Harris Avenue Shipyard

Cleanup Action Plan

Port of Bellingham
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Issued by

Washington State Department of Ecology
Toxics Cleanup Program
Southwest Regional Office
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Executive Summary

This document presents the Cleanup Action Plan (CAP) for the Harris Avenue Shipyard Site (Site) in Bellingham, Washington. This CAP was prepared by the Washington State Department of Ecology (Ecology) in collaboration with the Port of Bellingham (Port). This CAP has been prepared to meet the requirements of the Model Toxics Control Act administered by Ecology under Chapter 173-340 of the Washington Administrative Code. This CAP describes Ecology's proposed cleanup action for this Site, sets forth the requirements that the cleanup must meet, and was developed using information presented in the Remedial Investigation/Feasibility Study (RI/FS) for the Site, which was prepared for the Port by Floyd|Snider in 2019 (Floyd|Snider 2019a).

BACKGROUND

The Site, which represents the characterized extent of contaminated media, is located on property owned by the Port and the State of Washington. The state-owned lands are managed by the Washington State Department of Natural Resources (DNR). A Port Management Agreement with DNR executed in 1997 granted primary property management authority to the Port for multiple harbor-area parcels that are owned by the state and were previously managed by DNR. These parcels extend from the inner harbor line to the outer harbor line and include the in-water area operated most recently by Puglia Engineering (Puglia, operated as Fairhaven Shipyard). The upland portions of the Site were operated and managed most recently by Puglia as a tenant of the Port until early 2019 when Puglia vacated the Site. There are currently no ongoing operations at the Site, and the Port is marketing the property for new tenancy.

The Site consists of portions of the upland and aquatic lands that were used historically, and until recently, for industrial purposes, primarily as a shipyard. The Site's boundaries have been determined by investigations of soil, groundwater, and sediment quality throughout the areas of known historical operations. The Site is bordered on the north and west by Bellingham Bay (Bay) and on the south by Fairhaven Marine Park and BNSF Railway rail lines. Industrial properties owned by the Port are present to the east and southeast of the Site. The properties to the east of the Site and their current uses include the former Arrowac Fisheries, Inc. (Arrowac) property, a warehouse on the uplands, and the parking lot for the Arrowac property. Farther to the east is the Bellingham Cruise Terminal, operated by the Port as the southern terminus for the Alaska State ferry.

The Site is one of 12 cleanup sites located on and near the Bay coordinated under the Bellingham Bay Demonstration Pilot Project. The Site was identified as high priority by Ecology in 2000 in a comprehensive strategy developed in cooperation with the Bellingham Bay Action Team.

CLEANUP ACTION OVERVIEW

The cleanup action selected by Ecology for the Site is composed of multiple remedial technologies identified in the RI/FS to best address metals, total petroleum hydrocarbons, polycyclic aromatic hydrocarbon, and polychlorinated biphenyl contamination for the greatest degree of overall environmental benefit for the associated cost. The cleanup action also includes performance and

compliance monitoring. The RI/FS considered three different cleanup options for sediments and three different cleanup options for soil and groundwater. The proposed cleanup option from the RI/FS selected by Ecology as the preferred cleanup action for the Site includes the following:

- Dredging of sediment in accessible subtidal and intertidal areas (areas not located beneath structures or piers) to remove contaminated sediments resulting in compliance with Site cleanup levels (CULs)
- Capping of sediment in subtidal and intertidal areas that are located beneath structures or piers to contain sediments with contaminants at concentrations exceeding Site CULs
- Excavation of shallow soil (approximately 0 to 2 feet deep) with concentrations of contaminants that exceed Site CULs
- Limited excavation of deeper soil (approximately 4 to 8 feet deep) with concentrations of contaminants that exceed Site CULs
- Capping of deeper soil with concentrations of contaminants that exceed Site CULs
- Placement of institutional controls on the property to control potential future exposure to contaminants in excess of the CULs, while contaminants remain on the Site at concentrations greater than CULs

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List of Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
All American	All American Marine, Inc.
AO	Agreed Order
AOC	Area of Concern
ARAR	Applicable or Relevant and Appropriate Requirement
Arrowac	Arrowac Fisheries, Inc.
AST	Aboveground storage tank
Bay	Bellingham Bay
bgs	Below ground surface
BMP	Best management practice
CA	Cleanup Area
CAP	Cleanup Action Plan
COC	Contaminant of concern
cPAH	Carcinogenic polycyclic aromatic hydrocarbon
CPOC	Conditional point of compliance
CSM	Conceptual Site Model
CUL	Cleanup level
DNR	Washington State Department of Natural Resources

Acronym/ Abbreviation	Definition
Ecology	Washington State Department of Ecology
LPAH	Low molecular weight polycyclic aromatic hydrocarbons
MCI	Maritime Contractors, Inc.
MTCA	Model Toxics Control Act
OMMP	Operations, Management, and Monitoring Plan
PAF	Pacific American Fisheries Company
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
POC	Point of compliance
Port	Port of Bellingham
RAL	Remedial Action Level
RI/FS	Remedial Investigation/Feasibility Study
SEPA	State Environmental Policy Act
Site	Harris Avenue Shipyard Site
SMS	Sediment Management Standards
SMU	Sediment Management Unit
SSI	Supplemental Site Investigation
SVOC	Semivolatile organic compound
SWAC	Surface-weighted average concentration
TPH	Total petroleum hydrocarbons
UST	Underground storage tank

1.0 Introduction

1.1 PURPOSE

This document is the Cleanup Action Plan (CAP) for the Harris Avenue Shipyard Site (Site) located in Bellingham, Washington. The location of the Site is shown in Figure 1.1. A CAP is required as part of the Site cleanup process under the Model Toxics Control Act (MTCA), RCW 70.105D and WAC 173-340, administered by the Washington State Department of Ecology (Ecology). The cleanup action decision is based on the Remedial Investigation/Feasibility Study (RI/FS) and other relevant documents in the administrative record. The purpose of the CAP is to identify, and generally describe, the proposed cleanup action for the Site and to provide an explanatory document for public review. More specifically, this plan:

- Describes the Site;
- Summarizes current Site conditions;
- Summarizes the cleanup action alternatives considered in the remedy selection process;
- Describes the selected cleanup action for the Site and the rationale for selecting this alternative;
- Identifies Site-specific cleanup levels (CULs) and points of compliance (POCs) for the contaminants of concern (COCs) and impacted media for the proposed cleanup action;
- Identifies Site-specific remedial action levels (RALs) that will be used during remedy implementation;
- Identifies applicable state, federal, and local laws for the proposed cleanup action;
- Identifies the expected residual contamination remaining on the Site after implementation of the cleanup and restrictions on future uses and activities at the Site to ensure continued protection of human health and the environment;
- Discusses compliance monitoring requirements; and
- Presents the schedule for implementing the CAP.

Ecology has made a preliminary determination that a cleanup conducted in conformance with this CAP will comply with the requirements for selection of a remedy under WAC 173-340-360.

1.2 SITE OWNERSHIP AND SETTING

The Site (Figure 1.2) is owned by the Port of Bellingham (Port) and the State of Washington with state-owned lands managed by the Washington State Department of Natural Resources (DNR). A Port Management Agreement with DNR executed in 1997 granted primary property management authority to the Port for multiple harbor-area parcels that are owned by the state and were previously managed by DNR. These parcels extend from the inner harbor line to the

outer harbor line and include the in-water area operated most recently by Puglia Engineering (Puglia, operated as Fairhaven Shipyard). The upland portions of the Site were also operated and managed most recently by Puglia as a tenant of the Port until early 2019 when Puglia vacated the Site. There are currently no ongoing operations at the Site, and the Port is marketing the property for new tenancy.

The Site consists of portions of the upland and aquatic lands that were used historically and until recently for industrial purposes, primarily as a shipyard. The Site's boundaries, which define the extent of identified contamination, have been determined by investigations of soil, groundwater, and sediment quality within the study area. The Site is bordered on the north and west by Bellingham Bay (Bay) and on the south by Fairhaven Marine Park and the BNSF Railway rail lines. Industrial properties owned by the Port are present to the east and southeast of the Site. Properties to the east of the Site and their current uses include the former Arrowac Fisheries, Inc. (Arrowac) property, a warehouse on the uplands, and the parking lot for the Arrowac property. Farther to the east is the Bellingham Cruise Terminal, operated by the Port as the southern terminus for the Alaska State ferry.

The Site is one of 12 cleanup sites located on and near the Bay coordinated under the Bellingham Bay Demonstration Pilot Project. The Site was identified as high priority by Ecology in 2000 in a comprehensive strategy developed in cooperation with the Bellingham Bay Action Team.

1.3 PREVIOUS STUDIES

This section summarizes environmental investigations and actions that have been completed to date at the Site or adjacent to the shipyard. Upland and sediment investigations have been conducted at the shipyard since approximately 1993 and have been documented in several reports prepared by Ecology, GeoEngineers, RETEC, and Floyd|Snider. Those investigations include the following:

- Pre-1998: Site investigations and Ecology inspections identified metals, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons (TPH) in upland soil and sediment.
- 1998: Phase 2 sampling in sediments was performed by RETEC for metals, PCBs, SVOCs, and organotins.
- 1998: RETEC performed Phase 2 sampling in upland soil and groundwater. Soil sampling confirmed that elevated metals, TPH, and polycyclic aromatic hydrocarbons (PAHs) were present in subsurface soil. Groundwater sampling confirmed that elevated dissolved metals and TPH were present.
- 2000 and 2003: RETEC conducted a variety of bioassay sediment toxicity tests. In the initial 2000 sampling, there were quality control issues and toxicity failures for some samples. In the subsequent 2003 sampling, further quality control issues were attributable to additional failures. However, a second round of sediment collection and additional bioassay testing was performed, and all bioassay testing locations passed Sediment Management Standards (SMS) biological effects criteria.

- 2004 to 2006: The RETEC working draft Sediments RI/FS (RETEC 2004) was completed for Ecology review in May 2004 and amended in January 2006 (RETEC 2006) to include the findings of a supplemental sediment source control evaluation conducted in 2005. Additional sampling consisting of sediment cores and bioassay testing were performed.

  Additional core samples were collected in February 2004 to characterize sediment suitability for disposal at an open water disposal site. This program was completed in accordance with the Puget Sound Dredged Disposal Analysis program and the Dredged Material Management Program.

- 2005: RETEC performed an upland source control sampling investigation that consisted of soil, groundwater, and sediment sampling. The results of the investigation were incorporated into the RETEC working draft Sediments RI/FS that was completed for Ecology review in 2006.

- 2011: Floyd|Snider conducted a Supplemental Site Investigation (SSI) to gather additional data to further characterize upland site conditions, address the upland and sediment data gaps, and better define the preliminary site-wide Conceptual Site Model (CSM). The SSI upland investigation included soil and groundwater sample collection and analysis, and the installation of additional groundwater monitoring wells. To address data gaps in marine sediments, bank/intertidal and nearshore surface sediment samples were collected to evaluate potential upland and shoreline transport pathways to sediments, as well as to evaluate source control.

- 2013: Floyd|Snider conducted a data gaps investigation to fill data gaps identified as part of the SSI work and collect upland and in-water data to further define the nature and extent of known COCs for completion of the RI/FS. The scope of work primarily included upland sampling for petroleum hydrocarbon contamination associated with the former underground storage tank (UST) area and to assess the potential for contaminant mobility in the shoreline area and northeast corner of the study area. Nearshore and intertidal sediment sampling was completed to further define extent of contamination in the shoreline area and assess potential contaminant migration from the upland area.

- 2015: Floyd|Snider conducted a pre-interim action investigation in February 2015 to collect additional soil, groundwater, and sediment chemistry and physical data to enable design of an Interim Action in the uplands and in the sediments. In the uplands, the locations and sampling depths were used to provide a comprehensive set of data in order to define the lateral and vertical extent of the excavation completed during the Interim Action activities. In the sediments, samples were located throughout the proposed Interim Action area to delineate the final depths of contamination within the Interim Action area.

- 2016: Following implementation of the Interim Action in the uplands and sediments, confirmation samples were collected to verify the Interim Action was complete. Sample results were reported in the Interim Action Construction Completion Report that was finalized in March 2019 (Floyd|Snider 2019a).

For additional detail on these investigations and actions, please refer to Section 2.5 in the RI/FS (Floyd|Snider 2019b).

1.4 REGULATORY FRAMEWORK

The Site is undergoing investigation and cleanup by the Port with Ecology oversight in accordance with Agreed Order (AO) No. 7342 (as amended), between Ecology and the Port. The AO required preparation of an RI/FS and CAP, pursuant to the requirements of MTCA. See RCW 70.105D.050(1). The Port completed its RI/FS, and Ecology approved the Final RI/FS Report in spring 2019. This CAP is being prepared to fulfill the remaining scope requirements of the current AO (as amended).

1.4.1 MTCA Requirements

The MTCA Cleanup Regulation sets forth the minimum requirements and procedures for selecting a cleanup action. These requirements are specified in WAC 173-340-360 as follows.

WAC 173-340-360(2) states that cleanup action must meet each of its minimum requirements, including certain threshold and other requirements. WAC 173-340-360(2)(a) requires the cleanup action to meet the following threshold requirements:

- Protect human health and the environment;
- Comply with cleanup standards (see Sections 2.3 and 3.3);
- Comply with applicable state and federal laws (see Section 3.4); and
- Provide for compliance monitoring.

In addition, WAC 173-340-360(2)(b) states the cleanup action shall meet these other requirements:

- Use permanent solutions to the maximum extent practicable;
- Provide for a reasonable restoration time frame; and
- Consider public concerns.

WAC 173-340-360(3) describes the specific requirements and procedures for determining whether a cleanup action uses permanent solutions to the maximum extent practicable. A permanent solution is defined as one where CULs can be met without further action being required at the Site other than the disposal of residue from the treatment of hazardous substances. To determine whether a cleanup action uses permanent solutions to the maximum extent practicable, a disproportionate cost analysis is conducted. This analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors, including:

- Protectiveness;
- Permanent reduction of toxicity, mobility and volume;

- Cost;
- Long-term effectiveness;
- Short-term risk;
- Implementability; and
- Consideration of public concerns.

The comparison of benefits and costs may be quantitative but will often be qualitative and require the use of best professional judgment.

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame.

1.4.2 Other Regulatory Requirements

In addition to complying with the requirements set forth in the AO, the Port is required to comply with applicable federal, state, and local laws and regulations. Because work at the Site is being conducted under an order with Ecology, the Port is exempt from procedural requirements of certain Washington state laws and regulations and all local permits (WAC 173-340-710(9)(b)). However, implementation of the cleanup action must comply with the substantive requirements of any otherwise applicable permits. Ecology shall provide an opportunity for comment by the public and by the state agencies and local governments that would otherwise implement these laws (WAC 173-340-710(9)(d)).

Remedial action work conducted in the Bay will require authorization from the U.S. Army Corps of Engineers. The cleanup action will be reviewed and approved by all appropriate federal jurisdictions and tribes.

The State Environmental Policy Act (SEPA) process for review and analysis of potential environmental impacts resulting from the cleanup action will be conducted by the Port and Ecology prior to project construction. Refer to Section 3.4 for a list of all Applicable or Relevant and Appropriate Requirements (ARARs), including substantive requirements for procedurally exempt local and state laws and regulations.

2.0 Site Description

2.1 SITE HISTORY

People of the Lummi Nation and Nooksack Tribe historically occupied this area with populations concentrated at the mouth of the Nooksack River, along Whatcom Creek, and on the San Juan Islands since time immemorial.

The Site itself has been used by various entities for industrial purposes since the early 1900s. Prior to industrial use and development, a 60-foot-tall bluff called Deadman's Bluff (also known as Grave Yard Point, Poe's Point, and Deadman's Point) existed near the Fairhaven waterfront. In 1899, this bluff was hydraulically regraded into the Bay to create Commercial Point (HRA 2011). The Site was first developed in 1915 when Pacific American Fisheries Company (PAF) constructed the Commercial Point Shipyard. The following bullets summarize the subsequent historical uses of the Site (see RI/FS for more detail):

- 1915: PAF constructed a shipyard and built oceangoing wooden steamships, including vessels for the U.S. Shipping Board in support of the war effort in World War I.
- 1920: PAF dismantled shipbuilding facilities.
- 1937: PAF dredged and backfilled the area around Commercial Point to expand the boatyard property (Jewell 2008).
- Late 1930s to 1940s: Historical records indicate shipway structures were constructed sometime in the 1940s. A Union Oil-labeled aboveground storage tank (AST) for ship fuel was located near the main dock (Figure 1.2). The AST was removed in the late 1940s or early 1950s.
- 1942 to 1945: Commercial Point Shipyard was used for the construction of U.S. Army tugboats and freighter passenger vessels by Northwestern Shipbuilding Company, a Seattle firm that leased the shipyard from PAF (Jewell 2008).
- 1966: The Port purchased the PAF property, including the shipyard.
- 1968: Post Point Marine leased the property; the company changed its name to Post Point Industries in June 1970.
- 1971: Associated Venture Capital purchased Post Point Industries and changed its company name to Fairhaven Shipyard.
- 1971: Weldit Corporation purchased Fairhaven Shipyard and changed its company name to Fairhaven Industries, Inc.
- 1982: The Port purchased Dry Dock No. 1 and dredged approximately 25,000 cubic yards of sediment to accommodate the structure.
- 1985: Maritime Contractors, Inc. (MCI) acquired the existing Weldit (Fairhaven Industries, Inc.) lease. MCI established a new lease agreement with the Port in 1986. MCI also added a smaller dry dock (Dry Dock No. 2) along the main pier.

- 1991: MCI removed a UST with a 3,000-gallon gasoline compartment and a 10,000-gallon diesel compartment.
- 1996: A concrete extension was built at the north end of the Main Pier.
- 1998: MCI terminated operations and sold the company's assets to Bellingham Bay Shipyards, which initiated a new lease agreement with the Port.
- 2002: Puglia and All American Marine, Inc. (All American) entered into separate leases with the Port and conducted separate operations at the shipyard. Dry Dock No. 2 was removed from the shipyard.
- 2004: Puglia reconfigured stormwater drainage at the shipyard so that stormwater falling within the shipyard's primary industrial areas (i.e., asphalt and concrete near the painting booths and the marine railway) would be collected and treated prior to discharge to the City's publicly owned treatment works.
- 2005: Puglia began operating as Fairhaven Shipyard.
- 2009: Puglia acquired, permitted, and began operating the submersible barge, named the Faithful Servant, at the northeast end of the Main Pier.
- 2017: All American vacated the property; Puglia vacated the Carpenter Building and moved into the leasehold previously occupied by All American.
- 2019: Puglia vacated the Site, leaving no ongoing operations. The Faithful Servant and Dry Dock No. 1 were sold and removed from the Site.

2.2 HUMAN HEALTH AND ENVIRONMENTAL CONCERNS

Multiple exposure pathways have been evaluated at the Site and were addressed in the development of the Site screening levels and evaluation of Site conditions in the RI/FS. Figure 2.1 presents a graphical representation of the current CSM. The exposure pathways shown in the CSM are described further in Section 2.3.

The main sources of contamination at the Site are associated with historical shipyard activities. The property has been used as a shipyard on and off since 1915, with multiple owners and operators throughout this time performing vessel storage, construction, maintenance, and repair operations.

The primary sources of sediment contamination (consisting of metals [arsenic, cadmium, copper, zinc], carcinogenic PAHs [cPAHs], high molecular weight PAHs [fluoranthene, pyrene], and PCBs) include the following pathways:

- Overwater and nearshore operations that resulted in spills, leaks, and releases of hazardous materials directly to Site waters and surface sediments.
- Impacted groundwater originating from upland areas, traveling through the fill unit (soil) and then discharging to sediments.

- Discharges of contaminated materials to sediments from former industrial wastewater or stormwater outfalls.
- Discharges by sheet flow of surface contamination generated from upland activities (e.g., sandblasting).
- Erosion and sloughing of contaminated nearshore fill materials onto the intertidal sediment surface (e.g., marine railway area).

Primary sources of soil and groundwater contamination (consisting of metals [arsenic, copper, zinc], TPH, and low molecular weight PAHs [LPAHs; 1-methylnaphthalene]) in the uplands include:

- Operations conducted in the marine railway area. This was one of the most heavily used areas of the shipyard and the location where the most extensive contamination has been identified, including contaminants associated with painting and sandblasting.
- Releases of petroleum products (consisting of hydrocarbons and LPAHs) from the former AST systems located south of the Harris Avenue Pier.
- Shipyard operations including painting, sandblasting, handling sandblast grit, and ship repair activities throughout the primary shipyard property.

2.3 CLEANUP STANDARDS

This section discusses the cleanup standards in affected media that have been established for the Site. Cleanup standards consist of: (1) CULs defined by regulatory criteria that are protective of human health and the environment; and (2) pathway-specific POCs that designate locations at the Site where the CULs must be met.

2.3.1 Sediment

2.3.1.1 Applicable Pathways and Cleanup Levels

The following pathways were considered for the establishment of sediment CULs at the Site:

- Protection of benthic species in Site sediments.
- Protection of human health via direct contact by site workers and incidental ingestion of intertidal sediment.
- Protection of human health via direct contact during net fishing and incidental ingestion of subtidal sediment.
- Protection of humans and higher trophic level species via the consumption of seafood.

The following table summarizes the COCs in sediment and their applicable CULs.

Contaminant of Concern	Protection of Benthic Species and Human Direct Contact		Protection of Seafood Consumption by Humans or Wildlife (mg/kg)
	Intertidal Area (mg/kg)	Subtidal Area (mg/kg)	
Arsenic	20	13	13
Cadmium	--	--	0.8
Copper	390	390	--
Zinc	410	410	--
Total PCBs	--	0.13	0.033
cPAH TEQ	--	--	0.14
Fluoranthene	--	1.7	--
Pyrene	--	2.6	--

Note:
-- Not applicable.

Abbreviations:
mg/kg Milligrams per kilogram
TEQ Toxic equivalent

2.3.1.2 Points of Compliance

The following table summarizes the POCs for sediment as they relate to each separate exposure pathway.

Exposure Pathway	Point of Compliance
Protection of benthic species.	Upper 12 cm throughout Site sediments, evaluated on a point-by-point basis.
Protection of human health via direct contact by site workers and incidental ingestion of intertidal sediment.	Upper 12 cm in the Site intertidal sediment area (defined as above 0 feet MLLW and beyond the toe of the bank), evaluated on a SWAC basis. (1)
Protection of human health via direct contact during net fishing and incidental ingestion of subtidal sediment.	Upper 12 cm throughout the subtidal zone (defined as sediments below 0 feet MLLW), evaluated on a SWAC basis. (1)
Protection of humans and higher trophic level species via the consumption of seafood.	Upper 12 cm throughout Site sediments, evaluated on a SWAC basis. (1)

Note:
1 Per SCUM II, bioaccumulative exposures occur on an area-wide basis; therefore, sediment concentrations were averaged on an area-weighted basis (i.e., SWAC) for comparison to the natural background or regional background concentration.

Abbreviations:
cm Centimeters
MLLW Mean Lower Low Water
SCUM II Sediment Cleanup User's Manual II
SWAC Surface-weighted average concentration

2.3.1.3 Pre-Design Remedial Action Levels

Pre-Design RALs were developed in the RI/FS and are the concentrations of each COC in sediment that need to be addressed so that the average sediment concentration at the Site complies with the CUL following completion of the remedy, based on the current dataset. RALs developed in the RI/FS for the SWAC-based sediment COCs (arsenic, cadmium, cPAHs, and PCBs) are summarized in the following table.

Contaminant of Concern	Remedial Action Level (mg/kg)	Rationale for RAL
Arsenic	20	The RAL is protective of benthic species and direct human contact in the intertidal beach areas.
Cadmium	5.1	The RAL is based on the benthic SMS SCO of 5.1 mg/kg.
cPAH TEQ	4.2	The RAL is based on direct contact via the net fishing scenario at 10^{-6} risk.
Total PCBs	0.13	The RAL is based on the benthic SCO of 0.13 mg/kg.

Abbreviation:
SCO Sediment cleanup objective

Following collection and analysis of the pre-remedial design investigation data and completion of the constructability analyses for the selected remedy, the RALs for the project may be modified from the values developed in the RI/FS. Any modification of the RALs will be approved by Ecology and must continue to result in SWAC-based compliance with CULs following remedy implementation.

2.3.2 Groundwater

2.3.2.1 Applicable Pathways and Cleanup Levels

The following pathways were considered for the establishment of groundwater CULs at the Site:

- Groundwater to surface water - protection of surface water quality
- Groundwater to sediment - protection of sediment quality

The following table summarizes the COCs in groundwater and their applicable CULs, selected as the lowest of the applicable CULs for the pathways listed above.

Contaminant of Concern (1)	Cleanup Level (µg/L)	Cleanup Level Basis
Arsenic	5.0	MTCA Method A, as modified by natural background
Copper	3.1	Protection of surface water quality
Zinc	81	Protection of surface water quality
1-Methylnaphthalene	1.5	MTCA Method B

Note:
1 For metals, compliance with the proposed CULs is assessed using filtered groundwater samples; in surface water, the criteria are applicable to dissolved metals in the water column.

Abbreviation:
µg/L Micrograms per liter

2.3.2.2 Points of Compliance

MTCA states that the standard POC for groundwater CULs is throughout the Site to the outer boundary of the contaminant plume. However, Ecology may approve a conditional POC (CPOC) where it can be demonstrated that it is not practical to meet the CUL throughout the Site within a reasonable restoration timeframe. The CPOC must be located as close as possible to the source but cannot exceed the property boundary (WAC 173-340-720(8)(c).[1]

Given that Ecology has determined that the groundwater in the vicinity of the Site is not potable and that the highest beneficial use of groundwater at the Site is discharge to surface water and sediment, a groundwater CPOC is appropriate for the Site where groundwater discharges into surface water through the sediments. The following table summarizes the CPOCs as they relate to each separate exposure pathway.

Exposure Pathway	Conditional Point of Compliance
Protection of surface water quality	Where groundwater discharges to surface water
Protection of sediment quality	Where groundwater discharges to sediments

2.3.3 Soil

2.3.3.1 Applicable Pathways and Cleanup Levels

The following pathways were considered for the establishment of soil CULs at the Site:

- Protection of human direct contact
- Protection of groundwater quality: unsaturated zone

[1] The upland portion of the Site includes both the Port-owned parcel and the state-owned land managed by DNR waterward of the Inner Harbor Line (Figure 1.2).

- Protection of groundwater quality: saturated zone
- Prevention of vapor intrusion

The following table summarizes COCs in soil and their applicable CULs.

Contaminant of Concern	Cleanup Level and Applicable Pathways		AOC Where CUL Applies
	Shallow Soil (0–15 ft bgs): Protection of Human Direct Contact (mg/kg) (1)	Protection of Groundwater (mg/kg)	
Arsenic	88	88	AOC 2A, AOC 2B, and AOC 3 (all AOCs)
Copper	--	390	AOC 2B
Zinc	--	960	AOC 2B
Total TPH	--	8,000 (2)	AOC 3
		24,000 (3)	AOC 2A and AOC 2B

Notes:
1 The CUL is based on an industrial worker exposure scenario.
2 This CUL is applicable to AOC 3, where diesel concentrations in soil exceeding 8,000 mg/kg leaching into groundwater can cause anerobic conditions that lead to the leaching of arsenic at unacceptable levels.
3 This CUL is applicable to the area outside of AOC 3. Concentrations less than this CUL are protective of all pathways and are not contributing to arsenic leaching at unacceptable levels.

Abbreviations:
AOC Area of Concern
bgs Below ground surface

2.3.3.2 Points of Compliance

The following table summarizes the soil POCs as they relate to each separate exposure pathway.

Exposure Pathway	Point of Compliance
Protection of human direct contact	Upper 15 feet throughout the Site
Protection of groundwater quality: unsaturated zone	Unsaturated zone soils (top 8 feet throughout the Site), based on infiltrating stormwater
Protection of groundwater quality: saturated zone	Saturated zone soils (soil below 8 feet bgs), based on groundwater migration
Prevention of vapor intrusion	Unsaturated zone soils to protect indoor air in slab-on-grade structures containing office spaces that are within the lateral inclusion zone (30 feet of soil TPH impacts) (1)

Note:
1 Prior to any future Site development involving occupied structures, soil vapor risk will be evaluated in consultation with Ecology using the most current and appropriate soil vapor guidance documents. Mitigation measures, if determined necessary, will be installed for prevention of vapor intrusion.

3.0 Description of Selected Remedy

3.1 CLEANUP AREAS

The Site is described in Section 1.2, and this CAP describes cleanup actions to be implemented throughout the Site. These cleanup actions will be applied to sediments and the uplands to address AOCs where contamination exceeds applicable CULs.

Because the remedial technologies to be used vary depending on the conditions present in different locations of the Site, the RI/FS subdivided the Site into geographical areas with similar physical and/or chemical conditions. Contaminated sediments at the Site are all within one AOC that was further subdivided into several discrete Sediment Management Units (SMUs). Contaminated soil and groundwater in the uplands were divided into two AOCs. For purposes of remedy implementation, the SMUs and upland AOCs developed in the RI/FS have been reorganized into areas with common contaminant and physical conditions that warrant similar cleanup actions. This CAP refers to these areas as SMUs and Cleanup Areas (CAs).[2] These areas are shown in Figure 3.1 and described in the following sections.

3.1.1 Sediment Management Units

The contaminated sediment area of the Site is divided into four SMUs as shown on Figure 3.1, consisting of the following:

- SMU 1: accessible subtidal areas
- SMU 2: accessible intertidal areas
- SMU 3a: subtidal area located beneath the Harris Avenue Pier segment that was not removed and replaced as part of the 2018 Interim Action work
- SMU 3b: intertidal and subtidal area located beneath the western-most dock structure
- SMU 4a: subtidal portion of the marine railway infrastructure
- SMU 4b: intertidal portion of the marine railway infrastructure

3.1.2 Upland Cleanup Areas

The upland area of the Site is divided into three upland CAs as shown on Figure 3.1, consisting of the following:

- CA 1: shallow unsaturated soil (approximately 0 to 4 feet bgs) throughout the upland portion of the Site, wherever elevated metals contamination is present
- CA 2: deeper unsaturated soil (approximately 4 to 8 feet bgs) in the northwest area of the uplands where elevated metals contamination is present at greater depths than the rest of the Site

[2] SMU and CA numbering in the CAP does not match SMU numbering in the RI/FS.

- CA 3: unsaturated and saturated soil in the northeast corner of the upland area, where TPH contamination was present (this area was remediated as part of the 2018 Interim Action as described in Section 3.2.1)

3.2 DESCRIPTION OF THE CLEANUP ACTIONS

The remedy selected by Ecology for implementation at the Site is consistent with the preferred remedial alternative proposed in the RI/FS. This section describes the selected remedy and provides the rationale for why it was selected.

3.2.1 Interim Action

The selected remedy for the Site includes work that was conducted by the Port in an Interim Action that took place in 2017 and 2018 (Figure 3.1). During preparation of the draft RI/FS in 2014, the Port conducted a structural assessment of the wooden portion of the Harris Avenue Pier, including the overwater Carpenter Building and its supporting pier, the East Marine Walkway, which is part of the Harris Avenue Pier, and the West Marine Walkway. The structural assessment found these structures to be in a dilapidated and potentially dangerous condition. Their removal provided an opportunity to gain access to largely inaccessible contaminated sediments and implement a permanent cleanup remedy (dredging, rather than capping) in these areas as part of an interim action in the sediments and uplands.

3.2.1.1 Sediments

The sediment component of the Interim Action was completed in 2018. In-water and overwater work included the following components:

- Demolition and removal of the wooden portion of the Harris Avenue Pier and the Carpenter Building and its supporting pier (including the East Marine Walkway).
- Dredging to CULs or remediation goals identified in the Interim Action Work Plan (Floyd|Snider 2015) in subtidal sediment at and near the Harris Avenue Pier.
- Removal of contaminated intertidal sediments at and near the Harris Avenue Pier to approximately 3 feet below the mudline and capping of the intertidal areas with clean fill to match existing grades.
- Construction of a sheet pile bulkhead and a new concrete pier in the location of the existing wooden portion of the Harris Avenue Pier to restore existing functions and maintain site operations.
- Reconstructing the East Marine Walkway on the east side of the marine railway to restore prior functions.

3.2.1.2 Uplands

The upland portion of the Interim Action was completed in 2017 and was performed in the area where utility installation and modifications were required to provide service to the replacement Harris Avenue Pier.

The following actions were taken in the upland remediation area:

- Excavation and removal of contaminated soil exceeding Interim Action confirmation criteria within the upland cleanup area ranging from 2 to 8 feet bgs.
- Installation of new utilities and modification of existing utilities to provide service to the replacement pier.
- Backfilling with clean fill and placement of a gravel surface to restore the construction area to existing conditions.

3.2.2 Planned Sediment Cleanup Actions

Three sediment remedial alternatives were evaluated in the RI/FS: (1) a full capping alternative; (2) a combination dredging and capping alternative; and (3) a full removal alternative. The selected cleanup action, Alternative 2, was shown to provide the greatest degree of benefit for the associated cost of the three alternatives discussed in the RI/FS. The cleanup action for sediments is a comprehensive final remedy for the active sediment remediation area of the Site that will comply with all applicable remedy selection requirements under MTCA and SMS.

The cleanup action to remediate Site sediments will include a combination of dredging and capping technologies based on chemical concentrations, site operational considerations, accessibility, and existing infrastructure:

- **Dredging:** Accessible open water areas of the Site within the active remediation area (SMU 1) will be dredged to achieve CULs/RALs. A portion of SMU 1 dredging was completed during the Interim Action in 2018. Dredging will remove the sediment to an average depth of 2 to 4 feet below the mudline. The West Marine Walkway will be demolished to facilitate dredging and, if later required, rebuilt for operational use of the marine railway after sediment remediation is complete. Dredged material will be removed from the aquatic environment for upland landfill disposal or, if appropriate, upland beneficial reuse.
- **Excavation and Backfill:** Open intertidal areas (SMU 2) will be excavated to an average depth of 3 feet and then backfilled to maintain existing elevations. A portion of SMU 2 excavation was completed during the Interim Action in 2018. Excavated material will be removed from the aquatic environment for upland landfill disposal, or upland beneficial reuse, if appropriate.
- **Under-Pier Granular Cap:** The Harris Avenue Pier (SMU 3a), west dock (SMU 3b), and marine railway (SMU 4a and 4b) structures (Figure 3.1) will be retained for future business operations. An average of 1 to 3 feet of granular capping material will be placed beneath these structures to contain sediment contamination in place. Prior to capping, an average of 3 feet of sediment will be removed from beneath the intertidal section of the marine railway (SMU 4b) by targeted excavation before applying the granular cap material beneath this structure up to the top of the railway girders. Excavated material will be removed from the aquatic environment for upland landfill disposal or, if appropriate, upland beneficial reuse.

- **Compliance Monitoring:** Compliance monitoring includes both performance and confirmation monitoring. The selected cleanup includes long-term monitoring of the intertidal excavation backfill to ensure stability and effectiveness of the constructed granular caps. Long-term monitoring will continue as long as contamination remains contained on the Site in excess of cleanup standards.
- **Institutional Controls:** The implementation of institutional controls in the form of requirements to maintain the capped areas and manage exposure to contaminated sediments that were capped will include the following:
  - Worker health and safety requirements during future redevelopment work in the intertidal area, such as bulkhead wall replacement.
  - Limits on overwater operations that may disturb the physical integrity of sediment caps, such as propeller wake restrictions, if deemed necessary through propeller wash analyses.
  - Restrictions on digging or other activities that may disturb capped areas and expose contained sediments.
  - Evaluation of more permanent remedial actions at the time the pier or marine railway structures are renovated, replaced, or demolished.

Together, these individual technologies will manage the exposure pathways to all contamination in Site sediments.

3.2.2.1 Compliance with MTCA Requirements

The selected cleanup actions for sediments were evaluated in detail in the RI/FS for compliance with MTCA requirements. The selected cleanup alternatives for the in-water areas at the Site have been identified as the actions that provide the greatest degree of benefit for the associated cost. Cleanup actions are required to, at a minimum, comply with cleanup standards, comply with ARARs, and provide for a reasonable restoration timeframe. An analysis of how these minimum requirements are met by the CAP is provided in Sections 3.3 through 3.5.

The following bullets summarize the evaluation conducted in the RI/FS for sediments (uplands are discussed in Section 3.2.3) and describe why the selected cleanup action for sediments was identified as the action that was permanent to the maximum extent practicable using a disproportionate cost analysis.

- **Overall Protectiveness:** There will be an improvement in overall environmental quality resulting from implementation of the selected cleanup action through a combination of contaminated sediment removal and capping, as well as monitoring and implementation of institutional controls. Contaminated sediment removal reduces existing risks by removing contaminant mass from most of the contaminated in-water area. Capping beneath structures combined with long-term monitoring extends the protections against potential exposures to the remainder of the contaminated sediment. Institutional controls ensure that caps remain stable and effective throughout their lifespan.

- **Permanence:** The selected cleanup action provides a significant reduction in contaminant toxicity and volume. There is a reduction in contaminant volume through removal of contaminated sediment across most of the in-water Site area. Toxicity to human and ecological receptors is reduced through capping by interrupting the pathways for exposure to the contamination remaining on the Site. Caps will only be placed beneath structures where they are least susceptible to erosional damage, particularly from propeller wash.
- **Effectiveness over the Long-Term:** The cleanup action provides certainty of success through removal of contaminants from all the open water areas of the Site through dredging and excavation. Sediments beneath overwater structures will be capped in place, which will require long-term monitoring and management through institutional controls. The presence of the overwater structures will limit the extent of capping to a small proportion of the Site and to locations where they are best protected from erosional forces such as propeller wash. All these technologies are commonly applied at contaminated sediment sites and known to achieve cleanup goals.
- **Short-Term Risk Management:** During construction, short-term risk is associated with potential release and transport of contaminated sediment in the water, as well as potential exposures to workers and the public as contaminated sediment is removed from the water for upland landfill disposal or possible beneficial reuse. Potential risks of in-water release will be managed through best management practices (BMPs) such as a turbidity curtain surrounding the work area and use of an environmental dredge bucket to minimize sediment release from the point of dredging. Risks of release during transport will be minimized through the utilization of professional boat captains and other licensed professional equipment operators and truck drivers with appropriate training for handling contaminated materials. Risks to remedial construction workers will be managed through a Site-specific Health and Safety Plan, which will consider engineering controls and the use of appropriate personal protective equipment to minimize potential exposure. Together, these controls are highly effective and anticipated to adequately manage short-term risk.
- **Technical and Administrative Implementability:** This cleanup action has a high degree of implementability. It is technologically feasible, includes a reasonable and achievable scope, and avoids negative impacts to site operations by retaining structures or maintaining berth depths. All necessary offsite facilities, materials, and services are available within the region and are accessible. This cleanup action complies with all applicable administrative and regulatory requirements and will be managed and constructed by specialty professionals familiar with the type of work. Site access for construction and long-term monitoring is available, because the Port and the State of Washington are the landowner and the Port is the party conducting the cleanup. Implementation of this alternative may be phased to minimize impacts to site operations and will be coordinated with any Site tenant at the time of construction. The cleanup action can be integrated with both existing and proposed future Site uses.

- **Consideration of Public Concerns:** The RI/FS went through a public review process before finalization. In addition, a review of similar projects during preparation of the RI/FS suggested that the selected cleanup action will address many common concerns raised by the public in regard to this type of remediation project. This CAP will be subject to public review and comment, and Ecology will consider public comments and concerns during finalization of the CAP.

3.2.2.2 Additional Cleanup Action Considerations

The cleanup action supports ongoing use of the Site by leaving all existing over- and in-water structures in place. Granular cap material placed beneath these structures is protective of the direct contact exposure pathways. The removal of contaminant mass through dredging and the excavation of open in-water areas of the Site, combined with capping of sediments beneath structures, is protective of the benthic organism exposure and human/higher trophic level animal seafood consumption exposure pathways. These caps will be maintained, in accordance with Site institutional controls, as long as contaminated sediment exceeding CULs remains contained on the Site beneath caps.

3.2.3 Planned Upland Cleanup Actions

Three upland remedial alternatives were evaluated in the RI/FS: (1) a minimum soil removal alternative; (2) an alternative using a combination of soil removal and capping; and (3) a full removal alternative. The selected cleanup action, Alternative 2, was shown to provide the greatest degree of benefit for the associated cost of the three alternatives discussed in the RI/FS. The cleanup action for soil and groundwater is a comprehensive final remedy for the upland portion of the Site that will comply with all applicable remedy selection requirements under MTCA.

The cleanup action for the uplands will remediate soil and groundwater at the Site using the following technologies:

- **Shallow Soil Source Removal and Capping:** One of the following remedial actions will be implemented in CA 1 where COC concentrations in shallow soil exceed CULs:
  - Removal of the top 2 feet of contaminated soil to support gravel cap placement. Excavated soil would be disposed of off-site at a licensed and permitted facility. A geotextile indicator fabric would be placed in excavated areas to prevent mixing of clean surface gravel with contaminated subsurface material and to provide an indicator layer during any future subsurface work. Excavated areas would then be capped with a compacted gravel surface meeting site operational requirements.
  - Removal of the top 1 foot of contaminated soil to support pavement placement. Excavation depth would vary across the Site based on geotechnical conditions and existing grades. Excavated areas would be backfilled with compacted base course material as necessary, and asphalt pavement would be placed. Stormwater infrastructure would be installed in paved areas to manage stormwater runoff.
  - Potential targeted deeper soil source removal, up to 3 to 4 feet bgs, may be conducted in limited areas if it is determined during the remedial design process

that doing so would meet CULs, which in turn would reduce long-term costs associated with groundwater attenuation monitoring and cap maintenance and monitoring.

- **Deeper Soil Source Removal:** Deeper excavation of copper- and zinc-contaminated soil contributing to copper and zinc exceedances in groundwater will be conducted in CA 2. The extent of soil excavation will be determined during remedial design based on the results of additional data collection.
- **Contingency Actions:** The following contingency actions may be implemented in CA 2 or CA 3, respectively, depending on findings during remedial design:
  - Soil solidification/stabilization is a contingency measure that may be conducted in CA 2, if excavation of soil to CULs determined during design is not possible due to geotechnical or other constraints.
  - Bioremediation for treatment of groundwater is a contingency measure that may be conducted in CA 3 if remedial design sampling indicates additional cleanup is required near the 2018 Interim Action to address contamination in groundwater.
- **Natural Attenuation and Monitoring:** The selected cleanup includes natural attenuation of groundwater and long-term monitoring to document conditions until compliance with cleanup standards is achieved.
- **Institutional Controls:** The implementation of institutional controls in the form of an Environmental Covenant that will place a number of general and specific prohibitions, restrictions, and requirements on activities on certain parcel(s) at the Site. Institutional controls would also include implementation of an Operations, Management, and Monitoring Plan (OMMP) that would specify soil management procedures and health and safety requirements for future excavation work.

Together, these individual technologies will manage the exposure pathways to all contamination in Site soils and groundwater.

3.2.3.1 Compliance with MTCA Requirements

The selected cleanup actions for the uplands and sediments were evaluated separately in detail in the RI/FS for compliance with MTCA requirements. The proposed cleanup alternatives for the upland areas have been selected for implementation at the Site and are identified as the actions that provide the greatest degree of benefit for the associated cost. Cleanup actions are required to, at a minimum, meet cleanup standards, comply with ARARs, and provide for a reasonable restoration timeframe. These minimum requirements are discussed in Sections 3.3 through 3.5.

The following bullets summarize the evaluation conducted in the RI/FS for the upland area and describe why the selected cleanup action for upland soils and groundwater was identified as the action that was permanent to the maximum extent practicable using a disproportionate cost analysis.

- **Overall Protectiveness:** Overall environmental quality will improve by implementing the selected cleanup action through source removal, capping, monitoring, and the

implementation of institutional controls. Contaminated soil removal will reduce existing risks and the source of groundwater contamination. Capping and installation of a stormwater conveyance system, if necessary, would reduce infiltration of stormwater and reduce leaching of metals into groundwater Site-wide. The selected remedy also includes bioremediation amendments to treat TPH and potentially reduce contamination further in groundwater, if determined necessary.

- **Permanence:** The selected cleanup action provides a significant reduction in contaminant toxicity or volume. There will be a reduction in contaminant volume through the excavation of surface soil to support the placement of the cap. Additional reduction in the mobility of metals in soil would be accomplished through capping (which reduces infiltration and leaching of contaminants from soil to groundwater). The removal of metals- and TPH-contaminated soil associated with the cleanup action will be an effective method for permanent contaminant volume reduction. In addition, the primary source of metals contamination to the environment (historical operations) will no longer be present, and any future operations with potential to release contaminants to the environment will be managed through operational BMPs.
- **Effectiveness over the Long-Term:** Both excavation and capping are common technologies that will remove contaminants or block exposure pathways, respectively; however, caps will require maintenance and institutional controls in perpetuity. The degree of certainty for success to remediate groundwater is high because the Interim Action has already removed the majority of TPH-contaminated soil from the Site. A contingent application of bioremediation amendment, if needed, will increase the certainty of success. The degree of certainty to remediate groundwater in CA 2 is moderate, because not all source material will be removed; however, deeper "hot spot" excavation of copper- and zinc-contaminated soil and caps reducing infiltration will increase the certainty of success. This alternative will be reliable as long as the cap is properly maintained and institutional controls are followed. The magnitude of residual risk associated with this alternative is moderate to low because much of the surface contamination will be excavated or capped. Potential future risks will be controlled through the enforcement of institutional controls and an OMMP, which are considered to be effective risk management tools.
- **Short-Term Risk Management:** During construction, contaminated surface soil will be handled and removed from the Site to support cap placement. There is moderate short-term risk to human health and the environment during implementation because excavation requires some contaminated materials handling. There is also a low risk for public exposure with this alternative because contaminated soil would be transported from the Site for disposal over public roadways; however, the excavated soil would be managed by licensed professionals with appropriate training. Site activities require appropriate personal protective equipment, BMPs, and appropriate training requirements for management of risks to workers. These controls are highly effective and anticipated to adequately manage short-term risk.

- **Technical and Administrative Implementability:** This cleanup action is technically possible to implement and involves use of common technologies, methods, and equipment. All necessary offsite facilities, materials, and services are available within the region and are accessible. This cleanup action complies with all applicable administrative and regulatory requirements and will be managed and constructed by specialty professionals familiar with the type of work. Site access for construction and long-term monitoring is available because the Port is the landowner and the party conducting the cleanup. Implementation of this alternative may be phased to minimize impacts to site operations and will be coordinated with the site tenant at the time of construction. The cleanup action can be integrated with both existing and proposed future Site uses.
- **Consideration of Public Concerns:** The RI/FS went through a public review process before finalization. This CAP will be subject to public review and comment, and Ecology will consider public comments and concerns during finalization of the CAP.

3.2.3.2 Additional Cleanup Action Considerations

The cleanup action supports future use of the Site by leaving all existing buildings and pavement in place. These areas, which currently serve as a cap to subsurface soil, are protective of the direct contact exposure pathway. The existing buildings and pavement will be maintained as caps, in accordance with Site institutional controls, in perpetuity or until those areas are redeveloped, at which point new caps will be installed or contaminated soil excavated to maintain protectiveness.

The cleanup action also includes institutional controls to manage contamination left in place and to ensure maintenance of the remedial action. Institutional controls will include an environmental deed restriction limiting Site uses that may damage or disturb the implemented remedy or result in exposure of contaminants remaining on the Site. Institutional controls will require implementation of an Ecology-approved OMMP specifying soil management procedures for future excavation or remedy-disturbing actions and health and safety requirements for future subsurface work in areas where contamination remains on the Site. These procedures will be applicable to any future Site redevelopment or maintenance that involves disturbance of the constructed remedy.

3.3 CLEANUP STANDARDS AND POINT OF COMPLIANCE

As stated in previous sections, the selected cleanup action complies with cleanup standards through the removal of contaminated soil and sediment, or containment of contaminated soil or sediment remaining in place to control the potential for exposure to humans or ecological receptors. CULs and POCs for Site COCs are detailed in Section 2.3.

3.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The cleanup action must comply with MTCA cleanup regulations (WAC 173-340), SMS (WAC 173-204), federal laws, and substantive requirements of applicable local and state laws. Together, these requirements, regulations, and laws are identified as ARARs for the Site. Under WAC 173-

340-350 and WAC 173-340-710, the term "applicable requirements" includes: regulatory cleanup standards; standards of control; and other environmental requirements, criteria, or limitations established under state or federal law that specifically address a remedial action, location, COC, or other circumstance at the Site. The "relevant and appropriate requirements" are regulatory requirements or guidance that do not apply to the Site under law but have been determined to be appropriate for use by Ecology. ARARs are often categorized as location-specific, action-specific, or chemical-specific.

The cleanup action complies with all ARARs that are outlined in the RI/FS. Chemical-specific ARARs are met through compliance with applicable CUL criteria and are summarized in Table 3.1. Location-specific ARARs are met through compliance with all applicable state, federal, and local regulations in place for the Site and are summarized in Table 3.2. Applicable action-specific ARARs will be met through implementation of construction activities in compliance with all applicable construction-related requirements, such as health and safety restrictions, Site use and other local permits, and disposal requirements for excavated soil. Table 3.3 identifies action-specific ARARs considered for applicability to the Site.

3.5 RESTORATION TIMEFRAME

The anticipated restoration timeframes for the cleanup action differ by media and are as follows:

- **Soil:** Soil cleanup standards are expected to be met following completion of construction through source removal and containment of contamination remaining on the Site.
- **Groundwater:** CULs are expected to be met at the CPOC within 2 to 5 years from completion of construction.
- **Sediment:** Sediment Cleanup Standards are expected to be met immediately following completion of construction (expected to occur over 2 to 3 in-water construction seasons, depending on work phasing to allow for any Site overwater operations to occur during construction).

3.6 COMPLIANCE MONITORING

Compliance monitoring requirements associated with remedy implementation consist of protection monitoring during construction activities, performance monitoring to ensure that remedy construction is in accordance with the project plans and design, and confirmation monitoring following remedy completion to confirm compliance with cleanup standards. Details of compliance monitoring are provided in Section 14.2 of the RI/FS. Compliance monitoring will take place and will be established in a Compliance Monitoring Plan to be submitted to Ecology for review and approval.

3.6.1 Protection Monitoring

Protection monitoring will be conducted during both remedy construction and operation and maintenance activities to confirm the protection of human health and the environment.

Protection monitoring requirements for worker safety will be described in Health and Safety Plans, and environmental protection monitoring will be described in the OMMP and Dredge Management Plan or equivalent documents developed as pre-construction submittals.

3.6.2 Performance Monitoring

Performance monitoring activities will be conducted for both the uplands and sediment during remedy construction and for groundwater throughout the restoration timeframe. Performance monitoring will consist of the following:

- Chemical sampling during excavation and dredging to ensure that contaminant removal achieves remedial goals.
- Quality control monitoring for construction activities, such as survey confirmation of excavation extents, and imported material chemical and geotechnical testing.
- Sediment monitoring and physical monitoring (surveys) during cap placement to confirm the constructed sediment caps meet design requirements.
- Groundwater monitoring during the natural attenuation period following remedy construction, until groundwater achieves compliance with cleanup standards at the CPOC.

3.6.3 Confirmation Monitoring

Confirmation monitoring activities will be conducted for both the uplands and sediment following completion of the remedy, and once groundwater achieves compliance with cleanup standards. Confirmation monitoring will consist of the following:

- Routine inspections of capped areas to verify that the constructed remedy remains effective.
- Routine inspections of the intertidal sediment caps to ensure stability of the backfilled intertidal sediment area and bulkhead toe berms.
- Routine inspections of the constructed granular sediment caps to ensure stability and effectiveness.
- Routine groundwater monitoring for TPH and metals in all Site compliance wells (downgradient, along the shoreline) after compliance with cleanup standards has been achieved in the compliance well network.

3.7 REMEDIAL DESIGN PROCESS

During the remedial design process, additional data will be collected at the Site to inform the final extents of cleanup required. Remedial design sampling will be conducted on the remainder of the Site to determine the specific location and extents of dredging, capping, and excavation.

- Additional soil data will be collected during design from the top approximately 3 feet of the Site in unpaved areas to determine where remediation is required and the type

of cap to be installed (crushed rock or asphalt). Site operational needs and potential redevelopment plans that are determined prior to final remedial design will also be considered in selection of the cap type installed in each area.

- Soil data will also be collected from deeper zones in selected areas to refine the extent of copper and zinc contamination in soil that may be impacting groundwater quality.
- Additional sediment data will be collected during design of the cleanup from subtidal and intertidal areas to refine the extent of sediment cleanup required for compliance with cleanup standards, including both SWAC criteria and point-by-point criteria, as applicable (refer to Section 2.3.1).
- Groundwater data will be collected during design to confirm the current groundwater quality, evaluate the necessity of bioremediation contingency measures in the area of the 2018 Interim Action, and to gather additional data to assist with determination of the soil RALs that will be protective of the soil leaching to groundwater pathway.

3.8 SCHEDULE FOR IMPLEMENTATION

The following implementation steps will be conducted to finalize the CAP and successfully perform the cleanup action. Estimated durations are provided for discussion and planning purposes:

Implementation Step	Estimated Duration
Prepare and Submit Draft CAP (completed)	Fall 2020
Public Comment Period for Draft CAP (completed)	Winter 2020
Finalize and Submit Final CAP (completed)	February 2021
Amend Agreed Order for Inclusion of Remedial Design	90 days
Submit Remedial Design Sampling Plan and Receive Ecology Approval	Spring 2021
Conduct Remedial Design Sampling and Prepare Data Report	Summer 2021
Prepare Engineering Design Report	2021
Prepare Remedial Action Construction Documents (plans and specifications)	2021–2022
Acquire Project Permits	2021–2022
Finalize Consent Decree between the Port and Ecology for Remedy Implementation	2022
Remedial Action Construction; assume duration of 2 to 3 years	2022–2024
Prepare Remedial Action Completion Report, OMMP, and Compliance Monitoring Plan; Receive Ecology Approval; and Initiate Confirmation Groundwater Monitoring	2024
Conduct Confirmation Groundwater Monitoring	2024–2029
Conduct Sediment Cap Monitoring Program	20 years after completion of construction

3.9 INSTITUTIONAL/ENGINEERING CONTROLS

Because contamination will remain on the Site beneath containment caps in soil and sediment in excess of cleanup standards, the Site remedy includes institutional controls. These institutional controls protect workers at the Site and the public from contacting these contained contaminated media while contamination remains on the Site in excess of CULs.

For soil, institutional controls will include the following:

- A deed restriction (restrictive covenant) that restricts and limits future Site uses to those compatible with the implemented remedy
- An OMMP developed for the Site that will specify procedures and health and safety requirements applicable for site redevelopment or maintenance that involves excavation, earthwork, or other activities that may result in contact with contaminated soils or groundwater

For sediment in capped areas (e.g., the marine railway, intertidal zones, and areas beneath piers/docks), institutional controls will include the following:

- Requirements for managing contaminated sediment that may remain in place beneath caps placed under structures in the intertidal and subtidal sediment areas and beneath the bulkhead toe berm
- For capped areas on state-owned property, the institutional controls may be undertaken using a variety of administrative mechanisms, including a remediation easement between DNR and the Port, documentation in DNR geospatial records, and an administrative agreement between DNR and Ecology.
- Requirements for future development in capped areas so that the caps are not compromised or are reconstructed if disturbed
- Requirements for contaminated sediment handling and containment and/or disposal if piers/docks or the marine railway structures are renovated, replaced, or demolished in the future

3.10 PUBLIC PARTICIPATION

The draft CAP was distributed for public review and comment between December 7, 2020, and January 20, 2021. Following the public comment period, no revisions were required to this CAP to address comments received.

4.0 References

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Harris Avenue Shipyard

Cleanup Action Plan

Tables

Table 3.1
Potential Chemical-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Sediment Requirements		
Sediment Management Standards (SMS; WAC 173-204)	Establishes standards for the quality of surface sediment in Washington state. These standards provide chemical concentration criteria, which identify surface sediment without adverse effects on biological resources and no significant health risk to humans.	Applicable.
Groundwater Requirements		
Model Toxics Control Act (MTCA; WAC 173-340)	Establishes Washington state administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	Applicable; Site is regulated under MTCA and must meet MTCA standards.
Drinking Water Standards—State MCLs (WAC 246-290-310)	Establishes standards for contaminant levels in drinking water for water system purveyors.	Not applicable; highest potential future beneficial use at the Site is not drinking water.
Washington State Maximum Contaminant Levels (WAC 246-290-310)	Washington state maximum contaminant levels (MCLs) are presented in WAC 246-290-310. These are standards that are generally promulgated by the United States Environmental Protection Agency (USEPA) and adopted by Washington State to protect for drinking water quality. An MCL is the legal threshold limit on the amount of a substance that is allowed in public water systems under the Safe Drinking Water Act.	Not applicable; maximum containment levels pertain to protection of groundwater for drinking water. Groundwater at the Site has been determined to be non-potable.
Water Quality Standards for Groundwaters of the State of Washington (WAC 173-200)	Implements the Water Pollution Control Act and the Water Resources Act of 1971 (90.54 RCW).	Not applicable to sites undergoing cleanup actions under MTCA, according to WAC 173-200-010(3)(c).
Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A)	The Surface Water Standards establish water quality standards for surface waters of the State of Washington. Water quality standards require that toxic substances shall not be introduced beyond the mixing zone greater than levels that have the potential to adversely affect characteristic water users, cause acute or chronic toxicity to the most sensitive biota, or adversely affect public health.	Applicable.
Total Maximum Daily Loads Established under Section 303(d) of the Clean Water Act (CWA; 40 CFR Part 130)	Requirements for water quality planning, management and implementation, and non-construction management sections of the Clean Water Act.	Not applicable; the water surrounding the Site is not on the 303(d) list and is not subject to total maximum daily load.
Water Quality Criteria Established under Section 304(a)(1) of the Clean Water Act (33 USC 1314)	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121(d)(2) requires the USEPA to consider whether nationally recommended Ambient Water Quality Criteria should be relevant and appropriate requirements at a site. Section 401 of the Clean Water Act requires the establishment of guidelines and standards to control the direct or indirect discharge of pollutants to the waters of the United States. Section 401 of the Clean Water Act requires the state to certify that federal permits are consistent with RCW 90.48 and WAC 173-201A. This may include the issuance of a 401 Water Quality Certification. Section 402 establishes the NPDES, which provides for the issuance of permits to regulate discharges to navigable waters.	Section 401 is applicable. Requirements under Section 402 are discussed under action-specific ARARs for NPDES issues related to construction.

Table 3.1
Potential Chemical-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Groundwater Requirements (cont.)		
National Toxics Rule (NTR; 40 CFR 131.36 et seq)	NTR promulgates for 14 states (Washington included) the chemical-specific, numeric criteria for priority toxic pollutants necessary to bring states into compliance with Section 303(c)(2)(B) of the Clean Water Act.	Applicable.
Washington Water Quality Standards Clean Water Act (40 CFR 131.45)	Clean Water Act-Effective Human Health Criteria Applicable to Washington were promulgated under 40 CFR Part 131.36 and were moved into 40 CFR 131.45 to have one comprehensive human health criteria rule for Washington. They became effective on December 28, 2016.	Applicable.
MTCA Method B Surface Water Cleanup Standards (WAC 173-340-730(3))	WAC 173-340-730(3)(b)(iii) establishes that MTCA Method B values should be considered when sufficiently protective health-based criteria or standards have not been established under applicable state and federal laws.	Applicable only if sufficiently protective health-based criteria or standards have not been established under applicable state and federal laws.
SMS (WAC 173-204)	Establishes standards for the quality of surface sediment in Washington state. These standards provide chemical concentration criteria, which identify surface sediment without adverse effects on biological resources and no significant health risk to humans.	Applicable.
Vapor Intrusion	Ecology's Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, as revised in 2015, identifies volatile organic compounds (as defined by WAC 173-340-200) and other substances and their respective screening levels that may pose a vapor intrusion threat. This pathway must be evaluated at sites where volatile contaminants are present within the vertical separation distances and lateral inclusion zone.	Not applicable; there are currently no slab-on-grade buildings within the vertical separation distance and lateral inclusion zone.
Soil Requirements		
Model Toxics Control Act (WAC 173-340)	Establishes Washington state administrative processes and standards to identify, investigate, and clean up facilities where hazardous substances are located.	Applicable; Site is regulated under MTCA and must meet MTCA standards.
Vapor Intrusion	Ecology's Updated Process for Initially Assessing the Potential for Petroleum Vapor Intrusion memorandum establishes TPH and BTEX concentrations in soil to quantify the total vapor phase concentrations of hydrocarbons within the vertical separation distance. This pathway must be evaluated at sites where volatile contaminants are present within the vertical separation distances and lateral inclusion zone.	Not currently applicable; there are currently no slab-on-grade buildings within the vertical separation distance and lateral inclusion zone. May be applicable in the future if new building construction occurs over areas of contamination.

Abbreviations:

ARAR	Applicable or Relevant and Appropriate Requirement
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
CFR	Code of Federal Regulations
MCL	Maximum Contaminant Level
NPDES	National Pollutant Discharge Elimination System
RCW	Revised Code of Washington
TPH	Total Petroleum Hydrocarbons
USC	United States Code
WAC	Washington Administrative Code

Table 3.2
Potential Location-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Shoreline, Wetlands, and Other Critical Areas		
Coastal Zone Management Act (16 USC 1451 et seq.)	Construction activities requiring federal approval must be consistent with the state's Coastal Zone Management Program.	Applicable; implemented through Washington State Shoreline Master Program.
City of Bellingham—Shoreline Master Program (BMC Title 22) (Implements the Washington Shoreline Management Act)	Implements the requirements imposed on the City of Bellingham by the Washington Shoreline Management Act (RCW 90.58) and ensures that development under the program will not cause a net loss of ecological functions.	Applicable; Harris Avenue Shipyard is located within the waters of Washington State in the City of Bellingham.
City of Bellingham—Critical Areas Regulations (BMC Chapter 16.55)	This chapter establishes regulations pertaining to the development within or adjacent to critical areas, which include areas that provide a variety of biological and physical functions that benefit the City of Bellingham and its residents, including water quality protection, fish and wildlife habitat, food chain support, etc.	Applicable; the presence of Bull trout, Puget Sound Chinook salmon, Puget Sound Coho salmon, marbled murrelets, and sand lance spawning areas designate the area as a fish and wildlife habitat conservation area.
Executive Order 11988, Protection of Floodplains (40 CFR 6.302(b) and Appendix A); Federal Emergency Management Agency (FEMA) National Flood Insurance Program Regulations (44 CFR 60.3)	In 100-year floodplains, actions must be taken to reduce the risk of flood loss, minimize the impact of floods on human safety, and restore and preserve the natural beneficial values of floodplains.	Applicable; Harris Avenue Shipyard is located within a designated floodplain. Model Toxics Control Act remedial actions are exempt from the procedural requirements of the local and state laws but must comply with the substantive requirements.
Washington Floodplain Management Plan (RCW 86.16; WAC 173-158)	Directs Ecology (1) to establish minimum state requirements for floodplain management, which equal the National Flood Insurance Program (NFIP) minimum standards; (2) to provide technical assistance and information to local governments related to administration of their floodplain management ordinances and the NFIP; and (3) to provide assistance to local governments in identifying the location of the 100 year (base) floodplain. Also allows for the issuance of regulatory orders.	
City of Bellingham—Construction in Floodplains (BMC Chapter 17.76)	Upland development or construction within any area of special flood hazard within the City of Bellingham must undergo review by the Director of Public Works and Utilities to ensure that the proposed work would not adversely affect the flood carrying capacity of the area of special flood hazard. A development permit must be issued before construction or development begins.	
In-Water		
Washington State Hydraulic Code (RCW 77.55, WAC 220-110)	This statute and its implementing regulations apply to any work conducted within the designated shoreline that changes the natural flow or bed of the water body (and, therefore, has the potential to affect fish habitat). The requirements include bank protections and prohibited work times based on life stages of endangered or threatened fish species.	Applicable; Model Toxics Control Act remedial actions are exempt from the procedural requirements of this law, but must comply with the substantive requirements.

Table 3.2
Potential Location-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
In-Water (cont.)		
Section 10 of the Rivers and Harbors Act (33 USC 401 et seq.; Rivers and Harbors Act, Section 10; 33 CFR Parts 320 to 322)	This act prohibits unauthorized activities that obstruct or alter a navigable waterway. Section 10 applies to all structures or work below the mean high water mark of navigable tidal waters and the ordinary high water mark of navigable fresh waters. Actions in wetlands within these limits are subject to Section 10 provisions. U.S. Army Corps of Engineers permits are needed for the alteration or the modification of the course, condition, location, or capacity of a navigable water of the United States.	Applicable; Bellingham Bay is a navigable water, any alternatives involving in-water work will require compliance with Rivers and Harbors Act.
Section 404 of the Clean Water Act (33 USC 1311-1341; 33 CFR 320, 323, and 330; 40 CFR Parts 230-231)	Regulates activities that may result in any discharge into navigable waters, and permits for discharge of dredged or fill material into navigable waters.	Applicable; the selected alternative may include dredging or filling along the shoreline or within Bellingham Bay.
Protection of Wildlife and Habitat		
Endangered Species Act (16 USC Chapter 35 §1531 et seq.; 50 CFR Part 17; 50 CFR Part 402; Title 77 or 79 RCW)	Section 7 of Endangered Species Act requires that federal agencies consult with Natural Resources Trustees if listed threatened or endangered species are present in or near the project area, before making any decisions that may affect these species.	Listed species migrate through Bellingham Bay; therefore, agency consultation and compliance with the Endangered Species Act are required.
Magnuson-Stevens Act (16 USC § 1801 et seq.)	The Magnuson-Stevens Act (MSA) governs marine fisheries management in the United States. The MSA mandates the identification of essential fish habitat for federally managed species and development of measures to conserve and enhance the habitat necessary for the fish life cycles.	Applicable.
Migratory Bird Treaty Act (16 USC 703-712.)	Establishes federal responsibility for the protection of the international migratory bird resource and requires continued consultation with the USFWS during remedial design and construction to ensure that the cleanup of the site does not unnecessarily impact migratory birds.	Applicable.
Bald Eagle Protection Act (16 USC 668 et seq.)	Requires continued consultation with USFWS during remedial design and construction to ensure that any cleanup of the site does not unnecessarily adversely affect the bald or golden eagle.	Applicable.
Tribal and Cultural Protections		
Native American Graves Protection and Repatriation Act (25 USC Chapter 32 §3001 through 3113; 43 CFR Part 10) Protection of Indian Graves (RCW 27.44) Archaeological Sites and Resources (RCW 27.53)	These statutes prohibit the destruction or removal of Native American cultural items and require written notification of inadvertent discovery to the appropriate agencies and Native American tribe. These programs are applicable to the remedial action if cultural items are found. The activities must cease in the area of the discovery; a reasonable effort must be made to protect the items discovered; and notice must be provided.	Applicable.

Table 3.2
Potential Location-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Tribal and Cultural Protections (cont.)		
Archaeological Resources Protection Act (16 USC 470aa et seq.; 43 CFR Part 7)	This program sets forth requirements that are triggered when archaeological resources are discovered. These requirements only apply if archaeological items are discovered during implementation of the selected remedy.	Applicable.
National Historic Preservation Act (16 USC 470 et seq.; 36 CFR Parts 60, 63, and 800)	This program sets forth a national policy of historic preservation and provides a process that must be followed to ensure that impacts of actions on archaeological, historic, and other cultural resources are protected.	Applicable.
Other Regulations to be Considered		
State Aquatic Lands Management Laws (RCW 79.105 through 79.140; WAC 332-30)	Sediment management on state-owned lands must comply with state regulations and rules for management of state-owned aquatic lands.	Applicable.

Abbreviations:

ARAR	Applicable or Relevant and Appropriate Requirement
BMC	Bellingham Municipal Code
CFR	Code of Federal Regulations
Ecology	Washington State Department of Ecology
RCW	Revised Code of Washington
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code

Table 3.3
Potential Action-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Evaluate Environmental Impacts		
State Environmental Policy Act (RCW 43.21C, WAC 197-11, BMC Chapter 16.20)	Establishes the state's policy for protection and preservation of the natural environment.	Applicable; implemented during design and permitting phase to comply with state and City of Bellingham codes. Coordination with federal agencies may be necessary to ensure the SEPA process will meet NEPA requirements. SEPA and MTCA are integrated processes per WAC 197-11-250 through 197-11-268.
Uplands Construction and Grading		
Clean Water Act — NPDES (40 CFR 122) Washington Water Pollution Control Law (RCW 90.48; WAC 173-216; WAC 173-226)	In areas that could potentially erode or release soil, controls and BMPs are to be used to control runoff from construction activities. Requires permits for the discharge of pollutants from any point source into waters of the United States. Washington state has been delegated authority to issue NPDES permits. CWA Sections 401, 402, and 404 require states to adopt water quality standards and implement a NPDES permitting process. The Washington Water Pollution Control Law and regulations address this requirement.	Applicable; any construction or regarding activity will require compliance with NPDES.
City of Bellingham—Construction Codes for Grading (adopted from the State Building Code WAC 51-50/International Building Code)	The provisions of the grading chapter (Appendix J, International Building Code) apply to grading, excavation, and earthwork construction, including fills and embankments.	Applicable; Model Toxics Control Act remedial actions are exempt from the procedural requirements of this law but must comply with the substantive requirements.
Dredging, Filling, and In-water Construction		
Dredged Material Management Program Guidelines (RCW 79.105.500-520; WAC 332-30-166)	Establishes a characterization and permitting process for sediments destined for unconfined open-water disposal.	Not applicable; the selected alternative will not include open water disposal of dredged sediments.
Marine Protection, Research and Sanctuaries Act (PL 92-532; 33 USC 1401-1445) and Ocean Dumping of Dredged Materials Regulations (40 CFR 227; 33 CFR Part 324)	Regulates the open-water disposal of dredged sediments.	Not applicable; the selected alternative will not include open water disposal of dredged sediments.
Solid Waste Management/Minimum Functional Standards for Solid Waste Handling (RCW 70.95 and WAC 173-304)	Establishes minimum standards for handling and disposal of solid waste. Solid waste includes wastes that are likely to be generated as a result of site remediation (e.g., contaminated sediments, construction and demolition wastes, and garbage). Sets minimum functional standards for the proper handling of all solid waste materials originating from residences, and commercial, agricultural, and industrial operations, as well as other sources.	Applicable.
Washington State Hydraulic Code (HPA; RCW 77.55, WAC 220-110)	This statute and its implementing regulations apply to any work conducted within the designated shoreline that changes the natural flow or bed of a water body (and therefore has the potential to affect fish habitat). The requirements include bank protections and prohibited work times based on life stages of endangered or threatened fish species.	Applicable; Model Toxics Control Act remedial actions are exempt from the procedural requirements of this law but must comply with the substantive requirements.

Table 3.3
Potential Action-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Dredging, Filling, and In-water Construction (cont.)		
Section 10 of the Rivers and Harbors Act (33 USC 401 et seq.; Rivers and Harbors Act, Section 10; 33 CFR Parts 320 to 322)	This act prohibits unauthorized activities that obstruct or alter a navigable waterway. Section 10 applies to all structures or work below the mean high water mark of navigable tidal waters and the ordinary high water mark of navigable fresh waters. Actions in wetlands within these limits are subject to Section 10 provisions. U.S. Army Corps of Engineers permits are needed for the alteration or the modification of the course, condition, location, or capacity of a navigable water of the United States.	Applicable; Bellingham Bay is a navigable water, any alternatives involving in-water work will require compliance with Rivers and Harbors Act.
Section 404 of the Clean Water Act (33 USC 1311-1341; 33 CFR 320, 323, and 330; 40 CFR Parts 230 to 231)	Regulates activities that may result in any discharge into navigable waters, and permits for discharge of dredged or fill material into navigable waters.	Applicable; the selected alternative may include dredging or filling along the shoreline or within Bellingham Bay.
City of Bellingham – Building Codes (BMC Chapter 17.10)	The provisions of the building codes chapter apply to erection, demolition and moving of buildings, structures and building service equipment.	Applicable; Model Toxics Control Act remedial actions are exempt from the procedural requirements of this law but must comply with the substantive requirements.
Upland Disposal of Soils and Dredged Sediments		
Resource Conservation and Recovery Act (42 USC Chapter 82 §6901 et seq.), Title D, Solid Waste, and Title C, Solid Hazardous Waste	Establishes requirements for the identification, handling, and disposal of hazardous and non-hazardous waste.	Applicable.
Resource Conservation and Recovery Act (40 CFR Parts 260 to 268)	Dredged material may be subject to RCRA regulations if it contains a listed waste, or if it displays a hazardous waste characteristic (e.g., under Toxicity Characteristic Leaching Procedure).	Applicable only if waste is generated from selected alternative, and contains listed waste, or displays hazardous waste characteristics.
Hazardous Waste Management (RCW 70.105) Dangerous Waste Regulations (WAC 173-303)	Establishes regulations that are the state equivalent of RCRA requirements for determining whether a solid waste is a state dangerous waste. This regulation also provides requirements for the management of dangerous wastes if dangerous wastes are generated during the cleanup action.	Applicable.
Solid Waste Disposal Act (42 USC Sec. 325103259, 6901-6991; 40 CFR 257,258) Federal Land Disposal Requirements (40 CFR Part 268)	Protects health and the environment and promotes conservation of valuable material and energy resources.	Applicable.
Minimum Functional Standards for Solid Waste Handling (WAC 173-304)	Sets minimum functional standards for the proper handling of all solid waste materials originating from residences, commercial, agricultural, and industrial operations as well as other sources.	Applicable.
Solid Waste Handling Standards (WAC 173-350)	Establishes minimum standards for handling and disposal of solid waste. Solid waste includes wastes that are likely to be generated as a result of site remediation, including contaminated soils, construction and demolition wastes, and garbage.	Applicable.
Health and Safety for Hazardous Waste Operations and Emergency Response (WAC 296-62; and Health and Safety 29 CFR 1901.120)	The HAZWOPER regulates health and safety operations for hazardous waste sites. The health and safety regulations describe federal requirements for health and safety training for workers at hazardous waste sites.	Applicable; any cleanup work will require compliance with OSHA and WISHA.

Table 3.3
Potential Action-Specific ARARs

Standard, Requirement, or Limitation	Description	Applicability
Worker Safety		
Occupational Safety and Health Act (29 USC 653, 655, 657) Occupational Safety and Health Standards (29 CFR 1910)	Employee health and safety regulations for construction activities and general construction standards as well as regulations for fire protection, materials handling, hazardous materials, personal protective equipment, and general environmental controls. Hazardous waste site work requires employees to be trained prior to participation in site activities, medical monitoring, monitoring to protect employees from excessive exposure to hazardous substances, and decontamination of personnel and equipment.	Applicable; any cleanup work will require compliance with OSHA.
Washington Industrial Safety and Health Act (RCW 49.17) Washington Industrial Safety and Health Regulations (WAC 296-62, WAC 296-155, WAC 296-800)	Adopts the OSHA standards that govern the conditions of employment in all work places. The regulations encourage efforts to reduce safety and health hazards in the work place and set standards for safe work practices for dangerous areas such as trenches, excavations, and hazardous waste sites.	Applicable; any cleanup work will require compliance with WISHA.
Air Quality Controls		
Federal, State, and Local Air Quality Protection Programs State Implementation of Ambient Air Quality Standards NWCAA Ambient and Emission Standards Regional Standards for Fugitive Dust Emissions Toxic Air Pollutants	Regulations promulgated under the federal Clean Air Act (42 USC 7401) and the Washington State Clean Air Act (RCW 70.94) govern the release of airborne contaminants from point and non-point sources. Local air pollution control authorities such as the NWCAA have also set forth regulations for implementing these air quality requirements. These requirements may be applicable to the Site for the purposes of dust control should the selected remedial alternatives require excavation activities. WAC 173-460 establishes ambient source impact levels for arsenic.	Applicable; the selected alternative will require compliance with air quality regulations and BMPs for dust control during structural demolition.
Miscellaneous		
Noise Control Act of 1974 (RCW 70.107, WAC 173-60) (Adopted by City of Bellingham)	Establishes maximum noise levels.	Applicable; the selective alternative will need to comply with local and state noise pollution requirements. Construction and other activities will need to be limited to normal working hours.
National Electrical Code (NFPA 70) and WAC (WAC 296-46B; administrative provisions)	Establishes restrictions and guidelines for temporary and/or permanent electrical installations.	Applicable; compliance required should the selected alternative require temporary electrical power.

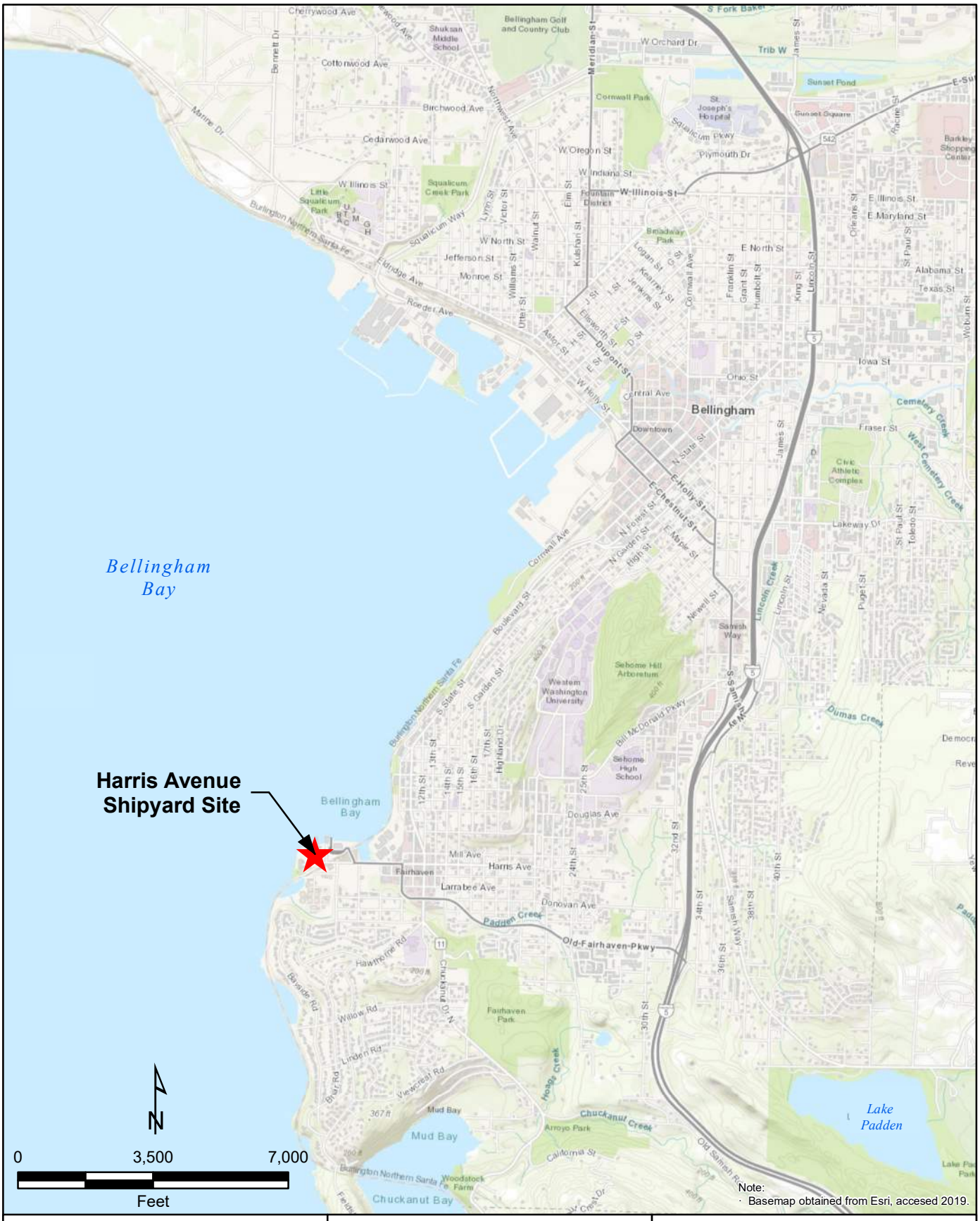
Abbreviations:

ARAR	Applicable or Relevant Appropriate Requirement
BMC	Bellingham Municipal Code
BMP	Best management practice
CFR	Code of Federal Regulations
CWA	Clean Water Act
HAZWOPER	Health and Safety for Hazardous Waste Operations and Emergency Management
HPA	Hydraulic Project Approval
MTCA	Model Toxics Control Act
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NPDES	National Pollutant Discharge Elimination System
NWCAA	Northwest Clean Air Agency
OSHA	Occupational Safety and Health Act
PL	Public Law
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
Site	Harris Avenue Shipyard Site
USC	United States Code
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act

Harris Avenue Shipyard

Cleanup Action Plan

Figures



Note:
· Basemap obtained from Esri, accesed 2019.

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Cleanup Action Plan
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Figure 1.1
Vicinity Map

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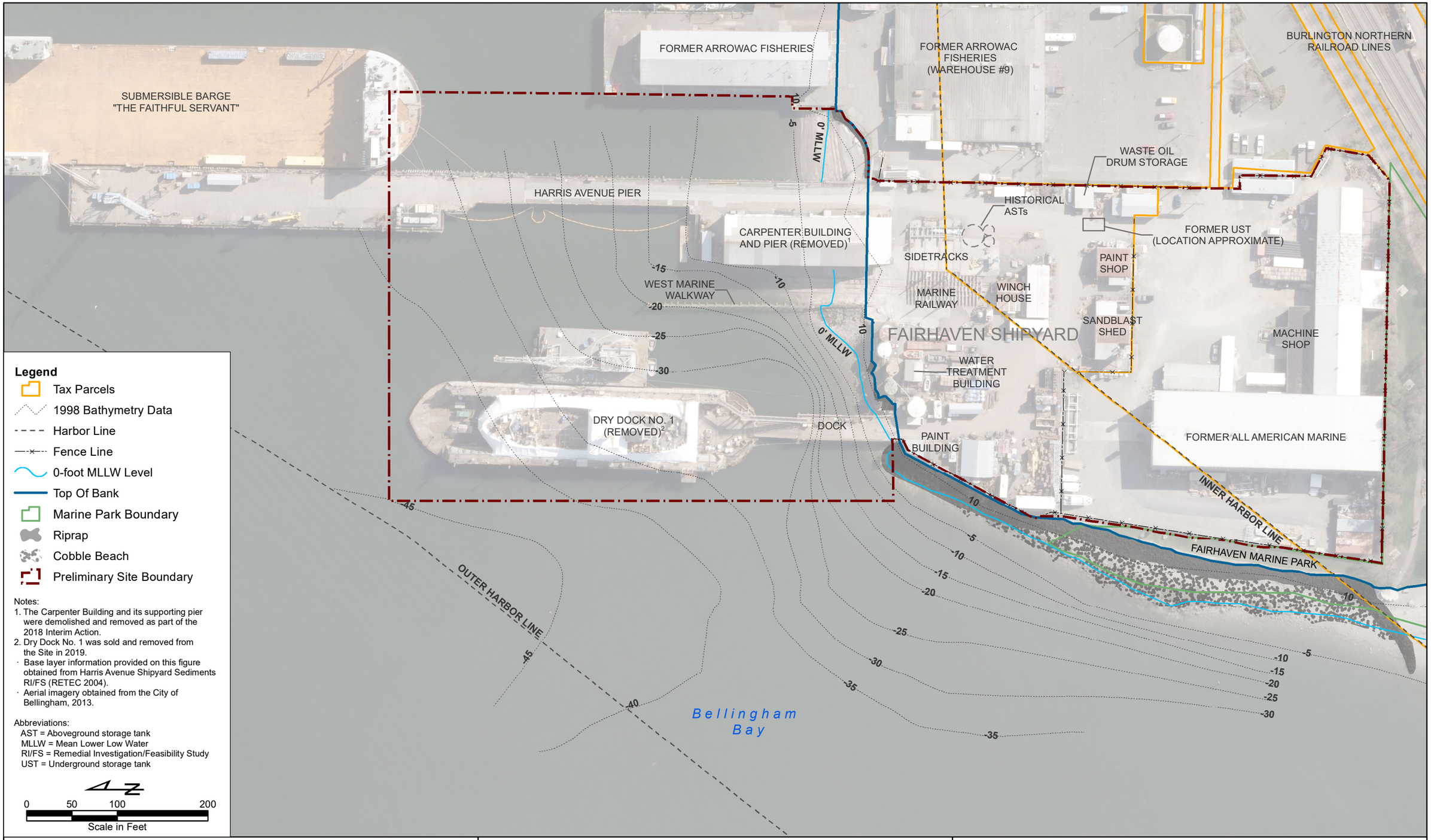

Legend

- Tax Parcels
- 1998 Bathymetry Data
- Harbor Line
- Fence Line
- 0-foot MLLW Level
- Top Of Bank
- Marine Park Boundary
- Riprap
- Cobble Beach
- Preliminary Site Boundary

Notes:

1. The Carpenter Building and its supporting pier were demolished and removed as part of the 2018 Interim Action.
2. Dry Dock No. 1 was sold and removed from the Site in 2019.

· Base layer information provided on this figure obtained from Harris Avenue Shipyard Sediments RI/FS (RETEC 2004).

· Aerial imagery obtained from the City of Bellingham, 2013.

Abbreviations:

AST = Aboveground storage tank
MLLW = Mean Lower Low Water
RI/FS = Remedial Investigation/Feasibility Study
UST = Underground storage tank

N

0 50 100 200

Scale in Feet

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Figure 1.2
Site Map and Key Features

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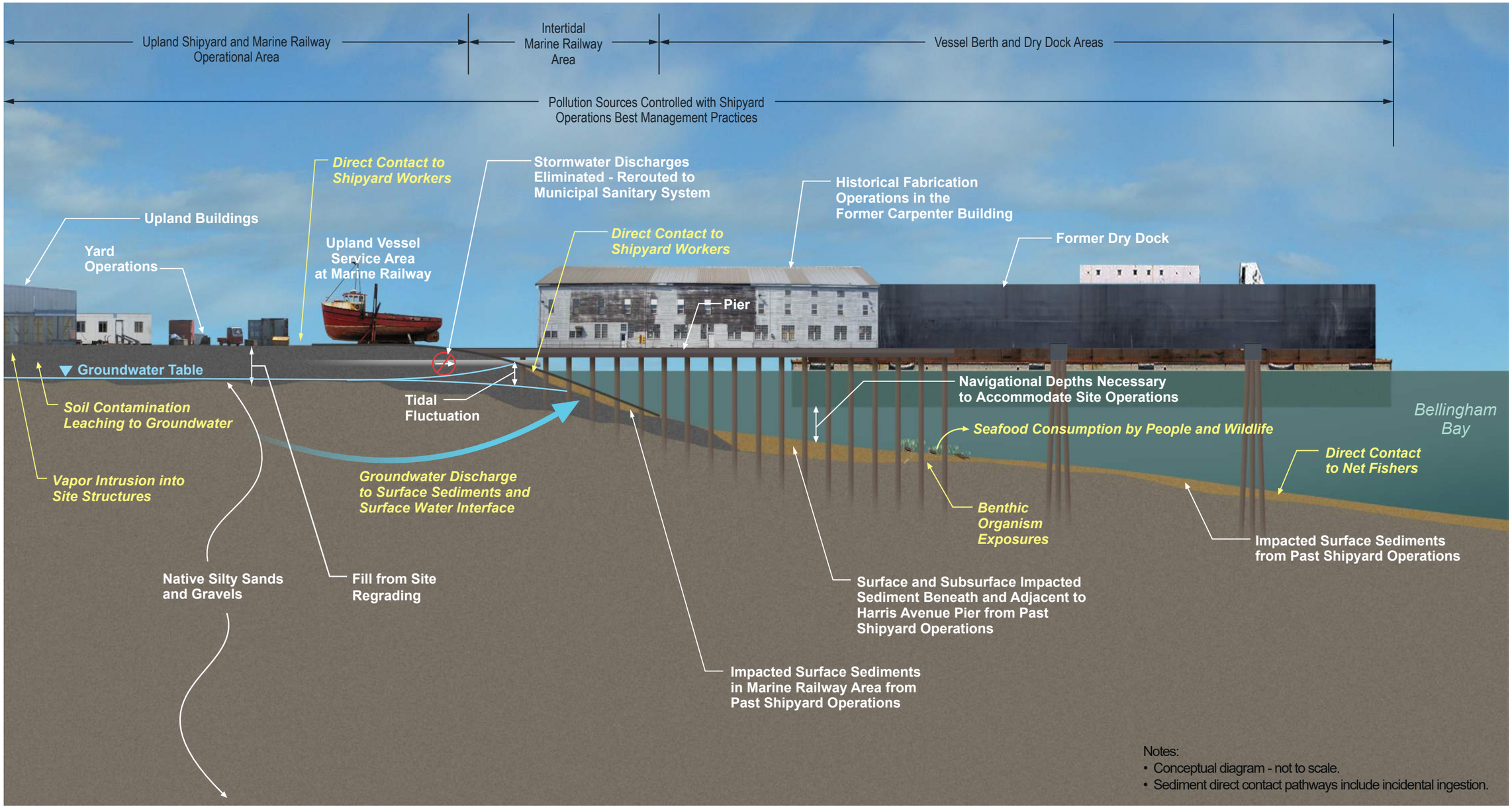
2/11/2020



Notes:
- Conceptual diagram - not to scale.
- Sediment direct contact pathways include incidental ingestion.

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Figure 2.1
Conceptual Site Model

I:\GIS\Projects\POB-HARRIS\AI\dCAP\Figure 2.1 Conceptual Site Model.ai

Legend

- Compliance Monitoring Well
- Site Boundary
- Fence Line
- Harbor Line
- Marine Railway
- Interim Action Completed

Sediment Management Units (SMU)

Dredge to CULs/RALs (SMU 1)
Dredge, 2- to 4-foot average depth, to meet CULs/RALs. Upland disposal or reuse of dredged sediment.

Intertidal Sediment Excavation and Backfill (SMU 2)
Excavate to an average 3-foot depth, and backfill with appropriate habitat substrate to meet existing elevations.

Under-Pier Granular Cap (SMU 3a, SMU 3b)
Place granular cap, 1-foot minimum thickness.

Marine Railway Subtidal Sediment Granular Cap (SMU 4a)
Place granular cap, 1 to 3 feet thick, given clearance between existing mudline and marine railway structures.

Marine Railway Intertidal Sediment Excavation and Granular Cap (SMU 4b)
Targeted excavation and placement of 1-foot minimum thickness granular cap within the marine railway to top of girders.

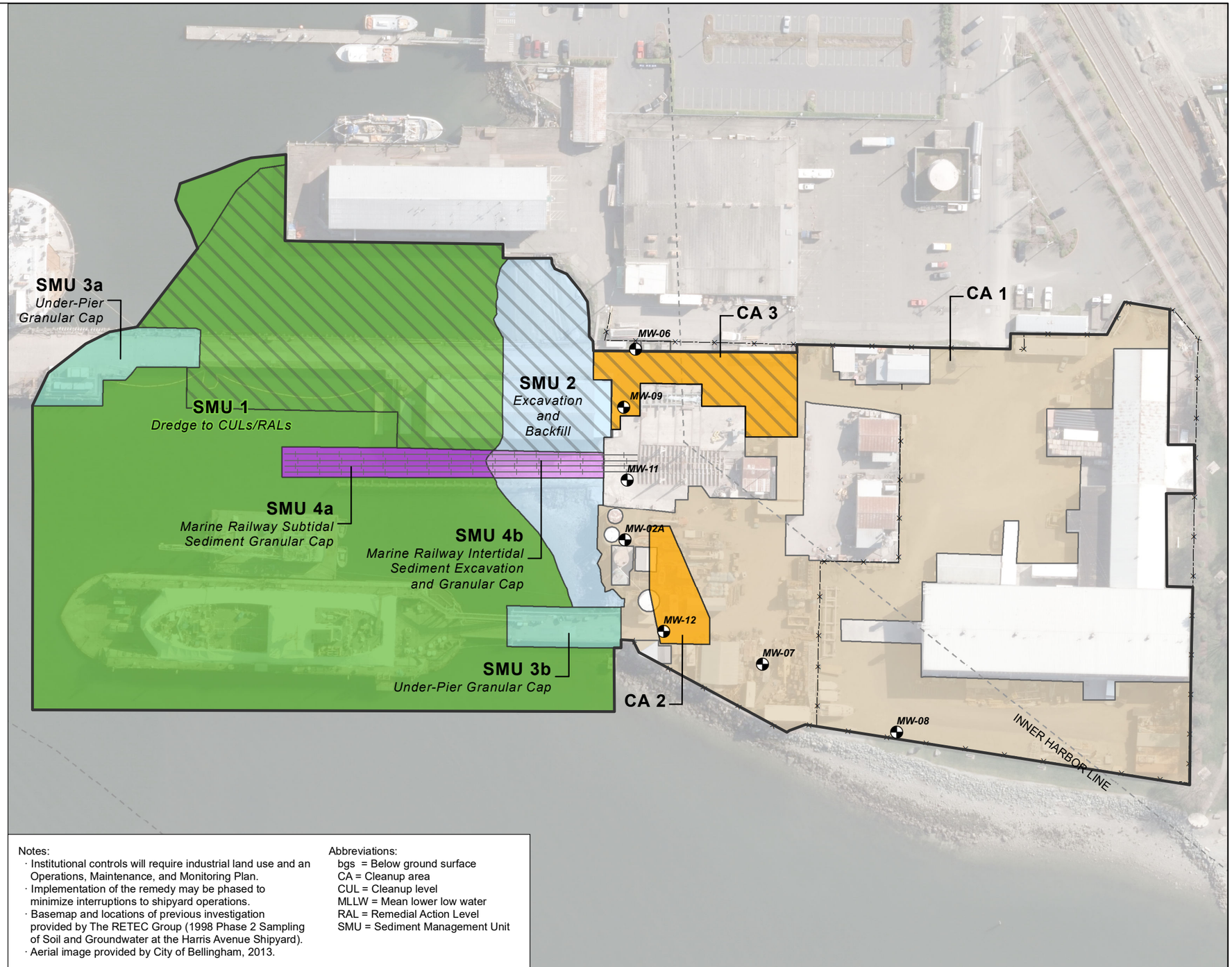
Upland Cleanup Areas (CA)

Shallow Excavation and Capping (CA 1)
Excavate 2 feet bgs and place gravel cap or excavate 1 foot bgs and place asphalt cap. Installation of stormwater conveyance system where necessary.

Deeper Soil Excavation, Contingency Bioremediation (CA 2, CA 3)
Excavate deeper contaminated soil to CULs/RALs based on results of compliance groundwater monitoring.

Existing Structures
Existing buildings and pavement to remain.

0 50 100 200
Scale in Feet



Notes:
- Institutional controls will require industrial land use and an Operations, Maintenance, and Monitoring Plan.
- Implementation of the remedy may be phased to minimize interruptions to shipyard operations.
- Basemap and locations of previous investigation provided by The RETEC Group (1998 Phase 2 Sampling of Soil and Groundwater at the Harris Avenue Shipyard).
- Aerial image provided by City of Bellingham, 2013.

Abbreviations:
bgs = Below ground surface
CA = Cleanup area
CUL = Cleanup level
MLLW = Mean lower low water
RAL = Remedial Action Level
SMU = Sediment Management Unit

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Cleanup Action Plan
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Bellingham, Washington

Figure 3.1
Site-Wide Selected Cleanup Action

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