with us?

1. Full projects reference all of the world and vendor references from the most main oil and Gas in stitute, companies, investors
2. The inspection program is full supported to the docs requirements
3. The list of producing equipment and inspection equipment will be provided

4. The relative shipping docs, third party inspection report, Mill test certification, custom appreciate letters
5. The mill certification such as API monogram , ISO ect....
6. The financial yearly reports in latest 3 years
7. ITP, MPS & ISO manual
8. Full system of after sales records(tracking purpose)
9. Prices competitively level
10. Full presentation experiences and guidance
11. Engineering design & construction capacities
12. Financial supports, various of payment term could be acceptable such as L/C, T/T, OA, DP
13. Logistical and shipping chains, we have signed the yearly agreement with the main NVOCC in China can make helps the saves from shipping
14. Free custom inspection corporation & checked corporation in CCPIT
15. Full bank supported company with a perfect line of Credit "AAAAA"

Please feel free to drop me an email should our company be of your interested.

Hunan Steel Group is always your best choice from China market.

--

Best Regards
Liz Zhang
Industrial Pipe Division
Hunan Great Steel Pipe Co.,Ltd
Skype: geblizzhang
☎Tel:(0086)731-88706020 /(0086)13986059564
☎Fax:(0086)731-88678505
✉💻 www.steel-pipelines.com
Hunan Steel Industrial Zone, Tianxin Special District,Changsha City,China

Bottcher, Helen

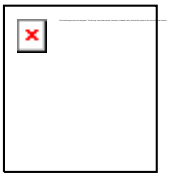
From: Griffith, Greg (DAHP) <Greg.Griffith@DAHP.WA.GOV>
Sent: Monday, June 06, 2016 1:14 PM
To: wyckoffcomments
Cc: Griffith, Greg (DAHP)
Subject: Wyckoff/Eagle Harbor Superfund Comments on Proposed Additional Cleanup Actions (DAHP log 050295-21-EPA)
Attachments: removed.txt

On behalf of the Washington State Historic Preservation Officer (SHPO) and the State Department of Archaeology and Historic Preservation (DAHP) I am providing comments on the proposed additional cleanup efforts at the Wyckoff Site.

As part of the initial phase of the cleanup, we are aware that the historic Wyckoff office and plant buildings were demolished. We do not know if the employee housing constructed as part of the company town of Creosote was demolished or are still extant. If any remain, we recommend that surviving structures be documented using DAHP's WISAARD electronic database.

Thank you and please feel free to contact me should you have any questions.

Greg Griffith
Deputy State Historic Preservation Officer
Washington State/Department of Archaeology & Historic Preservation
360-586-3073 (desk)
360-890-2617 (mobile)
POB 48343/Olympia 98504-8343
My regular office hours are Monday through Friday, 8:00 am to 5:00 pm
Get involved! Check out Washington's State Historic Preservation Plan 2014-19: Getting the Future Right at www.dahp.wa.gov



Please note that in order to streamline our responses, DAHP requires that all documents related to project reviews be submitted electronically. Correspondence, reports, notices, photos, etc. must now be submitted in PDF or JPG format. For more information about how to submit documents to DAHP please visit: http://www.dahp.wa.gov/programs/shpo-compliance.

Bottcher, Helen

From: COTHERN, SHAYNE (DNR) <SHAYNE.COTHERN@dnr.wa.gov>
Sent: Thursday, May 19, 2016 9:46 AM
To: wyckoffcomments; Bottcher, Helen
Subject: FW: EPA Seeks Public Input on Cleanup Plans for Wyckoff-Eagle Harbor Superfund Site, Bainbridge Is., WA

Helen,

We at DNR wish to comment and I am leading effort but I was wondering if I could get an extension on this comment period? The cleanup is extensive and with eelgrass issues I was hoping to receive input from Jeff Gaeckle who is currently out doing field work on Milwaukee Dock and other similar projects.

I was hoping for a mid-June deadline but at minimum an additional week would be most appreciated.

Let me know and I will plan accordingly. Call if any questions.

Thank you so much,

Shayne Cothern
DNR-Environmental Specialist
(360) 902-1064

From: Suzanne Skadowski [mailto:PRAdmin@Vocus.com]
Sent: Monday, April 25, 2016 11:35 AM
To: COTHERN, SHAYNE (DNR) <SHAYNE.COTHERN@dnr.wa.gov>
Subject: EPA Seeks Public Input on Cleanup Plans for Wyckoff-Eagle Harbor Superfund Site, Bainbridge Is., WA

Media Contact: Suzanne Skadowski, 206-553-2160, skadowski.suzanne@epa.gov

EPA Seeks Public Input on Cleanup Plans for the Wyckoff-Eagle Harbor Superfund Site on Bainbridge Island, Wash.

Public Invited to Community Meeting on April 27, Comments on Cleanup Plan Due by May 31

(Seattle – April 25, 2016) The U.S. Environmental Protection Agency has proposed a draft plan to clean up toxic creosote contamination the Wyckoff-Eagle Harbor Superfund Site, located on the east side of Bainbridge Island, Washington. The cleanup plans will address historic creosote and related chemical contamination that remains in the site's groundwater, soil, and beach. EPA is hosting a public meeting this week and will be accepting public comments on the cleanup plans until May 31.

Public Meeting

April 27, 2016: City Hall Council Chambers, 280 Madison Ave., Bainbridge Island, Wash.

5:00 – 6:30 p.m. Informal Open House and Poster Session: The EPA's project team will be available to answer questions along with state Department of Ecology officials.

6:30 – 9:30 p.m. Presentation and Public Hearing: EPA's project manager will present the proposed cleanup plan and take verbal and written public comments.

History

EPA added the Wyckoff-Eagle Harbor site to the national Superfund cleanup list in 1987 after finding creosote and other toxic wood-treating chemicals in soil, groundwater, beaches and sediment in Eagle Harbor. EPA completed multiple clean up actions over the years, but significant contamination still remains in the soil and groundwater. The site's groundwater extraction system and perimeter wall are preventing contaminants from moving into Eagle Harbor. These measures are effective but expensive, costing about $800,000 to operate each year and may take more than 100 years to meet cleanup goals. Creosote also remains in the beaches, which are closed to shellfish harvesting, and warning signs are in place to discourage beach use.

Proposed Cleanup

To address soil and groundwater contamination at the former Wyckoff wood treating facility, EPA will use a combination of cleanup technologies. Cement and other reagents will be mixed into the most heavily contaminated soil more than 50 feet below ground to prevent the contamination from moving any further. In less contaminated areas, contaminants will be extracted with new groundwater wells, and air and nutrients will be injected to speed the natural breakdown of contaminants by bacteria. Finally, a thick layer of clean soil will be placed over the soil and a new concrete perimeter wall will be built next to the existing metal wall. In the adjacent beaches, EPA will remove contaminated sediments to a depth of 30 inches and backfill with a clean sand cap designed to prevent contaminants from coming up to the beach surface. The proposed cleanup will take at least 10 years to design and build and will cost an estimated $71 to $81 million, paid for by 90 percent federal and 10 percent state funding. When cleanup is completed, the site will be incorporated into Pritchard Park.

More Information

Public comments on the proposed cleanup plan are due by May 31, 2016, to: Helen Bottcher, Project Manager; U.S. EPA Region 10 (ECL-122); 1200 6th Ave.; Seattle, WA 98101 or wyckoffcomments@epa.gov.

The cleanup plan and supporting documents are also available at the Bainbridge Public Library, 1270 Madison Ave., Bainbridge Island, WA, (206) 842-4162, and at EPA's Superfund Records Center, 1200 6th Ave., Seattle, WA, (206) 553-4494 or (800) 424-4372.

The draft cleanup plan and feasibility studies are available online at: www.epa.gov/superfund/wyckoff-eagle-harbor.

# # #

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

June 27, 2016

Attn: Helen Bottcher, RPM
U.S. EPA Region 10 (ECL-122)
1200 Sixth Avenue
Seattle, WA 98101

RE: Washington State Department of Ecology's (Ecology) comments on the Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (OU 1, 2 and 4), April 2016, prepared by US EPA R10

Dear Ms. Bottcher:

Thank you for the opportunity to provide a final review of the Proposed Plan for cleaning up contamination remaining at the Wyckoff Eagle Harbor Site. Ecology appreciates our collaborative partnership as you have led the development of the Focused Feasibility Study and Proposed Plan. As previously affirmed, Ecology supports the Proposed Plan an interim action in the upland and in-water portions of the Site.

Following our recent discussion of the Proposed Plan, we have a remaining question for clarification of work proposed in OU1 (East Harbor). Please review this request to further clarify how current RAOs meet the substantive requirements of SMS as it has been proposed as an ARAR.

In Section 7.1.2 of Proposed Plan, EPA proposes Nearshore RAO (Remedial Action Objective) #4 for East Harbor as follows:

> *"Reduce levels of COCs in shellfish tissue to concentrations that protect Tribal shellfish consumers."*

Ecology supports the objectives for East Harbor of reducing contaminant concentrations in shellfish to acceptable levels for tribal consumption. Through Nearshore RAO #4, protection of human health (e.g., tribal consumers of shellfish) from bio-accumulative risks will be achieved by establishing target tissue concentrations for shellfish.

Establishment of a sediment cleanup level is considered a substantive provision and minimum requirement in the SMS framework that should be met as an applicable or relevant and appropriate requirement (ARAR) at all state and federal sites (WAC 173-204-505(5), 173-204-570(3), and 173-204-575(3)). For cleanup purposes, the goal of the SMS is to reduce exposure to sediments contaminated with chemicals from cleanup sites and sources (WAC 173-204-500(1)). Tissue concentrations can be used in a weight-of-evidence approach for determining compliance with sediment cleanup standards, and to verify the action is meeting any established tissue background concentrations (WAC 173-204-560(7)(c)).

Ecology's concern about the issue above is as follows:

> *Is "Reduction of COC levels in shellfish tissue to concentrations that protect tribal shellfish consumers" equivalent to "Reduction of sediment concentration that protect tribal shellfish consumers – background sediment concentration"?*

Please describe the process that demonstrates "equivalency of both approaches" or how the establishment of the shellfish tissue concentration that is protective of tribal shellfish consumption is more stringent than the establishment of a sediment cleanup level that is protective of both the benthic community and human health.

Ecology understands and fully supports the EPA objective to complete the Proposed Plan and prepare the Interim ROD. We look forward to continuing to work with EPA in moving cleanup actions at Wyckoff ahead.

Sincerely,

Hun Seak Park

Hun Seak Park, Site Manager

CC: Barry Rogowski, Department of Ecology, Toxics Cleanup Program
Rich Brooks, The Squamish Tribe, Fisheries Department

WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Caring for
your natural resources
... now and forever

June 20, 2016

Helen Bottcher, Project Manager
U.S. EPA Region 10 (ECL-122)
1200 6th Ave.
Seattle, WA 98101

Subject: Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2, and 4)

Dear Ms. Bottcher,

Please accept these comments from the Washington State Department of Natural Resources (DNR) regarding the Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2, and 4).

DNR is the manager of 2.6 million acres of state-owned aquatic lands (SOAL). DNR is committed to sustainably managing the state's resources, relying on sound science, and making transparent decisions in the public's interest and with the public's knowledge throughout the environmental review and remediation process.

DNR commends EPA for its willingness to modify remedies to address deficiencies in progress towards remediation goals and to implement these proposed remedies to speed up the recovery process; the extensive investigative work conducted to develop this proposal; and the outreach efforts put forth to ensure a thorough public review process.

It is understood that this is a proposed cleanup to further address soil and groundwater contamination at the former Wyckoff wood treatment facility and that EPA is proposing to use a combination of cleanup technologies to accomplish.

We understand the plan for the upland portion of the site is to mix cement and other reagents into the most heavily contaminated soil more than 50 feet below ground with the intent to prevent the contamination from moving any further. In less contaminated areas, contaminants will be extracted with new groundwater wells, and air and nutrients will be injected with the intent to speed the natural breakdown of contaminants by bacteria, hopefully reducing the need for treatment in the passive groundwater drainage system. Finally, a thick layer of clean soil will be placed over the soil and a new concrete perimeter wall will be built next to the existing metal wall.

There will be an outfall that drains groundwater from this area and on-going monitoring will be conducted to ensure that discharge remains within the permitted levels noting that treatment will be increased as necessary to meet these levels. If discharge requirements cannot be met treatment and/or further remedial action will occur.

In the adjacent beaches, EPA will remove contaminated sediments to a depth of 30 inches and backfill with a clean sand cap designed to prevent contaminants from coming up to the beach surface.

It is understood that this is considered an interim action and that further actions may be proposed based on success of initial action to be determined by on-going monitoring and additional TarGOST studies.

After reviewing the proposal DNR offers the following comments:

1) We understand impacts to eelgrass beds in certain areas may not be able to be avoided during the remediation process. It is DNR's hope that remedial actions taken on beaches are sufficient to remove and/or contain contaminants to level sufficient to eliminate need for re-entry at a later date.

2) DNR is encouraged by language in Section 4.4.3. Mitigation plans for eelgrass impacts need to be addressed upfront to be certain there is no net loss of habitat function from these actions (see WDFW, WAC 173-26-186 – shoreline master program, WAC 365-190-130, 220-110-280 – No Net Loss).

3) Eelgrass mitigation plans should weigh whether natural recruitment will take place, where mitigation stock should be planted, where it should be acquired, whether re-establishment will be an issue and take into account temporary loss when developing mitigation goals and objectives. We need to ensure that, at minimum, previous density and area of coverage are achieved and that sufficient restoration, maintenance and monitoring is implemented to ensure this success.

4) DNR eelgrass experts can assist with plans to salvage eelgrass from removal areas, develop monitoring plans for remaining eelgrass beds, develop mitigation/restoration goals and objectives, as well as monitoring plans to ensure these goals and objectives are met.

5) Proposal states that a new wall will be constructed inside the existing wall yet in previous discussions I have been told this may not be able to be accomplished due to presence of large debris placed inside the wall. We support and prefer the plan as proposed.

    a. If during the design phase it is determined that the new concrete wall has to be built outside the existing wall, the hydrodynamics should be modelled (e.g., wave energy, water reflection, etc.) to assess potential and/or likely impacts to existing eelgrass beds. Any negative impacts to eelgrass beds should be accounted for in an eelgrass mitigation plan developed prior to implementation of remedial action. We ask that EPA consult with our eelgrass experts (as they have done in the past) to develop the eelgrass assessment and mitigation plan.

6) In regards to impacts to SOAL and need for a use-authorization from DNR:
    - The Wyckoff OU-1 Focused Feasibility Study Area includes tidelands only, with the water ward limit crossing back and forth over the 0.0 contour (see Figure 2-2).
    - Based on the NAPL concentrations (Figure 3-6 and Figure 3-7) and proposed remedial action, there does not appear to be any dredging/capping extending below perhaps -1.0 MLLW (at the NW area of the North Shoal).
    - The tidelands are not SOAL. Non-SOAL tidelands extend to extreme low tide (-4.5 MLLW). Therefore, the proposed remedial actions (dredging/capping/sheet pile wall) as proposed in the study area would not require a DNR use authorization, however, it is unclear whether the outfall would extend onto SOAL.

- The proposed remedial action relies heavily on barge use. The presence of barges on SOAL – as they will likely be moored nearby for long periods of time and not be "in navigation" – would require a DNR use authorization in the form of a **right of entry** (a license that conveys no property rights).
- The principal habitat stewardship measure DNR would likely require include locating, mooring, and moving the barges to:
  -avoid/minimize grounding (objective: avoid crushing benthic organisms),
  -avoid/minimize the need to spud down/anchor in eelgrass (objective: avoid damaging native submerged aquatic vegetation), and
  -avoid/minimize the duration of shading from extended barge moorage at any one location over eelgrass (objective: avoid damaging native submerged aquatic vegetation).

- Should an outfall extend onto SOAL now or in the future EPA would need to work with DNR and long-term manager of this site/outfall (most likely City of Bainbridge) to develop an easement for this outfall.
- EPA should apply to the local DNR office (Orca-Straits District; 5310 Eaglemount Rd.; Chimacum, WA 98325) for a use authorization for the barges and, if necessary, easement for the outfall.

7) Regardless of whether outfall extends onto SOAL discharge from this outfall could negatively affect sediment quality of SOAL. DNR asks that we be kept informed of any exceedances detected from monitoring results and ask that increased treatment and/or proposed Phase II remedial action be implemented sooner than later should significant and/or ongoing exceedances occur.

DNR appreciates the opportunity to submit comments on the Proposed Plan. Should you have any questions regarding this letter, please do not hesitate to contact me at 360-902-1064.

Sincerely,

Shayne Cothern
Site Manager, Sediment Quality Unit, Aquatics Division

cc: Kristin Swenddal, Aquatics Division Manager
Jeff Gaeckle, Nearshore Scientist
Dennis Clark, Assistant Division Manager, Orcas District

THE SUQUAMISH TRIBE

Post Office Box 498
Suquamish, WA 98392-0498
Phone (360) 598-3311
Fax (360) 394-3686

June 30, 2016

Helen Bottcher
U.S. Environmental Protection Agency
1200 Sixth Avenue, Suite 900 (ECL-113)
Seattle, WA 98101

Re: Wyckoff-Eagle Harbor Superfund Site
Proposed Plan for Amending the RODs for
Operable Units 1, 2, and 4

Dear Ms. Bottcher:

The Suquamish Tribe appreciates the opportunity to provide comments on the Proposed Plan for the cleanup alternatives proposed within Wyckoff – Eagle Harbor Superfund Site for Operable Unit (OU) 1, East Harbor Operable Unit, and OU2/OU4, Wyckoff Soil and Groundwater Operable Units.

The Suquamish Tribe is a signatory to the 1855 Treaty of Point Elliott. Under the articles of the Treaty, the Tribe ceded certain areas of its aboriginal lands to the United States and reserved various rights including the time immemorial custom to hunt, fish, and gather within its usual and accustomed grounds and stations, which was and continues to be the basis of the Tribe's source of food and culture. The Wyckoff-Eagle Harbor Superfund site is situated within the ceded territory and the adjudicated usual and accustomed fishing area of the Suquamish Tribe.

Treaty-reserved rights and resources are critical to the culture, health, and welfare of the Suquamish people. The Tribe's treaty-reserved right to harvest clams and other fishery resources within Eagle Harbor have been impacted from Wyckoff site contamination releases for decades. These hazardous substance releases have also affected the aquatic biota.

In 2008, the Tribe provided in writing its strong preference for the significant, or mass, removal of contaminants at the Wyckoff upland area, and that sediment contamination issues within the beach area of OU1 be addressed. The Tribe understands the complexities at the site and is supportive of current efforts to address these site contamination problems and to amend the record of decisions for these OUs.

The Tribe's comments on the remedial alternatives being proposed for the Upland Soil and Groundwater Operable Units and the Nearshore Area of the East Harbor Operable Unit, and on a risk assessment support document, are found below. The Tribe also acknowledges information included in the Proposed Plan on early site history (Section 3.1), and supports the language included in the document on natural habitat functions of the site (Section 4.3) and eelgrass beds (Section 4.4.3).

Upland Soil and Groundwater Operable Units (Alternatives 7 and 4)

The Suquamish Tribe supports in-situ solidification/solidification (ISS) of the core area and thermal-enhanced recovery (Upland Alternative 7), and the remedial action objectives (RAOs) proposed for the Soil and Groundwater Operable Units. However, the Tribe does have concerns associated with this alternative and requests further discussion on several common upland elements.

The timeframe for completing actions and achieving the RAOs under Alternative 7 is a concern for the Tribe. This alternative proposes 10 years of active construction followed by an additional 24 years of activities to achieve the RAOs. The Tribe requests that EPA further evaluate the schedule of actions under this alternative to reduce the timeframe needed to achieve the RAOs.

In the preferred alternative, the alignment of the new reinforced concrete wall was modified from the inside to the outside of the existing sheet pile wall (Section 10.2.1). The Tribe's preference is the inside alignment to avoid aquatic habitat impacts. In addition to the loss of beach habitat, the Tribe is concerned of potential impacts the outside alignment may have on eelgrass beds, shoreline structures and processes, and fishery resources. In the event EPA decides to move forward with an outside alignment, mitigation is required for the loss of beach habitat and for all impacts that are associated with this action.

The Tribe also requests continued discussions on the alignment and construction of the new stormwater outfall and any passive discharge of groundwater through the perimeter wall. The Tribe is concerned of water quality issues associated with these future discharges. It is important that the construction and discharge from the new stormwater outfall pipe avoids any potential impacts to shellfish growing area classifications within the Eagle Harbor area and to nearby eelgrass beds. The Tribe has spent well over a decade to upgrade the shellfish growing area classification of the Port Blakely and Tyee Shoal geoduck tracts to "Approved" for harvesting, and any negative impact to these tracts impacts the Tribe's treaty-reserved right to harvest. The Tribe also participated as an Elliott Bay Trustee Council representative on efforts to complete the nearby Milwaukee Dock eelgrass restoration project and the protection of this area is paramount.

The Tribe is considering supporting Upland Alternative 4 (ISS treatment for most of the upland area) if Tribal issues are satisfactorily and meaningfully addressed. These issues include (1) the on-site placement of a significantly larger volume of ISS-treated soils onsite, and (2) the construction and transportation requirements for the treatment of 352,000 cubic yards of soil

within a four-year construction period. A positive component of this alternative is the 12-year timeframe for completing actions required to achieve the RAOs.

Nearshore Area

The Tribe supports the partial excavation and capping alternative (Nearshore Alternative 3), and the RAOs proposed for the East Harbor Operable Unit. The Tribe, however, does not support the optional modification of Nearshore Alternative 3 (Section 10.2.2), in which contaminated soils from the beach would be treated using ISS technology and buried under the final on-site upland cap. The Tribe requests that contaminated sediments are disposed of at an off-site facility (i.e., landfill).

The Suquamish Tribe strongly supports the use of a shellfish target tissue concentration (Section 7.2.3) to assess the effectiveness of remedial actions in meeting the RAOs. It is important that response actions are implemented and assessed in order for the Tribe to be able to exercise its Treaty-reserved right to harvest clams and other fishery resources. The use of site-specific horse clam data collected from nonurban background location(s) to develop the target tissue concentration for carcinogenic PAHs is the Tribe's preferred approach.

Calculation of Preliminary Remedial Goals and Residual Goals and Residual Risk Estimates for the Wyckoff Superfund Site (April 6, 2016)

The Tribe requests that the above-referenced document be modified to include better delineation of Tribal fisher and recreational beach user exposure assumptions and estimated risks, correction of missing information in the tables, and removal of parameters that are not applicable to the Wyckoff site. The Tribe requests an opportunity to review the modified document before it is finalized.

We appreciate the opportunity to provide these comments, and look forward to our continued involvement on the Wyckoff-Eagle Harbor Superfund site.

Sincerely,

Richard Brooks
Environmental Program Manager

Cc: Hun Seak Park, Ecology

CITY OF BAINBRIDGE ISLAND

June 15, 2016

Helen Bottcher, Project Manager (ECL-122)
U.S. EPA Region 10
1200 6th Ave., Suite 900
Seattle, WA 98101

Re: Comments on the Wyckoff/Eagle Harbor Superfund Site Proposed Plan

Dear Ms. Bottcher:

The City of Bainbridge Island is grateful to the EPA for its continued efforts to remediate the Wyckoff Superfund Site, and welcomes the opportunity to comment on its new proposed clean-up actions for that site.

A number of citizens have shared with us their views of the EPA's Preferred Alternative 7, and of other alternatives, both those considered by the EPA and otherwise. For reasons contained in the public comment to you by environmental geochemist Janet Knox and renewable energy engineer Eric Moe, we are persuaded that Upland Alternative 4 is the approach that would best balance the goal of cleaning this site with other important interest of Bainbridge Islanders, including returning the site to public use at an earlier date, and minimizing the impact to the community by shortening the duration of the clean-up effort. We urge you to choose Upland Alternative 4 as EPA's preferred alternative.

As you move forward with your efforts at this site, whatever alternative is ultimately chosen, we trust EPA will make a major effort to mitigate the effects of its work on the local community. Such mitigation should reasonably include financial support for improvements for bicycle and pedestrian safety on Eagle Harbor Drive in consideration of the increased truck traffic attendant to the work. Relocation of the east driveway so that the eastern slope of Pritchard Park is better protected, and provision of ADA access just south of the containment area would also be reasonable mitigation efforts.

Thank you for your efforts, and for the opportunity to comment.

Sincerely,

Val Tollefson, Mayor

280 Madison Avenue North
Bainbridge Island, Washington 98110-1812
www.bainbridgewa.gov
206.842.7633

BAINBRIDGE ISLAND PARKS FOUNDATION

PO Box 11127
Bainbridge Is., WA 98110
www.biparksfoundation.org
206.842.4971

June 30, 2016

Helen Botcher
EPA Project Manager
U.S. EPA Region 10
1200 Sixth Avenue Suite, 900 ECL-122
Seattle, WA 98101

RE: Proposed clean-up plan for Wyckoff/Eagle Harbor Superfund Site

Dear Helen:

The Bainbridge Island Parks Foundation joins members of the community and the City of Bainbridge Island in supporting Alternative 4 of the EPA recommended cleanup options for the Wyckoff/Eagle Harbor Superfund site at Pritchard Park on Bainbridge Island.

As a nonprofit dedicated to enhancing our community by supporting a thriving system of parks, trails and open-space on Bainbridge Island, we feel that it is critical for the existing substantial contamination to be isolated from public contact at this park. The beaches at Pritchard Park are popular and the existing closure areas outside of the area contained by the sheetwall are still frequented by park visitors. Threats posed by earthquakes and increased precipitation due to climate change increase concerns. Since the Feasibility Study predicts that the completion period to be 10 years for Alternative 4 versus 24-34 years for the recommended Alternate 7, we support the former over the latter: so that the park may be safe and accessible for public use sooner. We also support Alternate 4 as it provides the opportunity for a concrete bulkhead with design options similar to the new Seattle seawall: more attractive visually and ecologically than a steel sheet wall. We support Alternative 4 for minimizing the negative traffic and noise impacts to the community.

Along with others in the community, we encourage the remedy to include mitigation for the traffic impacts of the cleanup, including the transportation/delivery of materials by barge, and Eagle Harbor Dr. improvements to accommodate pedestrians and bicyclists. We also encourage the redesign of the entry road to consider future use of the park so as to optimize community use of the eastern bluff of the park, and to provide eventual ADA and improved emergency access to the beach and point at Pritchard Park.

The BI Parks Foundation wishes to express our appreciation for the teams of individuals from the State Department of Ecology and The NW Regional Office of the EPA for their dedicated and extensive efforts to find a feasible and permanent solution to remedy the toxic contaminants at Pritchard Park. Your efforts prepare this site to be a spectacular gateway park for the enjoyment of generations to come.

Thank you,

Barbara Trafton
Executive Director

From: Association of Bainbridge Communities (ABC)
365 Ericksen Avenue, Suite 327
Bainbridge Island, WA 98110

Date: June 29, 2016

Subject:
ABC Comments on Proposed Plan for Amending the Record of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2 and 4)

To: Helen Bottcher, Project Manager
(ECL-122) U.S. EPA Region 10
1200 6th Ave., Suite 900 Seattle, WA 98101
wyckoffcomments@epa.gov

References:
1) Proposed Plan for Amending the Record of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2 and 4) EPA, April 2016
2) Citizen Comments on Wyckoff/Eagle harbor Superfund Site Proposed Plan submitted by Janet Knox June 10, 2016

Dear Ms. Bottcher:

BACKGROUND
It has been 30 years since ABC collected 2,000 signatures asking that the Wyckoff Creosote Facility be placed on the National Priorities List (NPL). This petition was delivered personally in 1986 to our then - U.S Representative in Washington DC. The following year the site was placed on the NPL. Since that time ABC has been actively representing the community on the cleanup working in coordination with EPA. In the past this included having a consultant financed via the first Region 10 Technical Assistance Grant (TAG) and writing articles in ABC's newsletter *Scotch Broom*. More recently ABC members have been serving on the Wyckofff Community Interest Group. There have been many successes and even a few failures over the intervening three decades. In the beginning the goal was for the site to be "cleaned up." We, along I believe with EPA, used this term as if the contaminants would be removed, but as time went on the reality showed that the contamination of the site was worse than expected. For example the *Bainbridge Review* reported (December 10, 1997) that "Divers recently discovered pools of toxic pollutants between 20 and 40 feet wide floating on the floor of Eagle Harbor near the Superfund site." This discovery was recently described in the EPA video (https://www.youtube.com/watch?v=oz68qSUSsOA). Also 10 years ago EPA estimated 500,000 gallons of creosote remained underground; the updated estimate is now at 650,000 gallons. The wide extent of contamination and a feasability analysis sometimes resulted in deciding to cap contaminated areas. This in fact created the west beach and a clean cover layer of the Eagle Harbor bottom. Other areas at the site had acceptable levels of contamination and were in fact "clean." In the end the community is very appreciative to have a sandy west beach, a covered harbor bottom, forested uplands, and a site for the Japanese American Exclusion Memorial. There now remains the polluted Point and its surrounding shoreline. Fortunately this cleanup is facilitated based on now knowing the general locations of the contaminants.

CHOICE OF ALTERNATIVES

The seven alternatives for the upland cleanup are reviewed and rated by EPA in Reference 1. The final selection should involve weighing the following: 1) extent of cleanup, 2) environmental impact, 3) total cost, 4) time for completion, 5) effect on neighborhood, 6) risks, and 7) probability of success. A similar list of these criteria is outlined in Section 9 of Reference 1 – Comparative Analysis. ABC does not have the expertise to carry out a fair evaluation based on either of these two lists of criteria, but does have members who are qualified based on their professional background. One member who submitted comments is Janet Knox (See Reference 2) who is familiar with the site, and recommended Alternative 4. Another resident who also has a background in the field spoke in support at the public meeting for a version of digging up the soil, heating it to remove the contaminants, and returning the soil on site.

NEED FOR RISK ANALYSIS

As pointed out above ABC originally had a vision that the contamination which meets a "clean" threshold might be removed leaving a "clean" site; however the extent of the contamination and the cost and difficulty to clean it up was not feasible for some cases at the Superfund site. This resulted in leaving the contamination in place — but capped. It is ABC's understanding that this feasibility requirement to clean the Point and surrounding nearshore also will leave some of the contamination to remain at the site but immobilized. Thus we would like to recommend a risk analysis should be added to Section 6 and 9: "Risk - regarding the probability the chosen alternative would sustain some sort of failure, and what the consequences and repair would be." I have served on several boards of scientific societies which carried out risk analysis, albeit with different situations. Risk in Section 6 is defined as health and ecological risk which is of course important. However here I use Risk as it pertains to possible problems which could arise with each alternative. Potential problems should be listed along with an estimate of their probability of occurrence and ramifications. Examples would be if the aquitard were damaged due to a mistake in the depth of the auger, or somehow contaminated water flow entered into Puget Sound during land or nearshore digging. One possibility for a source of risk analysis, including probability, might be to cite similar sites with similar conditions and similar cleanup methods. Given limited data this could be a short analysis, but it would provide the community with EPA's confidence in the various alternatives – many of which probably have similar Risk analyses.

BASELINE

Perhaps the most-asked question ABC receives from Bainbridge residents is whether it is safe to go into the water at the sandy west beach. This beach has become a real destination, especially with the recent warm weather. ABC cites the CDC results and refers them to the July 2009 report by HHS/CDC:
http://www.atsdr.cdc.gov/HAC/pha/WyckoffWoodTreatingFacility/Wyckoff EagleHarborSuperfundSite 7-22-09.pdf

I am not sure if this document has been updated. If it hasn't ABC would recommend an updated report which would serve as a baseline before the cleanup of the Point is undertaken. Repeating the same measurement after all the operations have been completed would assure residents that the cleanup of the adjacent OU site had no effect on the safety of swimming at the West beach.

OTHER COMMENTS

Although there eventually will be many relatively minor details which accompany the chosen alternative, ABC would like to document its thoughts while there is an opportunity.

Noise. ABC recommended that a vibration device be used for the original installation of the sheet pile wall instead of a steam hammer for lower noise levels. This was appreciated by the neighbors, and any noise abatements for the chosen alternative will likewise be appreciated.

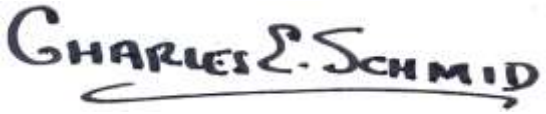
Traffic. The use of barges to transport equipment and materials has been brought up to minimize truck traffic.

Lowering of Sheet Pile Wall. The height of the sheet pile wall could be made lower from its present height, even taking sea level rise into account. Another option would be to slope the beach in front of the wall which will protect small fish which need shallow water to avoid predators. Any design which results in a more natural shoreline in appearance and function would be welcome.

Documentation of Cleanup. The 100 year history of the Creosote Plant has been documented with words and photographs. But there is a 30+ year history of the transition from a contaminated site to a park and national monument which needs to be documented with words and photos. This history would serve not only as a reminder that Superfund sites can be reclaimed, but also the high cost to restore sites could, and can be avoided by simple acts of prevention.

Roads. It appears all the alternatives will require re-routing of the entrance road down to the site from Eagle Harbor Drive and also provide public access to the water. ABC and members of the Pritchard Park Advisory Design Committee would appreciate being involved when the preliminary cleanup designs are drawn up. In addition shaping the terrain of the Point is important – but we realize this is a long way away – but then again the cleanup has come a long way in the three decades.

Thank you for considering ABC's comments, and we look forward to EPA's selection and implementation of one or a combination of the alternatives presented. Also ABC would like to compliment EPA on producing Reference 1 – the fold-out maps and photos were especially helpful in understanding the status of the site.



Secretary/Treasurer
cc: Dale Spoor, President

Corrections to Report

Item 4.2 says "City of Bainbridge Island, which purchased the property from EPA in 2002." Technically speaking I believe the City purchased the land from Pacific Sound Resources Company which was a trust with a trustee. Perhaps you might check with someone at EPA familiar with the Site. See http://www.bainbridgereview.com/news/19678454.html.

Acronyms and Abbreviations

Acronyms and Abbreviations

ARAR	applicable or relevant and appropriate requirement
ASIL	Acceptable Source Impact Level
ATSDR	Agency for Toxic Substances and Disease Registry
BACT	best available control technology
BAT	best available technology economically achievable
BCT	best conventional pollutant control technology
BMP	best management practice
BPJ	best professional judgment
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CH2M	CH2M HILL Engineers, Inc.
City	City of Bainbridge Island
COC	contaminant of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSL	Cleanup Screening Level
CWA	Clean Water Act
DAHP	Washington State Department of Archaeology and Historic Preservation
DNAPL	dense nonaqueous-phase liquid
DNR	Washington State Department of Natural Resources
DOH	Washington Department of Health
EBS	exposure barrier system
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	focused feasibility study
FS	feasibility study
GWTP	groundwater treatment plant
HDR	HDR Engineering, Inc.
HMR	Hazardous Materials Regulations
HMTA	Hazardous Materials Transportation Act
HQ	health quotient
IC	institutional control
LDR	Land Disposal Restriction
LNAPL	light nonaqueous-phase liquid
MNR	monitored natural recovery
MOU	memorandum of understanding
MTCA	Model Toxics Control Act
NAPL	nonaqueous-phase liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants

NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPV	net present value
NRHP	National Register of Historic Places
O&M	operation and maintenance
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon
PCP	pentachlorophenol
PQL	practical quantitation limit
PR	Pacific Sound Resources
Proposed Plan	*Proposed Plan for Amending the Records of Decision for the Wyckoff/Eagle Harbor Superfund Site (Operable Units 1, 2, and 4)*
PSCAA	Puget Sound Clean Air Agency
RAO	Remedial Action Objective
RBTC	risk-based threshold concentration
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	Remedial Investigation
ROD	Record of Decision
RODA	Record of Decision Amendment
SCO	Sediment Cleanup Objective
SEE	Science and Engineering for the Environment, LLC
SHPO	State Historic Preservation Officer
Site	Wyckoff/Eagle Harbor Superfund Site
SMP	Shoreline Master Program
SMS	State of Washington Sediment Management Standards
TEQ	toxicity equivalent
U.S.	United States
USACE	U.S. Army Corps of Engineers
UCL95	upper confidence limit on the mean
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WISAARD	Washington Information System for Architectural and Archaeological Records Data

Works Cited

Works Cited

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