State of Washington
Department of Ecology

In the Matter of Remedial Action by:
Port of Vancouver
Agreed Order
No. DE 23653

To: Julianna Marler
Chief Executive Officer
Port of Vancouver
3103 NW Lower River Rd
Vancouver, Washington 98660

1. Introduction 2
2. Jurisdiction 2
3. Parties Bound 2
4. Definitions 2
5. Findings of Fact 3
6. Ecology Determinations 7
7. Work to be Performed 8
8. Terms and Conditions 12
    - 8.1 Payment of Remedial Action Costs 12
    - 8.2 Designated Project Coordinators 12
    - 8.3 Performance 13
    - 8.4 Access 14
    - 8.5 Sampling, Data Submittal, and Availability 14
    - 8.6 Public Participation 15
    - 8.7 Access to Information 16
    - 8.8 Retention of Records 16
    - 8.9 Resolution of Disputes 17
    - 8.10 Extension of Schedule 18
    - 8.11 Amendment of Order 19
    - 8.12 Endangerment 20
    - 8.13 Reservation of Rights 20
    - 8.14 Transfer of Interest in Property 21
    - 8.15 Compliance with Applicable Laws 21
    - 8.16 Indemnification 23
9. Satisfaction of Order 23
10. Enforcement 23

Exhibit A Interim Action Area
Exhibit B Interim Action Work Plan
Exhibit C Schedule

1. Introduction

The mutual objective of the State of Washington, Department of Ecology (Ecology) and the Port of Vancouver (Port or Subject PLP) under this Agreed Order (Order) is to provide for remedial action at a facility where there has been a release or threatened release of hazardous substances. This Order requires the Port to implement an interim remedial action at the Alcoa Vancouver Site (Site) in Vancouver, Washington. Ecology believes the actions required by this Order are in the public interest. This Agreed Order herein is solely focused on the PCB-Impacted Sediment Area within the larger Alcoa Vancouver Site.

2. Jurisdiction

This Order is issued pursuant to the Model Toxics Control Act (MTCA), RCW 70A.305.050(1).

3. Parties Bound

This Agreed Order shall apply to and be binding upon the Parties to this Order, their successors and assigns. The undersigned representative of each Party hereby certifies that he or she is fully authorized to enter into this Order and to execute and legally bind such Party to comply with this Order. The Port agrees to undertake all actions required by the terms and conditions of this Order. No change in ownership or corporate status shall alter the Port's responsibility under this Order. The Port shall provide a copy of this Order to all agents, contractors, and subcontractors retained to perform work required by this Order, and shall ensure that all work undertaken by such agents, contractors, and subcontractors complies with this Order.

4. Definitions

Unless otherwise specified herein, the definitions set forth in RCW 70A.305, WAC 173-204 and WAC 173-340 shall control the meanings of the terms in this Order.

4.1 Site

The Site is referred to as Alcoa Vancouver. The Site constitutes a facility under RCW 70A.305.020(8). The Site is defined by where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located. Based upon factors currently known to Ecology, the Interim Action Area (Exhibit A) shows where the remedial action will be implemented. The Site description and remedial action are more fully described in the Interim Action Work Plan (Exhibit B).

4.2 Parties

Refers to the State of Washington, Department of Ecology, and the Port.

4.3 Potentially Liable Persons (PLPs)

Refers to Port and Alcoa, Inc.

4.4 Subject PLP

Refers to the PLP (Port) subject to this Order.

4.5 Agreed Order or Order

Refers to this Order and each of the exhibits to this Order. All exhibits are integral and enforceable parts of this Order.

5. Findings of Fact

Ecology makes the following findings of fact, without any express or implied admissions of such facts by the Subject PLP:

5.1

The Site is located at 5701 Northwest Lower River Road, Vancouver, Washington, approximately three miles northwest of downtown Vancouver, Washington. The Site is bounded by the Northwest Lower River Road to the north, the Columbia River to the south, lands owned by Clark County and the Subject PLP to the east, and lands owned by multiple industrial property owners to the west. In-water areas of the Site include properties that owned by the State of Washington, which are managed by the Washington State Department of Natural Resources, and property owned by the Subject PLP.

5.2

The Site is listed on the Department of Ecology's Hazardous Sites List as "Alcoa Vancouver," Facility Site ID No. 21 and Cleanup Site ID No. 2867. The Site encompasses the following sites on the Hazardous Site List: "Alcoa Northeast Parcel" (FS ID 50815458), "Alcoa Vancouver NPL" (FS ID 25), "Alcoa Vancouver PCB" (FS ID 22), "Alcoa Vancouver Rod Mill" (FS ID 24), "Alcoa Vancouver TCE" (FS ID 23), and "Columbia Marine Lines" (FS ID 26).

5.3

Alcoa owned and/or operated a primary aluminum smelter and fabrication facility for approximately 45 years at the Site, until 1986. In 1987, Alcoa discontinued primary aluminum manufacturing operations and sold the smelter and underlying lands, and some other ancillary facilities and lands, to Vanalco, Inc. Vanalco subsequently filed for bankruptcy, and its assets at the Site were purchased by Glencore Washington LLC (now known as Evergreen Aluminum LLC (Evergreen)) in April 2002. No manufacturing operations have taken place at the Site since December 2000. The Port of Vancouver is the current owner of the Site since 2009.

5.4

The Site includes three landfill areas east of the former aluminum smelter property, which were formerly owned by Alcoa. These landfill areas are known as the East Landfill,

the North Landfill, and the North 2 Landfill. The North and North 2 Landfills were remediated in 2004. The southern boundary of the East Landfill is set back approximately 50 feet landward from the top of the bank of the Columbia River. Alcoa also owned the land generally located to the south and southwest of the East Landfill area, including the bank of the Columbia River (above the ordinary high-water mark) and the land located alongside a Clark County Public Utilities (CPU) outfall line (hereinafter "South Bank" or "South Bank Area").

5.5

The Site is situated on the flood plain of the nearby Columbia River. The Site hydrogeology has been characterized by numerous borings, including detailed characterization of the East, North and North 2 Landfills and the National Priorities List (NPL) Site. The groundwater system in the area can be divided into four general hydrogeologic units: the shallow zone, the intermediate zone, the deep zone, and the aquifer zone. The predominant groundwater flow direction beneath the Site is toward the Columbia River in the deeper hydrogeologic units. The shallow zone consists of dredged sand placed on the Site during the late 1940s and early 1950s. A discontinuous, perched water table is located in the shallow zone during the wetter months of the year. The direction of the movement of water in the saturated portions of the shallow zone beneath the Site varies with the time of year and the amount of precipitation. The intermediate zone consists of sandy silt with clay lenses. The deep zone consists of fine to medium sand while the aquifer zone consists of sandy gravel.

5.6

In 1997, polychlorinated biphenyl's (PCBs) were discovered in three Columbia River sediment samples collected by CPU as part of the NPDES permitting requirements for a non-contact cooling water discharge installed approximately 300 feet west of the East Landfill. Alcoa initiated a soil and groundwater investigation of the entire bank/shore of the East Landfill. This work indicates that the East Landfill is not the primary source of the PCBs in the Columbia River sediments. During the investigation, an area of elevated PCBs in soil was discovered on the riverbank to the south and southwest of the East Landfill area, adjacent to the CPU outfall line (now known as the South Bank Area). This is thought to be the major source of the PCB contamination found in the Columbia River adjacent to the cooling water discharge.

5.7

PCBs found in soils in the South Bank Area adjacent to the East Landfill were below the MTCA Method A industrial cleanup level. However, the South Bank Area near the CPU's outfall included approximately 2,500 cubic yards of soil impacted with PCBs at concentrations above the MTCA Method A industrial cleanup level. This material was localized around the location of the CPU outfall to a depth of approximately 15 feet and was excavated in 2003 in accordance with Ecology Agreed Order No. DE 03 TCPIS-5737.

Adjacent to and further downstream from the CPU outfall, sediments of the Columbia River are impacted with PCBs.

5.8

In June of 2008, Ecology issued an Enforcement Order to Alcoa (Ecology Order No. DE 5660). This Enforcement Order required Alcoa to: 1) demolish ore handling facilities next to the dock, 2) remove existing above ground petroleum tank foundations and associated piping east of the dock, 3) remove existing underground petroleum storage tanks located in the river dike west of the dock, 4) conduct petroleum contamination soil sampling after removal of the underground storage tanks and pipelines and, if necessary, perform soil removal, 5) sample and remove any PCB contaminated soil along the riverbank and dike west of the dock with the potential to impact the sediment remediation, and 6) prepare and re-grade the Columbia River riverbank and dike as needed for geotechnical stability required for the sediment remediation. Alcoa has completed the remedial actions required by this enforcement order.

5.9

On January 30, 2009, the Clark County Superior Court entered a Consent Decree between Ecology and Alcoa, which required Alcoa to implement a December 2008 Cleanup Action Plan (CAP) to address contamination identified in a September 2008 Remedial Investigation/Feasibility Study (RI/FS) for the Site. The 2008 CAP identified four Areas of Concern (AOCs) that required additional remedial actions including the PCB-Impacted Sediment Area, Dike Underground Storage Tanks, Soluble Oil Area, and Crowley Parcel. On July 11, 2011, the Court entered an Amended Consent Decree, which required Alcoa to perform the remedial actions defined in a Supplemental Cleanup Action Plan. The Port was not a signatory to the 2008 Consent Decree or 2011 Amended Consent Decree but was subsequently identified by Ecology as a PLP in 2020.

5.10

Alcoa conducted cleanup actions at the Site pursuant to the 2009 Consent Decree, 2008 Cleanup Action Plan, 2011 Amended Consent Decree, and 2011 Supplemental Cleanup Action Plan. The remedial action for the PCB-Impacted Sediment Area included two main elements: 1) dredging, dewatering, and disposal of PCB-impacted sediments; and 2) placement of clean sand material following dredging to enhance natural recovery, restore natural grade in-water elevations, and protect the shoreline at the Site (herein comprehensively referred to as enhanced natural recovery (ENR)).

5.11

Dredging was initiated on December 1, 2008, and continued through January 26, 2009. Approximately 50,000 cubic yards (cy) of PCB-impacted sediment was removed during dredging activities and 1.5 million gallons of dredged decant water was treated on-site prior to discharge. Approximately 4,910 cy of the total dredge volume was released into

the Columbia River when a shoreline slope failure occurred on January 5, 2009. The shoreline slope reconstruction occurred between February 24, 2009 and February 27, 2009. Following dredging actions, approximately 34,305 cy of ENR sand was placed in-water primarily using barge-mounted equipment. No confirmational samples of the post-dredged surface area were collected by Alcoa prior to placement of the ENR sand. Performance sediment sampling was conducted following placement of the ENR sand and shoreline armoring to demonstrate compliance with Site cleanup standards. The performance samples were collected at the standard point of compliance (POC) for sediment cleanups (0-10 centimeters (cm) of riverbed), which was within the 6-inch layer of clean ENR sand placed on top of the post-dredged surface areas. All the performance samples collected from the clean ENR sand layer verified those locations were below the Site-specific remediation level of 320 micrograms per kilogram (µg/kg) and the Site-specific surface area-weighted average concentration (SWAC) cleanup level of 97 micrograms per kilogram (µg/kg) as established in the 2008 CAP. Alcoa documented completion of the remedial action in the December 2009 *Project Completion Report: Alcoa/Evergreen Vancouver Site*.

5.12

In 2015 Ecology conducted the first Periodic Review of the Site and concluded, based on the availability of data at the time, that "the cleanup actions completed at the Alcoa Vancouver Site appear to be protective of human health and the environment". Ecology is in the process of conducting a second Periodic Review of the Site.

5.13

In 2018 the Port conducted sampling of sediments to incorporate Berth 17 into its existing maintenance dredging program within the former 2009 cleanup dredge area. The sediment samples analytical results showed exceedances of PCBs above Site-specific cleanup levels, remedial action levels, and PCBs and polycyclic aromatic hydrocarbons (PAHs) above Sediment Management Standards (SMS) Freshwater Screening Levels. In 2019 and 2021, the Port collected additional samples of sediment to understand sediment conditions relative to potential future operational use and to document surface and subsurface conditions prior to and after fender pile replacement. Consistent with the 2018, the results indicated that elevated concentrations of PCBs and PAHs are present in surface and subsurface within the berth area. The ENR sand layer placed in 2009 was not detected during the 2018, 2019, and 2021 in-water sediment sampling by the Port.

5.14

In 2021 and 2022 Alcoa conducted additional in-water sampling to support the second Period Review process as directed by Ecology. Results of this sampling showed PCB concentrations in sediment remain above Site-specific cleanup standards and remediation levels as well as PAHs exceeding SMS Freshwater Screening Levels.

6. Ecology Determinations

Ecology makes the following determinations, without any express or implied admissions of such determinations (and underlying facts) by the Subject PLP.

6.1

The Subject PLP is an "owner or operator" as defined in RCW 70A.305.020(22) of a "facility" as defined in RCW 70A.305.020(8).

6.2

Based upon all factors known to Ecology, a "release" or "threatened release" of "hazardous substance(s)" as defined in RCW 70A.305.020(32), (13), respectively, has occurred at the Site.

6.3

Based upon credible evidence, Ecology issued a PLP status letter to the Subject PLP dated July 9, 2020, pursuant to RCW 70A.305.040, .020(26), and WAC 173-340-500. After providing for notice and opportunity for comment, reviewing any comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued a determination that the Subject PLP is a PLP under RCW 70A.305.040 and notified the Subject PLP of this determination by letter dated August 20, 2020.

6.4

Pursuant to RCW 70A.305.030(1), .050(1), Ecology may require PLPs to investigate or conduct other remedial actions with respect to any release or threatened release of hazardous substances, whenever it believes such action to be in the public interest. Based on the foregoing facts, Ecology believes the remedial actions required by this Order are in the public interest.

6.5

Under WAC 173-340-430, an interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, remedial investigation/feasibility study, or design of a cleanup action plan.

PCB concentrations in sediment remain above Site-specific cleanup standards and remediation levels as established in the 2008 CAP. In-water sediment sampling conducted by the Port and Alcoa since the remedial action confirmed PCBs above cleanup levels remain in sediments at the Site (as well as elevated PAHs). Based on these circumstances, Ecology has determined that an interim action is warranted under WAC 173-340-430.

7. Work to be Performed

Based on the Findings of Fact and Ecology Determinations, it is hereby ordered that the Subject PLP take the following remedial actions at the Site. The area within the Site where remedial action is necessary under RCW 70A.305 is described in the Interim Action Area figure (Exhibit A). These remedial actions must be conducted in accordance with WAC 173-340 and 173-204:

7.1

The Subject PLP shall perform an interim action in accordance with the requirements of WAC 173-340-430. Within the interim action area, the Port will remove PCB and PAH contaminated sediment via dredging. The dredge extents will be defined following a pre-design investigation in accordance with the schedule and terms of the Scope of Work and Schedule (Exhibit C). The Interim Action will address sediment contamination and comply with the Site-specific PCB cleanup level and the SMS Sediment Cleanup Objectives for total Aroclor PCBs and total PAHs as described in the Interim Action Work Plan (IAWP) (Exhibit B) and the Engineering Design Report to be prepared following completion of the pre-design investigation. The Interim Action will be subject to review and approval by Ecology to ensure compliance with MTCA/SMS requirements and dredge material will be disposed of off-site at a licensed upland disposal facility.

7.2

If the Subject PLP learns of a significant change in conditions at the Site, including but not limited to a statistically significant increase in contaminant and/or chemical concentrations in any media, the Subject PLP, within seven (7) days of learning of the change in condition, shall notify Ecology in writing of said change and provide Ecology with any reports or records (including laboratory analyses, sampling results) relating to the change in conditions.

7.3

The Subject PLP shall submit to Ecology written monthly Progress Reports that describe the actions taken during the previous month to implement the requirements of this Order. All Progress Reports shall be submitted by the tenth (10th) day of the month in which they are due after the effective date of this Order. Unless otherwise specified by Ecology, Progress Reports and any other documents submitted pursuant to this Order shall be sent by certified mail, return receipt requested, to Ecology's project coordinator. The Progress Reports shall include the following:

7.3.1

A list of onsite activities that have taken place during the month.

7.3.2

Detailed description of any deviations from required tasks not otherwise documented in project plans or amendment requests.

7.3.3

Description of all deviations from the Schedule (Exhibit C) during the current month and any planned deviations in the upcoming month.

7.3.4

For any deviations in schedule, a plan for recovering lost time and maintaining compliance with the schedule.

7.3.5

All raw data (including laboratory analyses) received during the previous quarter (if not previously submitted to Ecology), together with a detailed description of the underlying samples collected.

7.3.6

A list of deliverables for the upcoming month.

7.4

Pursuant to WAC 173-340-440(11), the Subject PLP shall maintain sufficient and adequate financial assurance mechanisms to cover all costs associated with the operation and maintenance of the remedial action at the Site, including institutional controls, compliance monitoring, and corrective measures.

7.4.1

Within sixty (60) days of the effective date of this Order, the Subject PLP shall submit to Ecology for review and approval an estimate of the costs under this Order for operation and maintenance of the remedial actions at the Site, including institutional controls, compliance monitoring and corrective measures. Within sixty (60) days after Ecology approves the aforementioned cost estimate, the Subject PLP shall provide proof of financial assurances sufficient to cover all such costs in a form acceptable to Ecology.

7.4.2

The Subject PLP shall adjust the financial assurance coverage and provide Ecology's project coordinator with documentation of the updated financial assurance for:

7.4.2.1

Inflation, annually, within thirty (30) days of the anniversary date of the entry of this Order; or if applicable, the modified anniversary date established in accordance with this section, or if applicable, ninety (90) days after the close of the Subject PLP's fiscal year if the financial test or corporate guarantee is used.

7.4.2.2

Changes in cost estimates, within thirty (30) days of issuance of Ecology's approval of a modification or revision to the IAWP that result in increases to the cost or expected duration of remedial actions. Any adjustments for inflation since the most recent preceding anniversary date shall be made concurrent with adjustments for changes in cost estimates. The issuance of Ecology's approval of a revised or modified IAWP will revise the anniversary date established under this section to become the date of issuance of such revised or modified IAWP.

7.5

If required by the IAWP, institutional controls will be implemented at the Site. Environmental (Restrictive) Covenants may be used to implement the institutional controls of the interim action area, that do not have a Clark County assigned parcel number.

7.5.1

In consultation with the Subject PLP, Ecology will prepare the Environmental (Restrictive) Covenants consistent with WAC 173-340-440, RCW 64.70, and any policies or procedures specified by Ecology. The Environmental (Restrictive) Covenants shall restrict future activities and uses of the Site as agreed to by Ecology and the Subject PLP.

7.5.2

After approval by Ecology, the Subject PLP shall record the Environmental (Restrictive) Covenant for affected properties it owns with the office of the Clark County Auditor as detailed in the Schedule (Exhibit C). The Subject PLP shall provide Ecology with the original recorded Environmental (Restrictive) Covenants within thirty (30) days of the recording date.

7.5.3

As detailed in the IAWP, as part of the remedial action for the Site, institutional controls are required on properties not owned by the Subject PLP. The Subject PLP will ensure that the owner of each affected property records an Ecology-approved Environmental (Restrictive) Covenant as detailed in the Schedule (Exhibit C). Upon a showing that the Subject PLP has made a good faith effort to secure an Environmental (Restrictive) Covenant for an affected property and failed to do so, Ecology may provide assistance to the Subject PLP. Unless Ecology determines otherwise, affected properties with Clark County Property Account numbers: 500501000; 500505000; 503000000; 503001000; and 503020000. The Subject PLP shall provide Ecology with the original recorded Environmental (Restrictive) Covenants within thirty (30) days of the recording date.

7.6

All plans or other deliverables submitted by the Subject PLP for Ecology's review and approval under the Schedule (Exhibit C) shall, upon Ecology's approval, become integral and enforceable parts of this Order. The Subject PLP shall take any action required by such deliverable.

7.7

Any Party may propose an additional interim action under this Order. If the Parties are in agreement concerning the additional interim action, the Subject PLP shall prepare and submit to Ecology an IAWP for that additional interim action, including a scope of work and schedule, by the date determined by Ecology. Ecology will provide public notice and opportunity to comment on the IAWP Plan in accordance with WAC 173-340-600(16). The Subject PLP shall not conduct the interim action until Ecology approves the IAWP. Upon approval by Ecology, the IAWP becomes an integral and enforceable part of this Order, and Subject PLP is required to conduct the interim action in accordance with the approved IAWP. Ecology reserves its authority to require additional interim action(s) under a separate order or other enforcement action under RCW 70A.305, or to undertake the interim action(s) itself.

7.8

If Ecology determines that the Subject PLP has failed to make sufficient progress or failed to implement the remedial action, in whole or in part, Ecology may, after notice to the Subject PLP, perform any or all portions of the remedial action or at Ecology's discretion allow the Subject PLP opportunity to correct. In an emergency, Ecology is not required to provide notice to the Subject PLP, or an opportunity for dispute resolution. The Subject PLP shall reimburse Ecology for the costs of doing such work in accordance with Section VIII.A (Payment of Remedial Action Costs). Ecology reserves the right to enforce requirements of this Order under Section 10 (Enforcement).

7.9

Except where necessary to abate an emergency situation or where required by law, the Subject PLP shall not perform any remedial actions at the Site outside those remedial actions required by this Order to address the contamination that is the subject of this Order, unless Ecology concurs, in writing, with such additional remedial actions pursuant to Section 8.11 (Amendment of Order). In the event of an emergency, or where actions are taken as required by law, the Subject PLP must notify Ecology in writing of the event and remedial action(s) planned or taken as soon as practical but no later than within twenty-four (24) hours of the discovery of the event.

7.10

Ecology hereby incorporates into this Order the previous remedial actions described in Section 5 (Findings of Fact). Reimbursement for specific project tasks under a grant agreement with Ecology is contingent upon a determination by Ecology's Toxics Cleanup Program that the retroactive costs are eligible under WAC 173-332A-320(6), the work performed complies with the substantive requirements of WAC 173-340, and the work is consistent with the remedial actions required under this Order. The costs associated with Ecology's determination on the past independent remedial actions described in Section 5 (Findings of Fact), are recoverable under this Order.

8. Terms and Conditions

8.1 Payment of Remedial Action Costs

The Subject PLP shall pay to Ecology costs incurred by Ecology pursuant to this Order and consistent with WAC 173-340-550(2). These costs shall include work performed by Ecology or its contractors for, or on, the Site under RCW 70A.305, including remedial actions and Order preparation, negotiation, oversight, and administration. These costs shall include work performed both prior to and subsequent to the issuance of this Order. Ecology's costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173 340 550(2). For costs incurred before this date, Ecology will send the Subject PLP an invoice soon after the Order is signed. For costs incurred after this date, Ecology will send the Subject PLP an invoice quarterly. For all Ecology costs incurred, Subject PLP shall pay the required amount within thirty (30) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general statement of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Pursuant to WAC 173-340-550(4), failure to pay Ecology's costs within ninety (90) days of receipt of the itemized statement of costs will result in interest charges at the rate of twelve percent (12%) per annum, compounded monthly.

In addition to other available relief, pursuant to RCW 19.16.500, Ecology may utilize a collection agency and/or, pursuant to RCW 70A.305.060, file a lien against real property subject to the remedial actions to recover unreimbursed remedial action costs.

8.2 Designated Project Coordinators

The project coordinator for Ecology is:

Dave Johnson
Department of Ecology
Solid Waste Management Program, Industrial Section

P.O. Box 47600
Olympia, WA 98504
360-338-2638
E-mail: johd461@ecy.wa.gov

The project coordinator for the Subject PLP is:

Mary Mattix
3103 NW Lower River Road
Vancouver, WA 98660
360-823-5316
E-mail:mmattix@portvanusa.com

Each project coordinator shall be responsible for overseeing the implementation of this Order. Ecology's project coordinator will be Ecology's designated representative for the Site. To the maximum extent possible, communications between Ecology and the Subject PLP, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order shall be directed through the project coordinators. The project coordinators may designate, in writing, working level staff contacts for all or portions of the implementation of the work to be performed required by this Order.

Any Party may change its respective project coordinator. Written notification shall be given to the other Party at least ten (10) calendar days prior to the change.

8.3 Performance

All geologic and hydrogeologic work performed pursuant to this Order shall be under the supervision and direction of a geologist or hydrogeologist licensed by the State of Washington or under the direct supervision of an engineer registered by the State of Washington, except as otherwise provided for by RCW 18.43 and 18.220.

All engineering work performed pursuant to this Order shall be under the direct supervision of a professional engineer registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

All construction work performed pursuant to this Order shall be under the direct supervision of a professional engineer or a qualified technician under the direct supervision of a professional engineer. The professional engineer must be registered by the State of Washington, except as otherwise provided for by RCW 18.43.130.

Any documents submitted containing geologic, hydrogeologic, or engineering work shall be under the seal of an appropriately licensed professional as required by RCW 18.43 and 18.220.

The Subject PLP shall notify Ecology in writing of the identity of any engineer(s) and geologist(s), contractor(s), subcontractor(s), and other key personnel to be used in carrying out the terms of this Order, in advance of their involvement at the Site.

8.4 Access

Ecology or any Ecology authorized representative shall have access to enter and freely move about all property at the Site that the Subject PLP either owns, controls, or has access rights to at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the Subject PLP's progress in carrying out the terms of this Order; conducting such tests or collecting such samples as Ecology may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by the Subject PLP. Ecology or any Ecology authorized representative shall give reasonable notice before entering any Site property owned or controlled by the Subject PLP unless an emergency prevents such notice. All persons who access the Site pursuant to this section shall comply with any applicable health and safety plan(s). Ecology employees and their representatives shall not be required to sign any liability release or waiver as a condition of Site property access.

The Subject PLP shall make best efforts to secure access rights for those properties within the Site not owned or controlled by the Subject PLP where remedial activities or investigations will be performed pursuant to this Order. As used in this Section, "best efforts" means the efforts that a reasonable person in the position of the Subject PLP would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements, as required by this Section. If the Subject PLP is unable to accomplish what is required through "best efforts," they shall notify Ecology, and include a description of the steps taken to comply with the requirements. If Ecology deems it appropriate, it may assist the Subject PLP, or take independent action, in obtaining such access and/or use restrictions. Ecology reserves the right to seek payment from the Subject PLP for all costs, including cost of attorneys' time, incurred by Ecology in obtaining such access or agreements to restrict land, water, or other resource use.

8.5 Sampling, Data Submittal, and Availability

With respect to the implementation of this Order, the Subject PLP shall make the results of all sampling, laboratory reports, and/or test results generated by it or on its behalf available to Ecology. Pursuant to WAC 173-340-840(5), all sampling data shall be submitted to Ecology in both printed and electronic formats in accordance with Section VII (Work to be Performed), Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements), and/or any subsequent procedures specified by Ecology for data submittal.

If requested by Ecology, the Subject PLP shall allow Ecology and/or its authorized representative to take split or duplicate samples of any samples collected by the Subject PLP pursuant to implementation of this Order. The Subject PLP shall notify Ecology seven (7) days in advance of any sample collection or work activity at the Site. Ecology shall, upon request, allow the Subject PLP and/or its authorized representative to take split or duplicate samples of any samples collected by Ecology pursuant to the implementation of this Order, provided that doing so does not interfere with Ecology's sampling. Without limitation on Ecology's rights under Section 8.4 (Access), Ecology shall notify the Subject PLP prior to any sample collection activity unless an emergency prevents such notice.

In accordance with WAC 173-340-830(2)(a), all hazardous substance analyses shall be conducted by a laboratory accredited under WAC 173-50 for the specific analyses to be conducted, unless otherwise approved by Ecology.

8.6 Public Participation

Ecology shall maintain the responsibility for public participation at the Site. However, the Subject PLP shall cooperate with Ecology, and shall:

8.6.1

If agreed to by Ecology, develop appropriate mailing lists and prepare drafts of public notices and fact sheets at important stages of the remedial action, such as the submission of work plans, remedial investigation/feasibility study reports, cleanup action plans, and engineering design reports. As appropriate, Ecology will edit, finalize, and distribute such fact sheets and prepare and distribute public notices of Ecology's presentations and meetings.

8.6.2

Notify Ecology's project coordinator prior to the preparation of all press releases and fact sheets, and before meetings related to remedial action work to be performed at the Site with the interested public and/or local governments. Likewise, Ecology shall notify the Subject PLP prior to the issuance of all press releases and fact sheets related to the Site, and before meetings related to the Site with the interested public and local governments. For all press releases, fact sheets, meetings, and other outreach efforts by the Subject PLP that do not receive prior Ecology approval, the Subject PLP shall clearly indicate to its audience that the press release, fact sheet, meeting, or other outreach effort was not sponsored or endorsed by Ecology.

8.6.3

When requested by Ecology, participate in public presentations on the progress of the remedial action at the Site. Participation may be through attendance at public meetings to assist in answering questions or as a presenter.

8.6.4

When requested by Ecology, arrange and maintain a repository to be located at:

Fort Vancouver Regional Library
1007 E. Mill Plain Blvd.
Vancouver, WA 98663

At a minimum, copies of all public notices, fact sheets, and documents relating to public comment periods shall be promptly placed in these repositories. A copy of all documents related to this Site shall be maintained in the repository at Ecology's Solid Waste Management Program in Lacey, Washington.

8.7 Access to Information

The Subject PLP shall provide to Ecology, upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within the Subject PLP's possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the work. The Subject PLP shall also make available to Ecology, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the work.

Nothing in this Order is intended to waive any right the Subject PLP may have under applicable law to limit disclosure of Records protected by the attorney work-product privilege and/or the attorney-client privilege. If the Subject PLP withholds any requested Records based on an assertion of privilege, the Subject PLP shall provide Ecology with a privilege log specifying the Records withheld and the applicable privilege. No Site-related data collected pursuant to this Order shall be considered privileged, including: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, biological, or engineering data, or the portion of any other record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondents are required to create or generate pursuant to this Order.

Notwithstanding any provision of this Order, Ecology retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under any other applicable statutes or regulations.

8.8 Retention of Records

During the pendency of this Order, and for ten (10) years from the date of completion of the work performed pursuant to this Order, the Subject PLP shall preserve all records,

reports, documents, and underlying data in its possession relevant to the implementation of this Order and shall insert a similar record retention requirement into all contracts with project contractors and subcontractors.

8.9 Resolution of Disputes

8.9.1

In the event that the Subject PLP elects to invoke dispute resolution the Subject PLP must utilize the procedure set forth below.

8.9.1.1 Upon the triggering event (receipt of Ecology's project coordinator's written decision or an itemized billing statement), the Subject PLP has fourteen (14) calendar days within which to notify Ecology's project coordinator in writing of its dispute (Informal Dispute Notice).

8.9.1.2 The Parties' project coordinators shall then confer in an effort to resolve the dispute informally. The Parties shall informally confer for up to fourteen (14) calendar days from receipt of the Informal Dispute Notice. If the project coordinators cannot resolve the dispute within those fourteen (14) calendar days, then within seven (7) calendar days Ecology's project coordinator shall issue a written decision (Informal Dispute Decision) stating: the nature of the dispute; the Subject PLP's position with regards to the dispute; Ecology's position with regards to the dispute; and the extent of resolution reached by informal discussion.

8.9.1.3 The Subject PLP may then request management review of the dispute. The Subject PLP must submit this request (Formal Dispute Notice) in writing to the Solid Waste Management Program, Industrial Section Manager within seven (7) calendar days of receipt of Ecology's Informal Dispute Decision. The Formal Dispute Notice shall include a written statement of dispute setting forth: the nature of the dispute; the Subject PLP's position with respect to the dispute; and the information relied upon to support its position.

8.9.1.4 The Section Manager shall conduct a review of the dispute and shall endeavor to issue a written decision regarding the dispute (Decision on Dispute) within thirty (30) calendar days of receipt of the Formal Dispute Notice. The Decision on Dispute shall be Ecology's final decision on the disputed matter.

8.9.2

The Parties agree to only utilize the dispute resolution process in good faith and agree to expedite, to the extent possible, the dispute resolution process whenever it is used.

8.9.3

Implementation of these dispute resolution procedures shall not provide a basis for delay of any activities required in this Order, unless Ecology agrees in writing to a schedule extension.

8.9.4

In case of a dispute, failure to either proceed with the work required by this Order or timely invoke dispute resolution may result in Ecology's determination that insufficient progress is being made in preparation of a deliverable, and may result in Ecology undertaking the work under Section 7.1 (Work to be Performed) or initiating enforcement under Section 10 (Enforcement).

8.10 Extension of Schedule

8.10.1

The Subject PLP's request for an extension of schedule shall be granted only when a request for an extension is submitted in a timely fashion, generally at least thirty (30) days prior to expiration of the deadline for which the extension is requested, and good cause exists for granting the extension. All extensions shall be requested in writing. The request shall specify:

8.10.1.1 The deadline that is sought to be extended.

8.10.1.2 The length of the extension sought.

8.10.1.3 The reason(s) for the extension.

8.10.1.4 Any related deadline or schedule that would be affected if the extension were granted.

8.10.2

The burden shall be on the Subject PLP to demonstrate to the satisfaction of Ecology that the request for such extension has been submitted in a timely fashion and that good cause exists for granting the extension. Good cause may include, but may not be limited to:

8.10.2.1 Circumstances beyond the reasonable control and despite the due diligence of the Subject PLP including delays caused by unrelated third parties or Ecology, such as (but not limited to) delays by Ecology in

reviewing, approving, or modifying documents submitted by the Subject PLP.

8.10.2.2 A shelter in place or work stoppage mandated by state or local government order due to public health and safety emergencies.

8.10.2.3 Acts of God, including fire, flood, blizzard, extreme temperatures, storm, or other unavoidable casualty.

8.10.2.4 Endangerment as described in Section 8.12 (Endangerment).

However, neither increased costs of performance of the terms of this Order nor changed economic circumstances shall be considered circumstances beyond the reasonable control of the Subject PLP.

8.10.3

Ecology shall act upon any Subject PLP's written request for extension in a timely fashion. Ecology shall give the Subject PLP written notification of any extensions granted pursuant to this Order. A requested extension shall not be effective until approved by Ecology. Unless the extension is a substantial change, it shall not be necessary to amend this Order pursuant to Section 8.11 (Amendment of Order) when a schedule extension is granted.

8.10.4

At the Subject PLP's request, an extension shall only be granted for such period of time as Ecology determines is reasonable under the circumstances. Ecology may grant schedule extensions exceeding ninety (90) days only as a result of one of the following:

8.10.4.1 Delays in the issuance of a necessary permit which was applied for in a timely manner.

8.10.4.2 Other circumstances deemed exceptional or extraordinary by Ecology.

8.10.4.3 Endangerment as described in Section 8.12 (Endangerment).

8.11 Amendment of Order

The project coordinators may verbally agree to minor changes to the work to be performed without formally amending this Order. Minor changes will be documented in writing by Ecology within seven (7) days of verbal agreement.

Except as provided in Section 8.13 (Reservation of Rights), substantial changes to the work to be performed shall require formal amendment of this Order. This Order may only be formally amended by the written consent of both Ecology and the Subject PLP.

Ecology will provide its written consent to a formal amendment only after public notice and opportunity to comment on the formal amendment.

When requesting a change to the Order, the Subject PLP shall submit a written request to Ecology for approval. Ecology shall indicate its approval or disapproval in writing and in a timely manner after the written request is received. If Ecology determines that the change is substantial, then the Order must be formally amended. Reasons for the disapproval of a proposed change to this Order shall be stated in writing. If Ecology does not agree to a proposed change, the disagreement may be addressed through the dispute resolution procedures described in Section 8.9 (Resolution of Disputes).

8.12 Endangerment

In the event Ecology determines that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment on or surrounding the Site, Ecology may direct the Subject PLP to cease such activities for such period of time as it deems necessary to abate the danger. The Subject PLP shall immediately comply with such direction.

In the event the Subject PLP determines that any activity being performed at the Site under this Order is creating or has the potential to create a danger to human health or the environment, the Subject PLP may cease such activities. The Subject PLP shall notify Ecology's project coordinator as soon as possible, but no later than twenty-four (24) hours after making such determination or ceasing such activities. Upon Ecology's direction, the Subject PLP shall provide Ecology with documentation of the basis for the determination or cessation of such activities. If Ecology disagrees with the Subject PLP's cessation of activities, it may direct the Subject PLP to resume such activities.

If Ecology concurs with or orders a work stoppage pursuant to this section, the Subject PLP's obligations with respect to the ceased activities shall be suspended until Ecology determines the danger is abated, and the time for performance of such activities, as well as the time for any other work dependent upon such activities, shall be extended in accordance with Section 8.10 (Extension of Schedule) for such period of time as Ecology determines is reasonable under the circumstances.

Nothing in this Order shall limit the authority of Ecology, its employees, agents, or contractors to take or require appropriate action in the event of an emergency.

8.13 Reservation of Rights

This Order is not a settlement under RCW 70A.305. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any of Ecology's rights or authority. Ecology will not, however, bring an action against the Subject PLP to recover remedial action costs paid to and received by Ecology under this Order. In addition, Ecology will not take additional enforcement actions against the Subject PLP regarding

remedial actions required by this Order, provided the Subject PLP complies with this Order.

Ecology nevertheless reserves its rights under RCW70A.305, including the right to require additional or different remedial actions at the Site should it deem such actions necessary to protect human health or the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Site.

By entering into this Order, the Subject PLP does not admit to any liability for the Site. Although the Subject PLP is committing to conducting the work required by this Order under the terms of this Order, the Subject PLP expressly reserves all rights available under law, including but not limited to the right to seek cost recovery or contribution against third parties, and the right to assert any defenses to liability in the event of enforcement.

8.14 Transfer of Interest in Property

No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by the Subject PLP without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to the Subject PLP's transfer of any interest in all or any portion of the Site, and during the effective period of this Order, the Subject PLP shall provide a copy of this Order to any prospective purchaser, lessee, transferee, assignee, or other successor in said interest; and, at least thirty (30) days prior to any transfer, the Subject PLP shall notify Ecology of said transfer. Upon transfer of any interest, the Subject PLP shall notify all transferees of the restrictions on the activities and uses of the property under this Order and incorporate any such use restrictions into the transfer documents.

8.15 Compliance with Applicable Laws

Ecology makes the final determination on whether applicable permit or substantive requirements are "legally applicable" or "relevant and appropriate" under WAC 173-340-710(2).

8.15.1 Applicable Laws

All actions carried out by the Subject PLP pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits or approvals, except as provided in RCW 70A.305.090. The permits or specific federal, state, or local requirements that the agency has determined are applicable and that are known at the time of the execution of this Order have been identified in Exhibit B. The Subject PLP has

a continuing obligation to identify additional applicable federal, state, and local requirements which apply to actions carried out pursuant to this Order, and to comply with those requirements. As additional federal, state, and local requirements are identified by Ecology or the Subject PLP, Ecology will document in writing if they are applicable to actions carried out pursuant to this Order, and the Subject PLP must implement those requirements.

8.15.2 Relevant and Appropriate Requirements.

All actions carried out by the Subject PLP pursuant to this Order shall be done in accordance with relevant and appropriate requirements identified by Ecology. The relevant and appropriate requirements that Ecology has determined apply have been identified in Exhibit B. If additional relevant and appropriate requirements are identified by Ecology or the Subject PLP, Ecology will document in writing if they are applicable to actions carried out pursuant to this Order and the Subject PLP must implement those requirements.

8.15.3

Pursuant to RCW 70A.305.090(1), the Subject PLP may be exempt from the procedural requirements of RCW 70A.15, 70A.205, 70A.300, 77.55, 90.48, and 90.58 and of any laws requiring or authorizing local government permits or approvals. However, the Subject PLP shall comply with the substantive requirements of such permits or approvals. For permits and approvals covered under RCW 70A.305.090(1) that have been issued by local government, the Parties agree that Ecology has the non-exclusive ability under this Order to enforce those local government permits and/or approvals. The exempt permits or approvals and the applicable substantive requirements of those permits or approvals, as they are known at the time of the execution of this Order, have been identified in Exhibit B.

8.15.4

The Subject PLP has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70A.305.090(1) would otherwise be required for the remedial action under this Order. In the event either Ecology or the Subject PLP determines that additional permits or approvals addressed in RCW 70A.305.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify the other Party of its determination. Ecology shall determine whether Ecology or the Subject PLP shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, the Subject PLP shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional

substantive requirements that must be met by the Subject PLP and on how the Subject PLP must meet those requirements. Ecology shall inform the Subject PLP in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. The Subject PLP shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Pursuant to RCW 70A.305.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70A.305.090(1) would result in the loss of approval from a federal agency that is necessary for the state to administer any federal law, the exemption shall not apply and the Subject PLP shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70A.305.090(1), including any requirements to obtain permits or approvals.

8.16 Indemnification

To the extent permitted by law, the Subject PLP agrees to indemnify and save and hold the State of Washington, its employees, and agents harmless from any and all claims or causes of action (1) for death or injuries to persons, or (2) for loss or damage to property, to the extent arising from or on account of acts or omissions of the Subject PLP, its officers, employees, agents, or contractors in entering into and implementing this Order. However, the Subject PLP shall not indemnify the State of Washington nor save nor hold its employees and agents harmless from any claims or causes of action to the extent arising out of the negligent acts or omissions of the State of Washington, or the employees or agents of the State, in entering into or implementing this Order.

9. Satisfaction of Order

The provisions of this Order shall be deemed satisfied upon the Subject PLP's receipt of written notification from Ecology that the Subject PLP has completed the remedial activity required by this Order, as amended by any modifications, and that the Subject PLP has complied with all other provisions of this Agreed Order.

10. Enforcement

Pursuant to RCW 70A.305.050, this Order may be enforced as follows:

10.1

The Attorney General may bring an action to enforce this Order in a state or federal court.

10.2

The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

10.3

A liable party who refuses, without sufficient cause, to comply with any term of this Order will be liable for:

10.3.1

Up to three (3) times the amount of any costs incurred by the State of Washington as a result of its refusal to comply.

10.3.2

Civil penalties of up to twenty-five thousand dollars ($25,000) per day for each day it refuses to comply.

10.4

This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under RCW 70A.305.070.

Effective date of this Order: _____

Port of Vancouver

_____

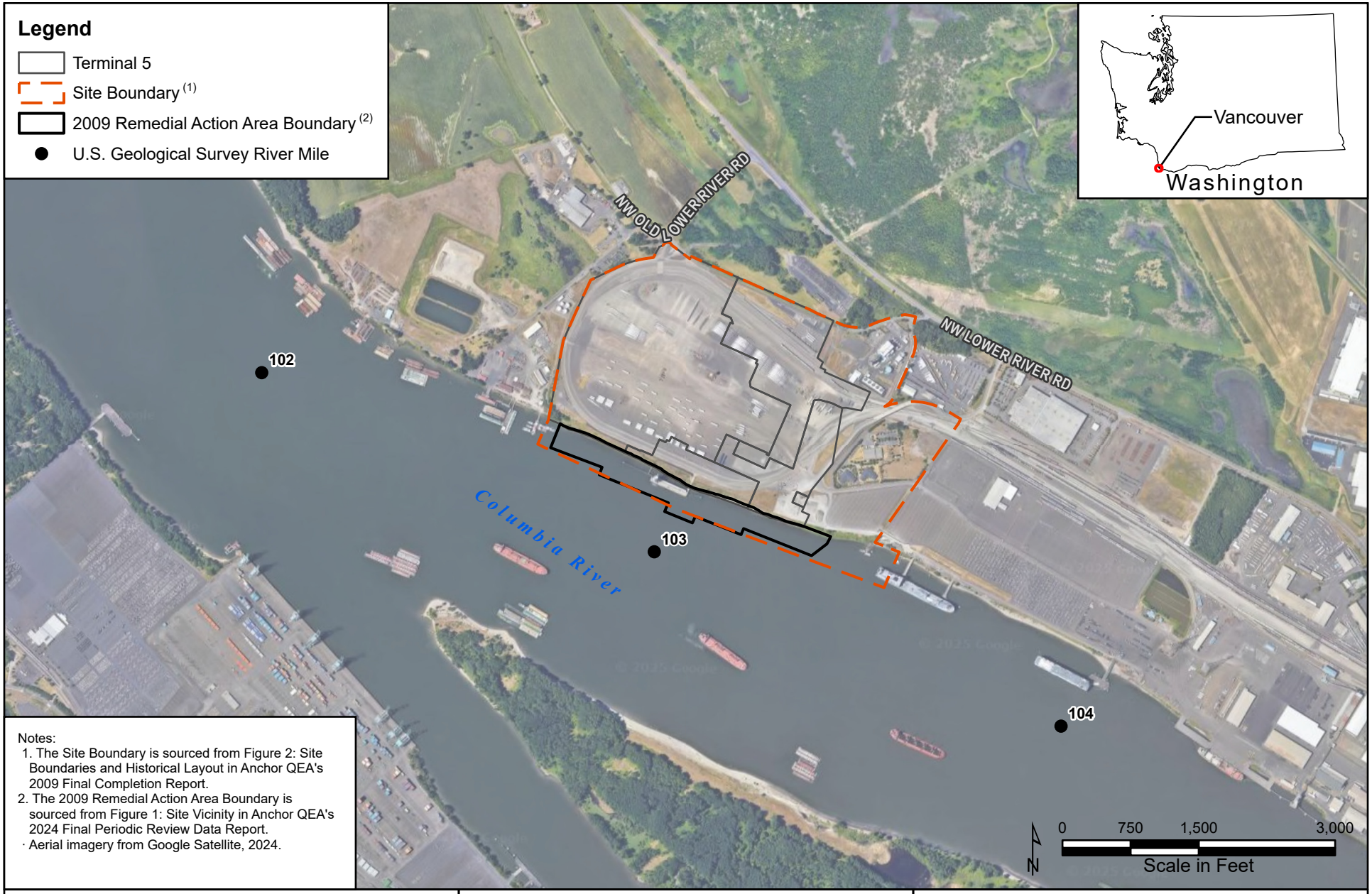
Mary Mattix
Director of Environmental Services
360-823-5316

State of Washington
Department of Ecology

_____

James DeMay
Industrial Section, Section Manager
Solid Waste Management Program
(360) 407-6868

EXHIBIT A



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Interim Action Work Plan
Port of Vancouver
Alcoa Vancouver Site
Vancouver, Washington

Figure 1
Vicinity Map

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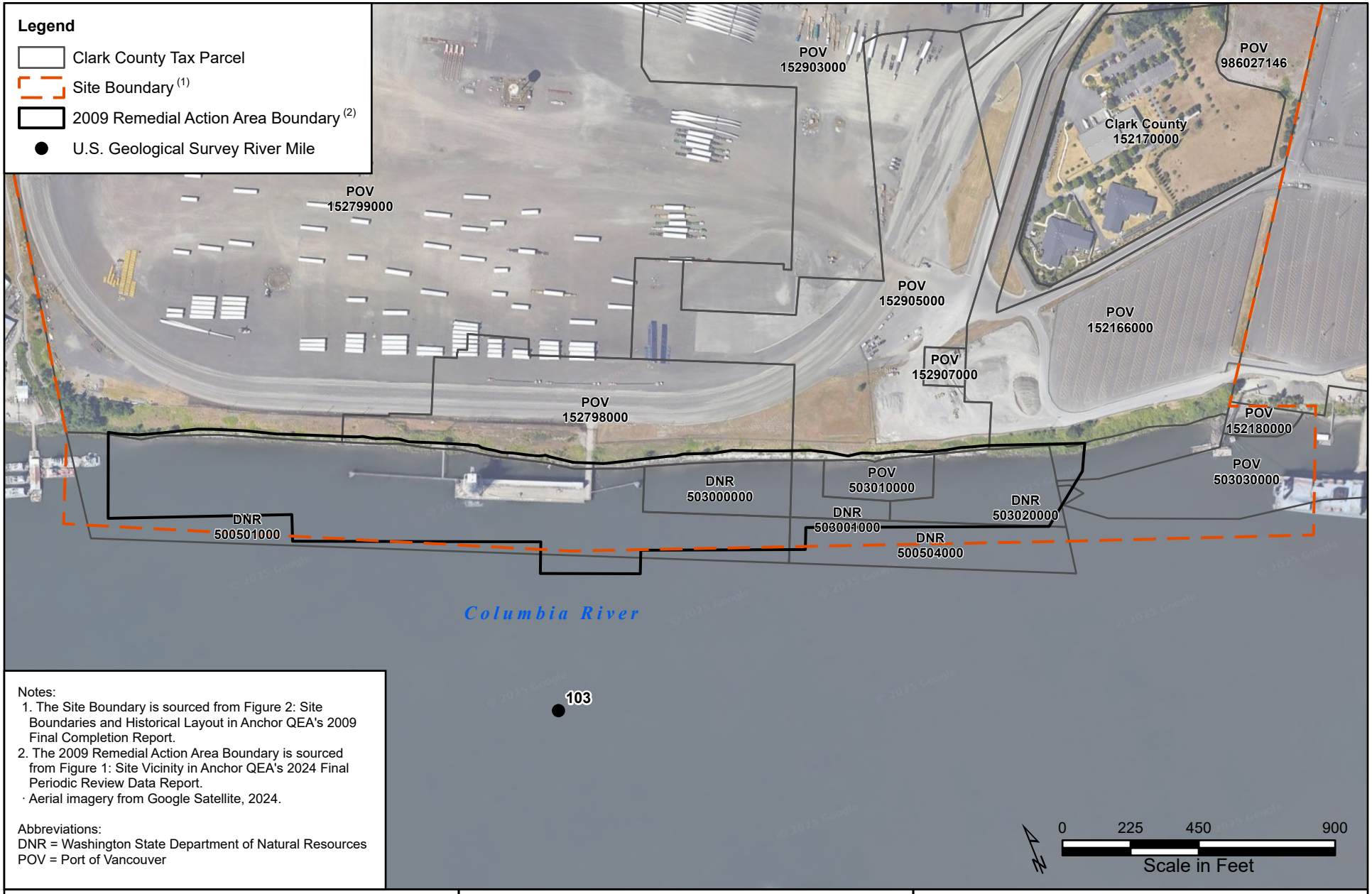
3/14/2025



Notes:
1. The Site Boundary is sourced from Figure 2: Site Boundaries and Historical Layout in Anchor QEA's 2009 Final Completion Report.
2. The 2009 Remedial Action Area Boundary is sourced from Figure 1: Site Vicinity in Anchor QEA's 2024 Final Periodic Review Data Report.
· Aerial imagery from Google Satellite, 2024.

Abbreviations:
DNR = Washington State Department of Natural Resources
POV = Port of Vancouver

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Interim Action Work Plan
Port of Vancouver
Alcoa Vancouver Site
Vancouver, Washington

Figure 2
Site Parcel Ownership

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3/21/2025

Legend

- Approximate Area Interim Action Dredging (2)
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Existing Structures
- 5-foot Bathymetry Contour (CRD)

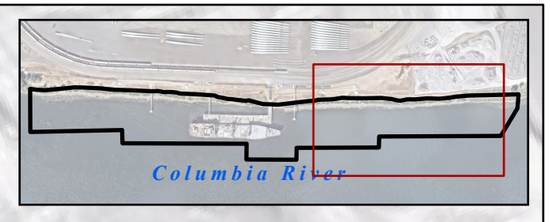
Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

- >700
- >110-700
- >97-110
- ≤ 97

Notes:
1. Interpolated surface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCBs results from sediment grab samples (0–10 centimeters below mudline) and core sample results from the 0–0.5 feet below mudline interval. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. Extent of dredging (and individual dredge units) will be defined after the pre-design investigation and final design.
   · Bathymetry contours created from 2022 Conditions Survey.
   · Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CRD = Columbia River Datum
µg/kg = Micrograms per kilogram
PCB = Polychlorinated biphenyl

0 40 80 160
Scale in Feet



MATCH LINE

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Interim Action
Alcoa Vancouver Site
Vancouver, Washington

Figure 3
Approximate Area of Interim Action Dredging

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3/24/2025

Legend

- Approximate Area Interim Action Dredging (2)
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Existing Structures
- 5-foot Bathymetry Contour (CRD)

Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

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Abbreviations:
CRD = Columbia River Datum
µg/kg = Micrograms per kilogram
PCB = Polychlorinated biphenyl

0 40 80 160
Scale in Feet

Columbia River

MATCH LINE

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Interim Action
Alcoa Vancouver Site
Vancouver, Washington

Figure 4
Approximate Area of Interim Action Dredging

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3/24/2025

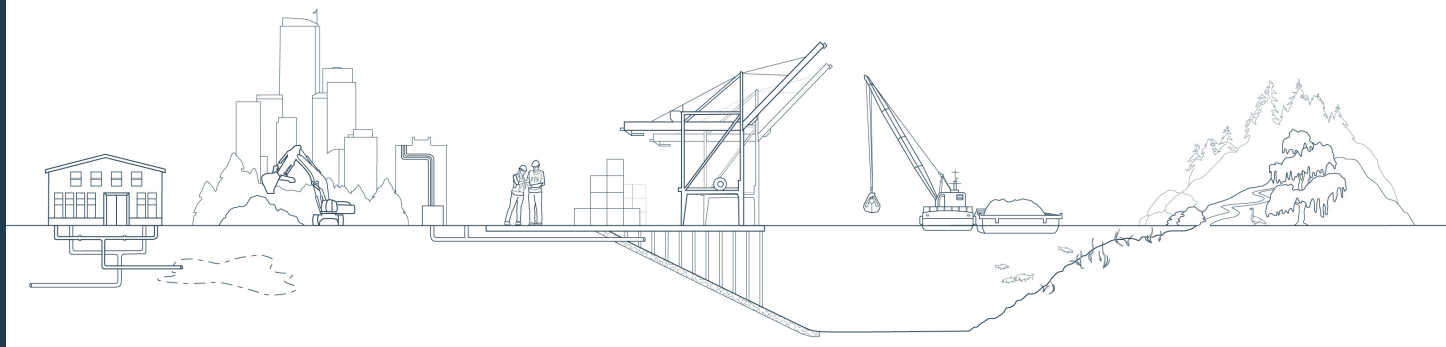
EXHIBIT B

Interim Action Work Plan

Port of Vancouver
Terminal 5 Alcoa Vancouver Site

Prepared for
Port of Vancouver

May 2025



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Certified B Corporation

LIMITATIONS

This report has been prepared for the exclusive use of Port of Vancouver, their authorized agents, and regulatory agencies. It has been prepared following the described methods and information available at the time of the work. No other party should use this report for any purpose other than that originally intended, unless Floyd|Snider agrees in advance to such reliance in writing. The information contained herein should not be utilized for any purpose or project except the one originally intended. Under no circumstances shall this document be altered, updated, or revised without written authorization of Floyd|Snider.

Table of Contents

1.0 Introduction 1-1
1.1 PURPOSE OF THE INTERIM ACTION WORK PLAN 1-2
1.2 DOCUMENT ORGANIZATION 1-2
2.0 Background 2-1
2.1 SITE HISTORY 2-1
2.2 SITE FEATURES AND SITE USE 2-2
2.3 FORMER ALCOA VANCOUVER SITE—2008 TO 2009 INVESTIGATION AND CLEANUP ACTION 2-3
2.3.1 Overview of Sediment Cleanup Standards 2-3
2.3.2 Feasibility Study and Selected Remedial Alternative 2-4
2.3.3 Description of the 2009 Sediment Cleanup Action 2-5
2.4 PORT OF VANCOUVER BERTH 17 SEDIMENT SAMPLING 2-6
2.5 CURRENT ECOLOGY PERIODIC REVIEW 2-6
2.5.1 Summary of 2021 and 2022 Periodic Review Sediment Sampling 2-7
2.6 NATURE AND EXTENT OF CONTAMINATION 2-7
2.6.1 Total Polychlorinated Biphenyl Aroclors 2-8
2.6.2 Polychlorinated Biphenyl Congeners 2-8
2.6.3 Total Polycyclic Aromatic Hydrocarbons 2-9
3.0 Conceptual Site Model 3-1
3.1 PHYSICAL AND HABITAT FEATURES 3-1
3.2 SOURCES 3-1
3.3 FATE AND TRANSPORT 3-1
3.4 RECEPTORS AND EXPOSURE PATHWAYS 3-2
4.0 Project Team and Responsibilities 4-1
4.1 KEY ORGANIZATIONS AND ROLES 4-1
5.0 Proposed Sediment Interim Action 5-1
6.0 Pre-Design Investigation 6-1
6.1 SURFACE GRAB SEDIMENT SAMPLING 6-2
6.2 SEDIMENT CORE SAMPLING 6-2
6.3 BULK SEDIMENT AND WATER TREATABILITY TESTING 6-3

6.4 BATHYMETRIC SURVEY 6-3
7.0 Permitting and Applicable or Relevant and Appropriate Requirements 7-1
7.1 STATE ENVIRONMENTAL POLICY ACT REQUIREMENTS 7-1
7.2 APPLICABLE FEDERAL, STATE, AND LOCAL PERMIT REQUIREMENTS 7-1
8.0 Schedule and Reporting 8-1
8.1 PRE-DESIGN INVESTIGATION SCHEDULE 8-1
8.2 REPORTING 8-1
9.0 References 9-1

List of Tables

Table 2.1 Interim Action Sediment Cleanup Standards (embedded)
Table 2.2 2018 to 2022 Site Sediment Total PCBs, Total PAH Results, and PCB Congener Data
Table 6.1 Data Quality Objectives
Table 6.2 Proposed PDI Sampling Locations

List of Figures

Figure 1.1 Vicinity Map
Figure 2.1 Site Parcel Ownership
Figure 6.1a and b Current Data and Surface Total PCBs Interpolation with Proposed PDI Sampling Locations
Figure 6.2a and b Current Data and 0.5–2.0 Feet bml Subsurface Total PCBs Interpolation with Proposed PDI Sampling Locations
Figure 6.3a and b Current Data and 2.0–4.0 Feet bml Subsurface Total PCBs Interpolation with Proposed PDI Sampling Locations

List of Appendices

Appendix A Field Sampling Plan
Appendix B Quality Assurance Project Plan
Appendix C Health and Safety Plan
Appendix D State Environmental Policy Act Checklist
Appendix E Inadvertent Discovery Plan
Appendix F 2009 to 2020 Bathymetric Comparison of Terminal 5 Sediments

List of Abbreviations

Abbreviation	Definition
ARAR	Applicable or Relevant and Appropriate Requirements
AO	Agreed Order
BMP	Best management practice
bml	Below mudline
CAP	Cleanup Action Plan
CPU	Clark County Public Utilities
CUL	Cleanup level
CY	Cubic yards
DNR	Washington State Department of Natural Resources
DQO	Data quality objective
DRET	Dredging elutriate test
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
EIM	Environmental Information Management
ENR	Enhanced natural recovery
FSP	Field Sampling Plan
IAWP	Interim Action Work Plan
IDP	Inadvertent Discovery Plan
IDW	Inverse distance weighting
LDW	Lower Duwamish Waterway
µg/kg	Micrograms per kilogram
MTCA	Model Toxics Control Act
NWP	Nationwide Permit
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PDI	Pre-Design Investigation
POC	Points of compliance
Port	Port of Vancouver

Abbreviation	Definition
QAPP	Quality Assurance Project Plan
RAL	Remedial Action Level
RI/FS	Remedial Investigation/Feasibility Study
SEPA	State Environmental Policy Act
Site	Terminal 5 Former Alcoa Site
SMS	Sediment Management Standards
SWAC	Surface area–weighted average concentration
TEF	Toxic equivalency factor
TEQ	Toxic equivalent
TOC	Total organic carbon
USACE	U.S. Army Corps of Engineers
V-SAM	Vibracore sediment acquisition monitoring
WAC	Washington Administrative Code

1.0 Introduction

This Interim Action Work Plan (IAWP) has been prepared on behalf of the Port of Vancouver (Port) for the Former Alcoa Vancouver Site, hereafter referred to as the Terminal 5 Alcoa Vancouver Site (Site), located in Vancouver, Washington (Figure 1.1). The IAWP describes the Port's proposed cleanup action to remedy remaining sediment contamination present within the Terminal 5 sediments as an Interim Action. The IAWP also describes the approach for sediment sampling that will be needed to inform remedial design of the Interim Action. The work is being conducted in accordance with an Agreed Order (AO; Order #XXXXXX) between the Port and the Washington State Department of Ecology (Ecology). As described in Washington Administrative Code (WAC) 173-340-430, an interim action is "a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance" and/or "corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed." As stated in WAC 173-340-430(4)(b), "Interim actions shall be followed by additional remedial actions unless compliance with cleanup standards has been confirmed at the site."

The previous sediment remedial activities at the Site were conducted by Alcoa under the terms of a Consent Decree and the 2009 Cleanup Action Plan (CAP) between Alcoa and Ecology. Terminal 5 sediments have not been dredged since completion of the cleanup activities in 2009. As part of an effort to bring Berth 17 into the Port's Maintenance Dredging Program, sampling in 2018 and 2019 found remaining polychlorinated biphenyl (PCB) contamination in the original 2009 cleanup action footprint, as well as localized polycyclic aromatic hydrocarbon (PAH) contamination. Subsequent sediment sampling conducted by Alcoa in 2021 and 2022, to support Ecology's 2020 periodic review process, and further sampling by the Port, identified additional remaining PCB contamination and PAH contamination throughout the Terminal 5 sediments.

Given that remediation of the Site sediments is not complete, Ecology has determined that an Interim Action is warranted under WAC 173-340-430. The Port plans to conduct a phased Interim Action consisting of dredging of PCB- and PAH-contaminated sediment. A phased remedy will ensure that the contaminated sediments upriver of the existing Terminal 5 Berth 17 dock and within the extent of potential future in-water structure construction is addressed in 2026, with the remaining downriver sediment contamination addressed in 2027. If a current prospective tenant does not select Terminal 5, the Port remains committed to leading the sediment cleanup but will evaluate execution of the Interim Action as one single construction season event, rather than in two phases. Depending on the Port's coordination with prospective tenants and/or agency coordination and approvals, work could occur during one in-water work window in either 2026 and early 2027 or 2027 and early 2028.

The Port's objectives in leading the Interim Action are as follows:

- As the landowner and long-term steward, ensure that the cleanup action is conducted in accordance with Model Toxics Control Act (MTCA) and Sediment Management

Standards (SMS) (Chapter 173-204 WAC) and achieves cleanup standards to provide protection of human health and the environment.

- Address the contamination in a timely manner to improve environmental and human health protection as soon as practicable.
- Bring Terminal 5 into functional use, as was expected following the 2008 to 2009 sediment remedy, and in alignment with the Port's mission to provide economic benefits and jobs to the local community.

1.1 PURPOSE OF THE INTERIM ACTION WORK PLAN

The IAWP has been prepared in accordance with WAC-173-340-430(7). The purpose of the IAWP is to describe the Interim Action that has been selected as the cleanup action, summarize existing information collected during previous environmental investigation efforts, and describe the Pre-Design Investigation (PDI) activities that will be completed to fill data gaps of contamination in sediment (both vertically and horizontally) to provide sufficient information to evaluate and finalize design of the cleanup action.

1.2 DOCUMENT ORGANIZATION

The following sections of this document are organized as follows:

- **Section 1.0**—Introduction and purpose of the Interim Action, including document organization.
- **Section 2.0**—Background. Describes the Site history, including Site features and Site use. Also provides a summary of the 2008 to 2009 Remedial Action, Port sediment sampling results, and a summary of the 2020 periodic review process and sampling.
- **Section 3.0**—Conceptual Site Model. Describes the physical setting of Terminal 5, identifies the areas of concern, identifies potential release mechanisms and historical sources, and provides a summary of exposure pathway analysis.
- **Section 4.0**—Project Team and Responsibilities. This section describes the project team involved in the Interim Action, including the Port, Ecology, Floyd|Snider, and the subconsultants that will assist with the PDI.
- **Section 5.0**—Proposed Interim Action. This section provides an overview of the planned Interim Action and the key components to be further developed in the forthcoming Engineering Design Report (EDR).
- **Section 6.0**—Pre-Design Investigation. This section describes the sampling approach for the PDI investigation, including collection of sediment cores, sediment grab samples, and bulk sediment analyses, as well as a bathymetric survey.
- **Section 7.0**—Permitting and Applicable or Relevant and Appropriate Requirements (ARARs). This section describes the applicable permits and ARARs for the Interim Action.

- **Section 8.0**—Schedule and Reporting. Presents the schedule and reporting requirements for the Interim Action.
- **Section 9.0**—References. Includes a list of references included in the IAWP.

Supporting information is provided in the following appendices:

- **Appendix A—Field Sampling Plan (FSP).** Presents the field procedures for the Interim Action PDI sampling.
- **Appendix B—Quality Assurance Project Plan (QAPP).** Presents the quality assurance objectives, methods, and procedures for PDI sample analysis. The QAPP follows Ecology's Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (December 2016).
- **Appendix C—Health and Safety Plan (HASP).** Presents site-specific safety practices and procedures for all personnel involved with collection of environmental media and field data for the PDI.
- **Appendix D—State Environmental Policy Act (SEPA) Checklist.** Presents SEPA checklist for the Interim Action.
- **Appendix E—Inadvertent Discovery Plan (IDP).** Presents the IDP that will be followed during the Interim Action, in accordance with the Ecology guidance and Cultural Resources Protection requirements under WAC 173-340-815.
- **Appendix F—2009 to 2020 Bathymetric Comparison of Terminal 5 Sediments.** Bathymetric comparison prepared by the Port to support bringing Berth 17 into the Port's Dredging Program.

2.0 Background

2.1 SITE HISTORY

The Site covers approximately 208 upland acres and an additional in-water portion of Terminal 5 and is bound on the north by NW Lower River Road, on the east by property owned by the Port, on the south by the Columbia River, and on the west by multiple industrial property owners.

The upland portion of the facility was developed in the 1930s with aluminum smelter operations beginning in 1940. The smelting complex consisted of an aluminum smelter and a series of fabrication plants, where aluminum metal was formed into wire, rod, and extruded channel (Anchor QEA 2009). A variety of materials and potential contaminants were handled at the property during historical operations that contributed to soil, groundwater, and sediment contamination. There were numerous aboveground storage tanks present on site that stored various fuel oils and two transformer/rectifier stations present that were a source of PCBs.

Alcoa operated the entire facility for approximately 45 years, until 1986. Smelter operations were continued by Vanalco, Inc., which operated until declaring bankruptcy in 2000. Glencore Washington LLC (now known as Evergreen) purchased the smelter assets from the bankruptcy estate in 2002.

Contamination was found in sediments starting in the mid-1990s. In 1997, the Clark County Public Utilities (CPU) constructed a 12-inch-diameter submerged outfall pipeline to carry non-contact cooling water for discharge into the Columbia River. Sediment samples collected in the sediment surrounding the outfall exceeded SMS cleanup levels (CULs) for PCBs at the time. Subsequently, as requested by Ecology and Washington State Department of Natural Resources (DNR), an upland study was conducted to determine whether the PCB contamination encountered during CPU's sediment sampling was related to releases from a nearby landfill (the Alcoa East Landfill) or an ongoing source. During the investigation, additional sediment samples were collected and another hot spot of PCBs was discovered, also near the CPU outfall, which is located on the south bank area along the shoreline.

It was determined that the elevated PCBs in sediments resulted from the disturbance of riverbank soils during construction of the outfall. Historically, a localized release contributed to elevated PCBs on the bank. It was determined that, during construction of the outfall, contaminated soils were released from the bank, migrated into the nearshore sediment, and were subsequently distributed across a larger area of the riverbed through hydrodynamic forces (Windward 2001).

In June 2008, Ecology issued an Enforcement Order to Alcoa (Ecology Order No. DE 5660) for a series of upland and shoreline remedial actions. In January 2009, Alcoa entered into Consent Decree No. 09-2-00247-2 with Ecology, which required Alcoa to implement a 2008 CAP to address contamination in a September 2008 Remedial Investigation/Feasibility Study (RI/FS) as part of a final cleanup action for the Site. Numerous cleanups were completed by Alcoa on its 97 upland acres of the original 208-acre smelter property. Additional remedial actions were performed by

Evergreen in their 111 acres of uplands under Enforcement Order 4931. Between October 2008 and April 2009, a sediment cleanup was performed by Alcoa that involved dredging of PCB-contaminated sediment along the shoreline and placement of enhanced natural recovery (ENR) sand (for more details on the 2008 and 2009 Remedial Action, refer to Section 2.3). Because post-dredge sediment samples were not collected from the post-dredge leave surface (as is typical during remedial dredging projects), there was no confirmation that all contaminated sediment was removed during the sediment cleanup.

Alcoa's final Consent Decree was entered after the Port and Alcoa entered into the agreement for the purchase of the Site. The Port is not a party to the Consent Decree but is bound by its terms. Between January and March 2009, ownership of Terminal 5 was transferred from Alcoa and Evergreen to the Port.

2.2 SITE FEATURES AND SITE USE

The Terminal 5 property is located along the Columbia River at 5701 NW Old Lower River Road, River Mile 103, approximately 3 miles northwest of Vancouver, Washington (Figure 1.1). The in-water portion of Terminal 5 (which includes the anticipated extent of the sediment Interim Action) consists of six parcels, five of which are owned by DNR and managed under a Port Management Agreement; one parcel is owned by the Port (refer to Figure 2.1). Terminal 5 is a relatively small portion of the Port's over 1,600 acres of working industrial and commercial businesses.

The current zoning classification for the in-water parcels is "Water," while the adjacent upland parcels are zoned "Heavy Industrial." There is no public access allowed to either the Berth 17 dock or the shoreline.

The Berth 17 vessel berth consists of an approximately 425-foot dock constructed in 1967 with a concrete superstructure supported on prestressed concrete pilings. A new fender system, mooring dolphins, pedestrian access catwalks, and vehicular access causeway support the dock and provide access to the shoreline.

The purchase and sale agreement between the Port and Alcoa described that the Port's intended use included "use, operate and/or lease the Property for industrial purposes, and to use the existing dock facility for the loading and unloading of merchant vessels." However, due to contamination remaining within the Site sediments, the Port has been unable to develop or use Terminal 5 for most commercial operations. Since acquiring the facility, the in-water portion of Terminal 5 has not been used for active operations; Berth 17 has been used as a lay berth, while parts of the Terminal 5 uplands have been used for materials laydown and storage and rail loading and unloading.

As the property owner, the Port's primary objectives are to ensure that operations at Terminal 5, in the area of the Site, do not result in risk to human health and the environment from the disturbance of contamination left in place, and that any necessary actions to prevent these risks are undertaken by Alcoa in accordance with Consent Decree No. 09-2-00247-2, the CAP (Ecology 2008), and MTCA (WAC 173-340). Completion of the Interim Action will serve to remove

remaining sediment contamination, substantially reducing human health and ecological risk associated with the failed 2009 remedy, and support full operational use of Terminal 5.

2.3 FORMER ALCOA VANCOUVER SITE—2008 TO 2009 INVESTIGATION AND CLEANUP ACTION

In 2008, Alcoa entered into Consent Decree No. 09-2-00247-2 with Ecology to prepare an RI/FS and CAP as part of a final cleanup action for the Site. This section provides an overview of the sediment cleanup action conducted by Alcoa.

2.3.1 Overview of Sediment Cleanup Standards

This section outlines the cleanup standards and points of compliance (POC) established under the Interim Action for the Site to address PCB and PAH contamination in sediment. The cleanup standards define the concentration of a contaminant in environmental media that is protective of human health and ecological receptors, and the POC defines where the cleanup standards must be met within the Site. The receptors, cleanup standards, and cleanup standard comparison methodology are presented in Table 2.1.

Table 2.1
Interim Action Sediment Cleanup Standards

Analyte	Receptor	Cleanup Standard (µg/kg)	Cleanup Standard Comparison Methodology [1] and Source
Total PCB Aroclors	Human Health	97	SWAC; sediment CUL developed in the RI/FS and established as the sediment cleanup standard in the CAP and Consent Decree
Total PCB Aroclors	Benthic	110	Point-by-point; SMS freshwater sediment cleanup objective [2]
Total PAHs	Benthic	17,000	Point-by-point; SMS freshwater sediment cleanup objective [2]

Notes:
1 The point of compliance in sediment is the top 10 centimeters.
2 Per Ecology guidance (2021), the SCO (WAC 173-204-560(3)) is the long-term sediment quality goal.

Abbreviations:
µg/kg Micrograms per kilogram
SWAC Surface area–weighted average concentration

The site-specific CUL for total PCB Aroclors of 97 µg/kg based on human health exposures was established in the RI/FS (Anchor Environmental 2008) and confirmed as the CUL in the CAP (Ecology 2008) and Consent Decree (Clark County Superior Court 2009). This CUL was also used in the Final Periodic Review Data Report prepared for the Alcoa Corporation by Anchor QEA (2024). The total PCB Aroclors CUL was derived as a risk-based threshold using MTCA baseline human cancer risk equations for CUL development (WAC 173-340-708). The CUL was calculated

based on a target risk level of $1x10^{-5}$, a diet fraction (clams) of 25%, and a shellfish consumption rate of 18 grams per day. Consistent with WAC 173-340-708(10)(b), the default diet fraction was modified based on the limited availability of potentially harvestable shellfish at the site given local sediment habitat[1] and hydrologic conditions. Consistent with WAC Interim Action guidance (WAC 173-340-430(1)(a)), the Interim Action complying with the CUL established in the CAP will substantially reduce human health and ecological exposures and risks associated with the failed 2009 remedy while remaining achievable within the constraints of sediment remediation under MTCA. To assess achievement of the Interim Action, the human health CUL will be compared to the SWAC.

Sediment data will also be compared to the Washington State SMS benthic freshwater sediment cleanup objective (SCO) for total PCB Aroclors of 110 µg/kg. Achievement of this standard will be evaluated on a point-by-point basis.

As described in Section 2.6, detected PAHs do not indicate a potential risk to human health and are unlikely to pose a significant risk to the benthic community. Although sediments with elevated PAH concentrations are expected to be addressed within the remedial extent of PCB-contaminated sediments, data indicates heterogeneity exists within the sediments. To ensure the remediation of PCB contamination will encompass potential areas of PAH contamination, the PDI will also include (1) sample collection and analysis for PAHs and (2) comparison on a point-by-point basis to the Washington State SMS benthic freshwater SCO of 17,000 µg/kg.

PAH analyses are proposed at a subset of sample locations to characterize the lateral and vertical extent of PAH contamination in areas where data gaps exist. This targeted approach reflects the relatively limited number of total PAH exceedances of the SMS freshwater benthic criteria compared to the more widespread total PCB exceedances (refer to Section 2.6). As a result, there are fewer locations requiring additional PAH delineation.

2.3.2 Feasibility Study and Selected Remedial Alternative

The Alcoa feasibility study for the 2008 CAP evaluated several remedial alternatives for addressing PCB-impacted sediments at the site. The selected alternative, as documented in the CAP, prioritized mass removal of contaminants to the extent practicable. The feasibility study considered various combinations of dredging, capping, and monitored natural recovery before remedy selection (Anchor Environmental 2008).

Two remedial alternatives were evaluated: Sediment Removal Alternative (PIS-1)—Sediment Removal with ENR, and PIS-2—In Situ Containment with ENR. PIS-1 involved dredging and excavation of approximately 56,000 cubic yards (CY) of PCB-impacted sediment above the Remedial Action Level (RAL) of 320 µg/kg, followed by placement of approximately 60,000 CY of

[1] As documented in the RI/FS, based on surveys of available shellfish habitat, less than 0.35 of 16 acres (2%) of the Site investigated during the RI/FS contains sandy substrate at water depths typically suitable for shellfish production and harvesting. Asian clams (the predominant shellfish) were also identified within a deeper water habitat within a 0.5-acre area. Harvest from this area (typically 10 to 15 feet of water) is generally not feasible throughout most of the calendar year.

ENR sand to restore pre-construction grades, manage residual contamination, and ENR. Shoreline stabilization measures were also included. PIS-2 proposed the use of in situ containment of PCB-impacted sediments rather than removal. It included placement of an ENR cap over sediments that exceeded the CUL to limit exposure and facilitate recovery. PIS-2 also included implementation of institutional controls to restrict activities that could disturb capped sediments (Anchor 2008).

PIS-1 sediment removal with ENR was selected as the preferred alternative, as it was expected to provide the greatest long-term risk reduction, maximize mass removal, and align with regulatory cleanup objectives under MTCA. The selected alternative also aimed to achieve the site-specific total PCB Aroclors CUL to ensure long-term environmental protection.

2.3.3 Description of the 2009 Sediment Cleanup Action

The sediment cleanup action at the site, conducted from December 2008 to February 2009, involved removal of approximately 49,990 CY of PCB-impacted sediment through mechanical dredging. Sediment was removed using upland-based excavators and in-water dredging equipment, with temporary barriers in place to manage water quality. In addition to PCB-contaminated sediment, creosote-treated piles, process residue (i.e., tar), iron slag, asbestos, and miscellaneous debris were also removed from the shoreline, along with the removal of Asian clams and completion of a habitat enhancement area (Anchor QEA 2009).

According to the 2009 Project Completion Report, all dredge units met the required design dredge cuts, which ranged from approximately 0.5 to 3.5 feet (Anchor QEA 2009). Dredging targeted sediment with PCB concentrations greater than the RAL of 320 µg/kg. As described in the CAP, ENR sand was to be placed in areas with sediment with PCB concentrations less than the RAL but greater than the CUL of 97 µg/kg. At least 6 inches of sand was placed to restore post-dredge surfaces to pre-existing grades and provide ENR. ENR sand placement was implemented to comply with the Site CUL, which was evaluated on a SWAC basis in accordance with the CAP.

Upon completion of dredging, grab samples for performance monitoring[2] were collected from 0 to 10 cm below mudline (bml), the point of compliance established in the CAP, at nine locations within the cleanup action area on February 17 and 18, 2009 (Anchor QEA 2009). Thus, the performance sediment samples were collected from within the surface ENR sand layers placed in the weeks prior to sampling. No samples were collected from the post-dredge surface prior to the placement of ENR sand to assess sediment concentrations remaining after dredging. All discrete performance surface sediment results were less than the RAL of 320 µg/kg and the SMS freshwater SCO for total PCBs of 110 µg/kg, and the SWAC was less than the Site CUL of 97 µg/kg. No confirmation monitoring[3] was performed.

[2] WAC 173-340-410(b)
[3] WAC 173-340-410(c)

2.4 PORT OF VANCOUVER BERTH 17 SEDIMENT SAMPLING

In 2018, the Port initiated efforts to incorporate Berth 17 into its existing maintenance dredging program to maintain operable berth depths and obtain a suitability determination from the Portland Sediment Evaluation Team for the future maintenance dredged material. In December 2018, three cores and two slough samples were collected from Berth 17. The results identified PCBs exceeding the SCO within the proposed dredge prism (and 2009 cleanup action footprint) and localized PAH contamination (Table 2.2). In July 2019, the Port conducted additional sediment sampling within Berth 17, as well as upriver and downriver, to understand sediment conditions relative to potential future operational use. A total of six surface grabs and eight sediment cores were advanced. Consistent with the 2018 data, the results indicated that elevated concentrations of PCBs are present in surface sediment and shallow subsurface sediments directly waterward of the Berth 17 dock and directly upriver (Table 2.2).

In June and July 2021 (concurrent with 5-year periodic review activities described below), the Port also collected sediment samples along the pier-face of Berth 17 to document surface and shallow subsurface conditions prior to fender pile replacement. This sampling, which was conducted as part of the Berth 17 Rehabilitation Project advanced six surface grabs and four sediment cores along the Berth 17 dock for the analysis of PCBs and PAHs. Similar to the 2018 and 2019 data, the results of the pre-fender pile replacement sampling indicated that elevated concentrations of PCBs are present in surface sediment and shallow subsurface sediments adjacent to the dock. In May 2022, the Port collected post-fender pile samples at six locations along the Berth 17 dock to determine whether the pile replacement altered sediment chemistry or the mudline elevations in the vicinity of pile replacement. None of the samples exceeded applicable criteria for PCBs, but one sample exceeded the SCO for total PAHs.

2.5 CURRENT ECOLOGY PERIODIC REVIEW

Ecology conducted its first periodic review of the Alcoa site in 2015. However, this periodic review did not include an evaluation of the sediment remedy and in describing the PCB-contaminated sediments remediation of 2009, Ecology stated that *"[a]ll confirmation sediment samples met Site cleanup levels for PCBs and PAHs*." In Ecology's 2015 protectiveness determination, Ecology concluded that *"[t]he cleanup actions completed at the Alcoa Vancouver Site appear to be protective of human health and the environment*."

As described above, the 2018 and 2019 sediment sampling conducted by the Port identified PCB and PAH contamination within the footprint of the 2008 to 2009 remedial action. This discovery of existing contamination prompted Ecology to request additional data to support its upcoming 2020 periodic review. The 2020 periodic review process was to include a work plan by Alcoa, additional sediment sampling and reporting by Alcoa, and preparation of the 5-year review by Ecology. Initially, this process was expected to conclude by the end of 2022. However, because of delays in data collection and analyses, the periodic review is still in process and is expected to be completed in 2025, prior to implementation of the Interim Action. The purpose of the periodic review is to evaluate whether the sediment remedy implemented by Alcoa in 2008 and 2009 has remained stable as designed and is protective of human health and the environment. The

sampling conducted by the Port (as previously described) and the 2021 and 2022 periodic review sampling that is described below indicates PCB contamination remained in place following the 2009 cleanup action.

2.5.1 Summary of 2021 and 2022 Periodic Review Sediment Sampling

In August 2021, Alcoa's Work Plan to support Ecology's periodic review process was approved by Ecology, and Alcoa conducted sediment sampling within and adjacent to the Berth 17 dock. A total of 28 surface grab samples were collected and 11 sediment cores were advanced. The results indicated that PCB and PAH contamination was present throughout the berth both in surface and subsurface sediments (Table 2.2). Alcoa prepared a data report in May 2022 to summarize the results of the 2021 event. Upon review of the data report by Ecology, the Yakama Nation, and the Port, Ecology required Alcoa to re-collect the subsurface samples because of significant data quality issues and inadvertent disposal of sediment samples by the laboratory. Sample re-collection required additional coordination between Alcoa, Ecology, the Yakama Nation, and the Port. Alcoa prepared a Work Plan Addendum and a second field event took place in November 2022 that consisted of sampling from 6 additional surface grab locations and 14 additional sediment core locations.

Alcoa submitted a revised data report in March 2023, which also described the results of the November 2022 event. Results were consistent with previous sampling, with elevated PCBs in the Terminal 5 sediments. Because of technical issues and inaccuracies presented in the report, Ecology requested a report revision. A revised data report was submitted to Ecology by Alcoa in October 2023. The Port and the Yakama Nation provided comments on the revised report in December 2023. A revised/final version of the data report was finalized in January 2024.

2.6 NATURE AND EXTENT OF CONTAMINATION

This section summarizes the nature and extent of PCB and PAH contamination based on analytical results from both surface and subsurface sediment samples collected during the 2018, 2019, 2021,[4] and 2022 field programs (Floyd|Snider 2019a, 2019b, 2022; Anchor QEA 2024). Table 2.2 provides a summary of all sediment PCB and PAH data collected for Terminal 5 since 2018. Additionally, a search of Ecology's Environmental Information Management (EIM) database was conducted including a query for sediment, tissue, porewater, and surface water collected at Terminal 5 since completion of the 2009 remedy. In general, all of the sediment data in EIM since this time is described above in Sections 2.4 and 2.5. In addition, there were four samples collected by Ecology's Water Quality Program and Toxics Cleanup Program, as part of an effort to provide ambient river water quality data from the Columbia River between River Miles 110 and 95. The samples were analyzed for field parameters and conventionals only. There were no porewater or tissue data samples collected at Terminal 5 since the completion of the 2009 cleanup action.

[4] Consistent with the final Data Report (Anchor QEA 2024), the 2021 PCB data collected by Anchor QEA and analyzed by ALS on behalf of Alcoa are not included in the dataset for the IAWP due to data quality issues.

2.6.1 Total Polychlorinated Biphenyl Aroclors

Detected total PCB Aroclor concentrations in surface sediment ranged from 2.5 to 4,600 µg/kg, with a detection rate of 82%. Of the 73 samples analyzed (excluding field duplicates), 22 exceeded the SMS benthic freshwater SCO of 110 µg/kg.

As presented in Table 2.1 (refer to Section 2.3.1), the comparison methodology for determining compliance with the human health CUL for total PCB Aroclors is a SWAC. In the Final Periodic Review Data Report, a SWAC of 215 µg/kg was estimated based on inverse distance weighting (IDW) interpolation of untransformed data (Anchor QEA 2024).[5] This represents an exceedance of approximately 2 times the human health CUL. For additional context, 24 of the 73 surface sediment samples exceeded the human health CUL of 97 µg/kg.

Detected total PCB Aroclor concentrations in core samples collected from 37 locations ranged from 10 to 18,000 µg/kg, with a detection rate of 85%, down to a maximum depth of 3.8 feet bml. Of the 103 samples analyzed (excluding field duplicates), 44 samples from 17 locations exceeded the SMS benthic freshwater SCO of 110 µg/kg.

2.6.2 Polychlorinated Biphenyl Congeners

Total PCB congener data consists of the results from 11 surface samples and 1 core interval sample. The PCB congener toxic equivalent (TEQ) concentrations are presented in Table 2.2. PCB TEQ concentrations in surface sediment ranged from 8.97×10^{-7} to 0.0319 µg/kg. The PCB TEQ concentration in the core interval sample (VC-07-0-2-071119) was 9.52×10^{-5} µg/kg.

A PCB congener TEQ site-specific human health screening level of 0.0015 µg/kg was developed in the Periodic Review Work Plan (Anchor QEA 2021). Of the 12 samples, 9 surface samples exceeded the PCB congener TEQ screening level. The core sample PCB congener TEQ was less than the screening level.

Toxic equivalency factors (TEFs) are used to calculate TEQ values by multiplying the concentration of each dioxin-like PCB congener by its respective TEF, which estimates its toxicity relative to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin, the most toxic dioxin, and summing the results. Accurate TEQ estimation requires congener-specific PCB data. The correlation between total PCB Aroclors and dioxin-like PCB TEQs is generally poor and unreliable. Because even strong correlations between total PCB congeners and Aroclor concentrations can be driven by a small number of high outliers and are highly site-specific, it is not appropriate to estimate dioxin-like PCB congener TEQs from Aroclor data.

For example, in the evaluation of the relationship between total PCB Aroclors and total PCB congeners for the Lower Duwamish Waterway (LDW; Windward 2018), a high correlation coefficient (r = 0.97) was identified but was largely driven by just 2 out of 51 samples with PCB

[5] This interpolation method was selected based on a sensitivity analysis and as requested by the Port and Ecology. It was determined that the SWAC produced by the IDW interpolation of log-transformed data was lower than the other methods evaluated and was likely biased low (Anchor QEA 2024).

concentrations exceeding 600 µg/kg, while most of the samples had concentrations less than 300 µg/kg. Additionally, in the LDW evaluation, Aroclor data often under- or over-estimated congener sums beyond acceptable analytical variance.

At the Terminal 5 Alcoa Vancouver Site, the dataset containing both PCB Aroclor and PCB congener results is even smaller, increasing the uncertainty in any correlation. Because no single correlation approach can be reliably applied across datasets and given the risk of significant error (even with a larger dataset), PCB TEQs were not estimated from Aroclor data for this Site.

2.6.3 Total Polycyclic Aromatic Hydrocarbons

Detected Total PAH concentrations in surface sediment ranged from 2.3 to 63,000 µg/kg, with a detection rate of 86%. Of the 69 samples analyzed (excluding field duplicates), 5 exceeded the SMS benthic freshwater SCO of 17,000 µg/kg.

In the Final Periodic Review Data Report, a SWAC of 262 µg/kg was estimated for cPAH TEQ based on the application of Thiessen polygons. The cPAH TEQ SWAC was considerably less than the human health screening level for cPAHs of 21,000 µg/kg, indicating PAHs do not pose a potential risk to human health.

Detected Total PAH concentrations in subsurface sediment samples collected from 29 core locations ranged from 14 to 110,000 µg/kg, with a detection rate of 98%. Of the 61 samples analyzed (excluding field duplicates), 5 samples from 4 locations exceeded the SMS benthic freshwater SCO of 17,000 µg/kg.

3.0 Conceptual Site Model

This section describes the conceptual site model, identifying the historical sources of sediment contamination, fate and transport pathways, the human and ecological receptors that may be exposed, and exposure pathways.

3.1 PHYSICAL AND HABITAT FEATURES

The sediment substrate at Terminal 5 consists of typical Columbia River sands, silt, gravel, and native rock alluvial deposits and occasional anthropogenic debris. Little to no aquatic vegetation exists within the in-water portion of Terminal 5, and upland vegetation is sparse (consisting of blackberry and grass) along the armored shoreline.

3.2 SOURCES

The source of current contamination was determined to be from historical operations at Terminal 5. As described in Section 2.1, elevated PCBs in sediments were determined to be from the disturbance of riverbank soils during the 1997 construction of an outfall. Construction of the outfall displaced contaminated soils from a previously localized PCB release, allowing them to migrate into nearshore sediment and disperse across a larger area of the riverbed through hydrodynamic forces (Windward 2001). There are no ongoing sources of PCBs to Site sediments.

At Terminal 5, creosote-treated piles and process residues (e.g., tar), which were removed from the shoreline during the 2009 cleanup, were likely PAH sources prior to their removal. There are no ongoing sources of PAHs from the Site to sediments.

As described in Section 2.3, in 2008 and 2009, Alcoa conducted a sediment cleanup involving dredging and placement of 6 inches of ENR sand (Anchor QEA 2009). As described above, subsequent sampling from 2018 to 2022 identified PCB and PAH sediment contamination within the footprint of the 2008 to 2009 cleanup action. Based on the surface and subsurface detected concentrations and evaluation of mudline elevations over time, it is expected that the contamination results from existing contaminated sediment left in place because of incomplete dredging, incomplete sediment characterization, unsampled dredge residuals, and/or contaminated sediment now exposed because of the erosion of the ENR sand placed in 2009.

3.3 FATE AND TRANSPORT

Typical release mechanisms of PCBs and PAHs from sediments to other media include the following:

- Physical disturbances can resuspend contaminated sediments, potentially increasing contaminant concentrations in the water column.
- PAHs and PCBs can slowly diffuse from sediment porewater into the overlying water column.

- Due to their stability and lipophilicity, PCBs can bioaccumulate in the tissues of organisms over time from exposure in sediments and surface water and biomagnify in aquatic food webs.
- Erosion from river currents, wave action, and storm events can transport sediment.
    - During the 2018 and 2019 Port sediment sampling efforts in and adjacent to the Berth 17 dock (as well as other sampling event within the Terminal 5 sediments), no ENR sand that was placed as part of the 2009 remedial action was encountered. Comparison of bathymetric elevations from 2009 and 2018 (Sheet 4; Appendix F) indicate areas of substantial erosion with some localized areas of deposition. Generally, there were deeper mudline elevations in 2018 relative to the final post-dredge/post-ENR sand placement elevations in 2009 (Floyd|Snider 2020).
    - As part of a bathymetric analysis by the Port to support Berth 17 being added to the Port's Dredging Program, the 2009 to 2018 bathymetry comparison was updated to compare the post remedy 2009 bathymetry to 2020 bathymetry. In addition, the 2009 bathymetry data were also compared with bathymetry data from multiple years spanning between 2009 and 2020 (Sheets 5 to 7; Appendix F). These comparisons support the 2018 comparison and show (1) a continuous trend of scour and erosion (with elevations reduced several feet in some places), with some small areas of deposition and (2) a likely sloughing event upslope of identified areas of deposition off the Berth 17 dock.

3.4 RECEPTORS AND EXPOSURE PATHWAYS

Aquatic Receptors

Exposure pathways from Site sediments to benthic invertebrates, fish, and bivalves are complete. Benthic organisms, including filter feeders and deposit feeders, may accumulate PAHs and PCBs through direct contact with contaminated sediment, ingestion of sediment or organic matter, and filtration of suspended particles. Contaminants can also transfer through the food chain, with bottom-feeding fish ingesting contaminated sediment or prey, and pelagic fish consuming exposed fish and benthic organisms. However, impacts to fish populations, including salmonids, are not anticipated due to the small size of the site relative to their home range. Additionally, any potential unacceptable risk to fish from Site sediment will be substantially reduced by addressing potential risk to benthic invertebrates.

Aquatic-Dependent Bird and Mammal Receptors

Birds and mammals present in the area could include seabirds (e.g., gulls, shearwaters, terns), waterfowl (e.g., ducks, mergansers, loons, grebes), and mammals such as sea lions, seals, and otters. While exposure pathways are complete, including biomagnification through the aquatic food web, they are considered insignificant due to the wide foraging ranges of these species. Any potential unacceptable risk to these receptors from Site sediment will be substantially reduced by addressing potential risk to benthic invertebrates.

Human Receptors

Direct exposure pathways for human receptors, such as contact with in situ sediment, dredged material, or suspended sediments, were determined to be incomplete, as public access to the dredge area is limited. Dietary exposure pathways, including ingestion of fish and shellfish that may use the in-water sediment area, were determined to be complete. While hunters or fishers may consume organisms from the area, exposure to site contaminants through prey consumption is expected to be minimal due to the small size of the Site relative to the home range of fish and the limited habitat available for shellfish. As documented in the RI/FS, less than 0.35 of 16 acres (2%) of the Site investigated during the RI/FS contains sandy substrate at water depths typically suitable for shellfish production and harvesting (Anchor Environmental 2008). Asian clams (the predominant shellfish) were also identified within a deeper water habitat within a 0.5-acre area. However, harvest from this area is generally not feasible because water depths are typically 10 to 15 feet.

4.0 Project Team and Responsibilities

4.1 KEY ORGANIZATIONS AND ROLES

- **Ecology Project Manager.** The Interim Action will be conducted under the authority of Ecology's Industrial Section Project Manager Dave Johnson.
- **Ecology Sediment Specialist.** The Interim Action will be overseen by Kevin Kalefern, Ecology's Toxics Control and Aquatic Cleanup Unit Supervisor.
- **Port of Vancouver.** The Port is the current owner of Terminal 5 and will be responsible for overall Interim Action implementation, oversight, and contracting.
- **Floyd|Snider.** Floyd|Snider will lead all PDI planning, sampling, permitting, and reporting for the Interim Action. Floyd|Snider will also be the design engineer for the Interim Action, with geotechnical support provided by an additional teaming partner. Floyd|Snider will assist the Port with construction management and survey coordination and will perform the post-dredge confirmational sampling.
- **Apex Laboratories, LLC.** All laboratory analysis for the PDI investigation and post-dredge sampling will be conducted by Apex Laboratories, LLC, including the dredging elutriate test (DRET) and elutriate analysis.
- **Gravity Marine.** The PDI sediment sampling will be conducted by Gravity Marine. Sediment sampling will consist of surface grab sampling and vibracore sediment coring, utilizing incremental data acquisition methodology.

5.0 Proposed Sediment Interim Action

The Port has proposed a phased Interim Action to address the site sediment contamination in a timely manner to substantially reduce the environmental and human health exposures and risk associated with the failed 2009 remedy and bring Terminal 5 into functional use as soon as practicable. The phased remedy is proposed to include cleanup of contaminated sediments upriver of the existing Terminal 5 dock in 2026, with cleanup of the remaining downriver sediment contamination in the vicinity of the Terminal 5 dock in 2027. The spatial extent of Phase 1 and Phase 2 of the Interim Action will be informed by the results of the PDI. The Port is committed to leading the sediment cleanup, and depending on the final design, the Port's coordination with prospective tenants and/or agency coordination and approvals, work could occur during one in-water work window in either 2026 or 2027.

Because the Port's goal is to have a final remedy and unencumbered use of the facility, the Port proposes removal of PCB- and PAH-impacted sediments via dredging. Sediment removal via dredging was evaluated as part of the original site cleanup alternatives analysis and was consistent with the selected cleanup action in 2009. However, the 2009 cleanup action did not include complete removal of contaminated sediments and instead relied on the placement of 6 inches of ENR sand to achieve cleanup standards. The intent of the proposed Interim Action is to remove contaminated sediments in accordance with cleanup standards to a final clean surface. Based on the existing site sediment data, this appears to be feasible, but additional vertical and horizontal delineation data obtained during the PDI will inform the development of dredge extents to be presented in the EDR for Ecology review and approval. In addition, the EDR will include evaluation of other site-related constraints, such as the potential need for localized armored capping if dredging to clean depth is not feasible around existing structures or riprap.

The proposed Interim Action will actively address total PCBs and total PAHs contamination in Site sediments and comply with Site cleanup standards in accordance with WAC 173-340-430. The Interim Action objectives include achieving a post-dredge leave surface that (1) complies with the site-specific Total PCB Aroclors CUL on a SWAC basis and (2) contains no individual locations with concentrations greater than the SMS SCO for either total PCBs or total PAHs. Sediment will be dredged using standard means of a mechanical clamshell bucket and transported off-site to a licensed upland disposal facility. The Interim Action involves removal of contaminated sediments, occurring on parcels owned by the State of Washington or the Port; therefore, no institutional controls are required (refer to Figure 2.1 for parcels). Key design details will be further developed in the EDR, which will be prepared following the collection of additional site data through the PDI. These key design details that will be developed in the EDR include those listed below:

- **Dredge Extent:** The vertical and lateral extents of total PCBs and total PAHs contaminated sediment exceeding the cleanup standards require additional delineation to support Interim Action design. Additional data collected as part of the PDI will be evaluated as part of the EDR to determine dredge prisms, calculate total volume of contaminated sediment to be removed, and define the spatial extents of the Interim Action phases. The PDI sampling plan is described in Section 6.0.

- **Best Management Practices (BMPs):** BMPs the contractor will implement during dredging, sediment handling and transloading, and sediment dewatering activities to minimize resuspension of sediments and impacts to water quality will be outlined in the EDR. The potential for sand placement as a dredge residual management BMP will be evaluated in the EDR if deeper subsurface contamination is encountered (depending on dredge extents and feasibility). Additionally, if the results of the PDI indicate deep contamination exists adjacent to the existing Terminal 5 structure or existing armored caps constructed on the riverbanks in 2009, placement of a focused area of armored capping will be evaluated in the EDR.
- **Transload and Upland Disposal:** Dredged material will be transported by water-tight scows to an upland transload location, expected to be located at the Port or contractor yard within the vicinity of the site. Material will be transferred to the shore for stockpiling, dewatering, and disposal at a licensed upland disposal facility.
- **Management and Treatment of Contaminated Dredge Return Water:** Sediment removed during dredging will be dewatered prior to disposal at an upland facility and dredge return water will be treated to remove contaminants to concentrations less than the applicable water quality criteria prior to discharge. Requirements for the dewatering system, return water treatment system, water quality monitoring during return water discharge, and dewatered sediment stabilization for transport will be described in the EDR.
- **Compliance Monitoring:** Protection, performance, and confirmation monitoring requirements in accordance with WAC 173-340-410 will be described in the EDR. Water quality monitoring requirements, in accordance with Section 401 of the Clean Water Act and Washington State Water Quality Standards (Chapter 173-201A WAC), will be included in a Water Quality Monitoring and Protection Plan, which will be provided as an appendix to the EDR. Performance and confirmation monitoring will include progress and post-dredge bathymetric surveys to be performed by the contractor and post-dredge confirmation sampling to be performed by Floyd|Snider, on behalf of the Port. Sampling methodology for performance and confirmation monitoring of sediment will utilize the same sampling and analysis methodologies as described in the IAWP for the PDI.

6.0 Pre-Design Investigation

Sediment data collected between 2018 and 2022 by Alcoa and the Port, which were presented in the 2024 Final Periodic Review Data Report (Anchor QEA 2024), were evaluated to identify data gaps for remedial design. Table 2.2 provides a summary of all sediment total PCBs and total PAHs data collected for Terminal 5 since 2018. Based on this assessment, there are multiple areas across Site sediments where the vertical and/or horizontal extent of sediment concentrations exceeding cleanup standards requires further delineation to support cleanup design. Data quality objectives (DQOs) for a PDI were developed based on this evaluation, to direct planning and implementation of the PDI toward closing the remaining data gaps for remedial design. DQOs are documented in Table 6.1 and include vertical and lateral delineation of total PCBs and total PAHs concentrations requiring remediation and collection of additional site-wide sediment and surface water data for use in developing dredge return water treatment and the handling and transport of dredged material for disposal. The PDI activities described in this section were developed to delineate the necessary dredge extents and inform the spatial extents of the Interim Action phases. While the activities described herein are anticipated to occur as one event in summer 2025, an additional focused sediment sampling event could occur prior to completion of the EDR to support design if the analytical results of the PDI investigation indicate important data gaps still exist.

Proposed surface and subsurface locations to be sampled during the PDI are shown on Figures 6.1a and b, 6.2a and b, and 6.3a and b and are tabulated in Table 6.2. Figures 6.1, 6.2, and 6.3 each show interpolated total PCB Aroclors results for the 0 to 0.5 feet, 0.5 to 2 feet, and 2 to 4 feet bml depth ranges to illustrate the where PDI samples will effectively help to address data gaps or refine the extents of contamination. If the vessel currently moored at Berth 17 cannot be moved for the sampling event, then collection of sediment samples beneath the vessel will be assisted by divers as described in FSP Sections 4.1, 4.6.1, and 4.7 (Appendix A).

The majority of the mudline within the Terminal 5 navigable area is already at or deeper than -43 feet Columbia River Datum, the authorized navigational channel depth (Figure 6.1a). Therefore, the proposed Interim Action remedial dredging would be going below this authorized depth and deeper than what is needed for operational use and/or outside of navigable areas (i.e., shoreward of the face of a terminal/dock structure) solely for the purpose of removing contamination. The cleanup dredging will not be based on operational or maintenance dredging needs.

Specific details regarding sampling means and methods and analytical requirements are provided in the FSP and QAPP, attached to this document as Appendices A and B, respectively. A HASP for PDI activities has also been prepared and is attached as Appendix C. Additionally, an IDP was prepared and will be followed during in-water work; it is included as Appendix E.

6.1 SURFACE GRAB SEDIMENT SAMPLING

A total of 39 surface sediment grab samples are proposed to delineate the horizontal extent of total PCBs and total PAHs contamination in surface sediment. Surface sediment samples will be collected using a power grab sampler, as described in the FSP. Samples will be jarred and submitted for laboratory analyses in accordance with the QAPP. Analyses will include (1) PCBs and total solids for all samples and (2) PAHs, total organic carbon (TOC), and grain size analyses for approximately 44%, 56%, and 21%, respectively, of proposed samples.

At several locations (refer to Figure 6.1), proposed surface grab samples are collocated with proposed core samples. If the core is collected first and captures the surface interval with sufficient recovery and volume to subsample the surface from the core, the field team may elect to use this material for the surface sample and forgo collection of the collocated grab.

6.2 SEDIMENT CORE SAMPLING

A total of 38 sediment core locations are proposed to delineate the vertical and horizontal extent of total PCBs and total PAHs contamination in subsurface sediment. Proposed cores have been located to (1) delineate the vertical extent of contamination where existing data do not delineate the depth of contamination exceeding cleanup standards or (2) refine the depth of contamination where existing data include long core intervals that provide insufficient precision for design. Additional proposed cores have been located to delineate the horizontal extent of contamination exceeding cleanup standards in subsurface sediments. Eight of the proposed cores are secondary step-outs from contamination observed in the existing dataset and will be archived at the laboratory pending the results of the adjacent proposed primary step-out locations; these cores include an “Archive” notation in Table 6.2.

Based on the existing dataset and where additional vertical delineation is needed, the depths of proposed cores range from 4 feet to 8 feet (Table 6.2). In total, the proposed subsurface sampling includes 24 eight-foot cores, 13 six-foot cores, and 1 four-foot core.

Cores will be collected using vibracore sediment acquisition monitoring (V-SAM) incremental data acquisition methodology, where feasible. This methodology is based on conventional vibracore techniques but incorporates the use of two fathometers to accurately monitor both the depth of penetration into the sediment bed outside the coring tube and the height of the recovered core sample inside the coring tube throughout the course of the coring drive. The length of the V-SAM incremental coring drives and the frequency of the associated incremental depth and recovery measurements can vary with sediment lithology. This additional data is used to more accurately assign core sample intervals to their respective in situ depths than is possible in conventional vibracoring. V-SAM allows for accurate accounting of partial recovery (e.g., due to compaction, core plugging, or loss of sediment during extraction) incrementally throughout the core drive, rather than once over the full length of the recovered core as is necessary in conventional vibracoring. Therefore, V-SAM can be a preferred coring methodology to support dredge design relative to other conventional coring methods because of the improved resolution and ability to interpret in situ depths within the recovered core. V-SAM has also been used

effectively at other contaminated sediment sites in the region. The V-SAM coring methodology is described in detail in the FSP (Appendix A).

Sediment core samples will be processed as described in the FSP. Samples will be jarred and submitted for laboratory analysis in accordance with the QAPP. Analyses will include (1) total PCBs and total solids for all samples and (2) total PAHs, TOC, and grain size for approximately 55%, 52%, and 23%, respectively, of proposed samples.

6.3 BULK SEDIMENT AND WATER TREATABILITY TESTING

Bulk sediment and surface water samples will be collected and used for DRETs and water treatability jar tests. DRET elutriate will be analyzed and used to evaluate water quality BMPs for dredging. The DRET is a bench-scale test that simulates the mixing of surface water and sediment that occurs during dredging then allows solids to settle for a specified duration, after which elutriate can be extracted from the system for evaluation. Additional jar tests will be performed using the collected bulk sediment and surface water to further evaluate settling and water treatability for dredge return water treatment system design. Finally, treatability testing of bulk sediment to assess parameters such as physical stability and moisture retention for handling and disposal considerations will also be performed.

Representative sediment material from grabs and cores that are not needed for analytical testing (as described in Sections 6.1 and 6.2) will be collected and composited into three bulk sediment samples representative of the upstream, central, and downstream areas of the Site. A representative bulk surface water sample will also be collected from mid-water column at the Site. The composited sediment samples will be analyzed for the same parameters as the surface grab and core samples: total PCBs, total PAHs, total solids, TOC, and grain size. The bulk surface water sample, DRET elutriate, and, as applicable, jar test supernatant will each be analyzed for total PCBs, total PAHs, total suspended solids, and several conventional water quality parameters. Jar tests will be used for bench-scale water clarification testing to evaluate settling and water clarifying agent dosing for consideration in the design of a dredge return water treatment system.

Bulk sediment and surface water sampling are further described in the FSP, while the U.S. Army Corps of Engineers (USACE)-based DRET protocol and analyses of bulk sediment, surface water, DRET elutriate, and jar test supernatant, are further detailed in the QAPP.

6.4 BATHYMETRIC SURVEY

A multi-beam bathymetric survey will be performed as part of the PDI activities to capture current mudline elevations across the Site. Survey data will be incorporated into the EDR to inform dredge prism development and geotechnical slope stability analysis. The survey will be conducted by eTRAC, the surveyor that conducts the Port's annual maintenance dredging bathymetric surveys.

7.0 Permitting and Applicable or Relevant and Appropriate Requirements

The Interim Action will be conducted under an AO with Ecology. Per WAC 173-340-710(9)(b), remedial actions conducted under an AO are exempt from the procedural requirements of certain laws and all local and state permits but must comply with the substantive requirements of these laws and permits. Additional BMPs that will be implemented to meet the required ARARs will be described in the EDR submittal to Ecology.

The sediment Interim Action will require review through SEPA and a Nationwide Permit (NWP) 38 from the U.S. Army Corps of Engineers Portland District, as described below.

7.1 STATE ENVIRONMENTAL POLICY ACT REQUIREMENTS

Although the Interim Action will be exempt from state and local permitting as described above, SEPA environmental review is required for any state or local agency decision that meets the definition of an "action" and is not categorically exempt under SEPA. The Interim Action is considered an "action," so SEPA review is required.

The Port, as a municipal corporation of the State of Washington, has SEPA lead official authority. However, the Port recognizes the efficiency of having Ecology act in the SEPA lead official role for the environmental review of the MTCA Interim Action and Agreed Order process. The Port will work in collaboration with Ecology throughout the SEPA process.

The Draft SEPA Checklist is included as Appendix D. The Port will provide the Final SEPA Checklist to Ecology for determination, and the SEPA comment period will be combined with the 30-day comment period of the IAWP.

7.2 APPLICABLE FEDERAL, STATE, AND LOCAL PERMIT REQUIREMENTS

The Interim Action must comply with the substantive requirements of all applicable federal, state, and local laws. Together, these regulations and laws are identified as "Applicable or Relevant and Appropriate Requirements" or ARARs. The term "applicable requirements" refers to 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, contaminant of concern, or other circumstance at a site. The "relevant and appropriate requirements" are regulatory requirements or guidance that do not apply to a site under law, but have been determined to be appropriate for use by the U.S. Environmental Protection Agency.

This project is within the regulatory purview of USACE under a NWP 38. The NWP 38 provides federal authorization for specific activities required to clean up hazardous and toxic waste, and such an authorization is required for projects within waters of the state. The proposed Interim Action is consistent with the activities authorized under NWP 38 and the Port will submit the application for a NWP 38 following completion of the PDI and concurrent with the submittal of the Draft EDR to Ecology for review and approval.

The Washington State Shoreline Management Act (Chapter 90.58 RCW and Chapter 173-27 WAC) and the City of Vancouver's Shoreline Master Program do not require application for a substantial development permit or an exemption for this project. This project is not considered development and therefore not within the jurisdiction of said regulations.

8.0 Schedule and Reporting

8.1 PRE-DESIGN INVESTIGATION SCHEDULE

The PDI will commence following Ecology approval of the IAWP and in accordance with the schedule in the AO (AO XXXXXX). The PDI is expected to take up to 12 days to complete and is anticipated to begin in early August 2025. Ecology will be notified within 24 hours of completion of the PDI and demobilization from Terminal 5. The PDI will be followed by approximately 4 weeks of laboratory analysis and data validation.

8.2 REPORTING

The results of the PDI will be presented in a memorandum that will be included as an appendix to the EDR. The Agency Review Draft EDR will be submitted to Ecology for review and approval within 60 calendar days following receipt of validated data, with a targeted submittal date of November 2025.

Concurrent with submittal of the Agency Review Draft EDR to Ecology, the PDI validated sediment data will be submitted to Ecology for entry into the EIM database in accordance with WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840: Data Submittal Requirements.

9.0 References

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Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Tables

Table 2.2
2018 to 2022 Site Sediment Total PCBs, Total PAH Results, and PCB Congener Data

					Analyte	Total PCB Aroclors [1]	PCB Congener TEQ [2]	Total PAHs [3]
					SMS Freshwater SCO	110	--	17,000
					Site-Specific CUL	97	--	--
					Unit	µg/kg	µg/kg	µg/kg
Location Name	Sample Name	X Coordinate [4]	Y Coordinate [4]	Sample Date	Sample Interval			
Sediment Grabs								
AV-BVC-05	AV-BVC-05-210816	1069209.4	121961.6	8/16/2021	0–10 cm			270 J
AV-BVC-10	AV-BVC-10-210816	1069309.2	121962.4	8/16/2021	0–10 cm			**29,000 J**
	AV-BVC-110-210816	1069309.2	121962.4	8/16/2021	0–10 cm			**19,000 J**
AV-BVC-11	AV-BVC-11-210816	1069416.3	121907.1	8/16/2021	0–10 cm			41 J
AV-SG-01	AV-SG-01-210813	1070740.1	121398.9	8/13/2021	0–10 cm	45 J		980 J
AV-SG-02	AV-SG-02-210813	1070377.1	121396.3	8/13/2021	0–10 cm	12 U		17 J
AV-SG-03	AV-SG-03-210813	1070308.6	121561.1	8/13/2021	0–10 cm	**240 J**	0.00445	1,600 J
	AV-SG-103-210813	1070308.6	121561.1	8/13/2021	0–10 cm			610 J
AV-SG-04	AV-SG-04-210814	1069902.8	121722.0	8/14/2021	0–10 cm	**110 J**		6.4 J
AV-SG-05	AV-SG-05-210814	1069698.0	121625.4	8/14/2021	0–10 cm	12 U		6.1 U
AV-SG-06	AV-SG-06-210814	1069537.6	121828.8	8/14/2021	0–10 cm	**190 J**	0.00204	750 J
AV-SG-07	AV-SG-07-210814	1069020.7	121903.9	8/14/2021	0–10 cm	20		6.3 U
AV-SG-08	AV-SG-08-210814	1068930.1	122155.7	8/14/2021	0–10 cm	93 J		1,100 J
AV-SG-09	AV-SG-09-210815	1068582.8	122151.8	8/15/2021	0–10 cm	11 J		2.3 J
AV-SG-10	AV-SG-10-210815	1068277.5	122321.3	8/15/2021	0–10 cm	13 U		2.5 J
AV-SG-11	AV-SG-11-210815	1067973.4	122524.4	8/15/2021	0–10 cm	12 U		89 J
	AV-SG-111-210815	1067973.4	122524.4	8/15/2021	0–10 cm	12 U		34 J
AV-SG-12	AV-SG-12-210815	1068079.2	122501.0	8/15/2021	0–10 cm	17 J		24 J
AV-SG-13	AV-SG-13-210815	1068298.6	122433.2	8/15/2021	0–10 cm	20 J		2,700
AV-SG-14	AV-SG-14-210815	1068528.6	122300.6	8/15/2021	0–10 cm	81 J		310 J
AV-SG-14	AV-SG-114-210815	1068528.6	122300.6	8/15/2021	0–10 cm	22 J		420 J
AV-SG-15	AV-SG-15-210814	1068787.1	122119.6	8/14/2021	0–10 cm	38 J		320 J
AV-SG-16	AV-SG-16-210814	1068921.4	121945.5	8/14/2021	0–10 cm	**140 J**		1,000
AV-SG-17	AV-SG-17-210814	1069121.4	121991.7	8/14/2021	0–10 cm	44 J		84 J
AV-SG-18	AV-SG-18-210814	1069191.7	122020.1	8/14/2021	0–10 cm	58 J		38 J
AV-SG-19	AV-SG-19-210814	1069282.5	121907.9	8/14/2021	0–10 cm	28		1,200 J
AV-SG-20	AV-SG-20-210814	1069190.7	121746.0	8/14/2021	0–10 cm	12 U	8.97×10^{-7}	5.7 U
AV-SG-21	AV-SG-21-210815	1069422.7	121788.1	8/15/2021	0–10 cm	**98**		570 J
AV-SG-22	AV-SG-22-210814	1069703.6	121736.6	8/14/2021	0–10 cm	**260 J**		4,100 J
	AV-SG-122-210814	1069703.6	121736.6	8/14/2021	0–10 cm	**560 J**	0.00680	2,200
AV-SG-23	AV-SG-23-210814	1070021.5	121655.6	8/14/2021	0–10 cm	**180**		440 J
AV-SG-25	AV-SG-25-210813	1070451.2	121466.9	8/13/2021	0–10 cm	**3,900 J**	0.0319	520 J
AV-SG-26	AV-SG-26-210813	1070648.5	121343.4	8/13/2021	0–10 cm	89 J		31 J
AV-SG-28	AV-SG-28-210815	1069259.2	121793.1	8/15/2021	0–10 cm	**200 J**		2,500 J
AV-SG-29-2022	AV-SG-29-221112	1068786.8	122211.5	11/12/2022	0–10 cm	75 J	0.00108	
AV-SG-30-2022	AV-SG-30-221112	1068864.5	122158.9	11/12/2022	0–10 cm	**220 J**	0.00946	
AV-SG-31-2022	AV-SG-31-221112	1069523.2	121764.8	11/12/2022	0–10 cm	**190 J**	0.00225	
AV-SG-32-2022	AV-SG-32-221112	1069551.5	121679.8	11/12/2022	0–10 cm	12 U		
	AV-SG-132-221112	1069551.5	121679.8	11/12/2022	0–10 cm	12 U		
AV-SG-33-2022	AV-SG-33-221112	1069628.9	121788.1	11/12/2022	0–10 cm	**400**	0.00189	
AV-SG-34-2022	AV-SG-34-221112	1069948.3	121595.8	11/12/2022	0–10 cm	45	0.0106	
AV-VC-03-2022	AV-VC-03-221112	1069435.4	121817.3	11/12/2022	0–10 cm	42 J		
FP-01-SG	FP-01-SG-0-10-063021	1069274.2	121871.9	6/30/2021	0–10 cm	**180 J**		2,200 J
FP-01-SG-2022	FP-01-SG-0-10-051622	1069291.5	121871.0	5/16/2022	0–10 cm	80 J		**51,000 J**
FP-02-SG	FP-02-SG-0-10-063021	1069217.0	121902.5	6/30/2021	0–10 cm	2.5		500 J
FP-02-SG	FP-102-SG-0-10-063021	1069217.0	121902.5	6/30/2021	0–10 cm	9.9 J		3,600 J
FP-02-SG-2022	FP-02-SG-0-10-051722	1069210.1	121903.2	5/17/2022	0–10 cm	13 J		330 J
FP-03-SG	FP-03-SG-0-10-063021	1069168.6	121923.6	6/30/2021	0–10 cm	8.2 J		57
FP-03-SG-2022	FP-03-SG-0-10-051722	1069170.6	121928.7	5/17/2022	0–10 cm	8.2 J		52 J
FP-04-SG	FP-04-SG-0-10-063021	1069060.5	121966.4	6/30/2021	0–10 cm	32 J		880 J
FP-04-SG-2022	FP-04-SG-0-10-051622	1069063.5	121975.3	5/16/2022	0–10 cm	3.7 J		320 J
FP-05-SG	FP-05-SG-0-10-063021	1068993.8	121999.8	6/30/2021	0–10 cm	28 J		32 J
FP-05-SG-2022	FP-05-SG-0-10-051722	1068999.4	122000.3	5/17/2022	0–10 cm	40 J		170 J
FP-06-SG	FP-06-SG-0-10-063021	1068948.3	122019.6	6/30/2021	0–10 cm	11 J		120 J
FP-06-SG-2022	FP-06-SG-0-10-051622	1068952.9	122025.3	5/16/2022	0–10 cm	9.7 J		60 J
OSG-01	OSG-01-0-09-051622	1069802.6	121730.3	5/16/2022	0–9 cm	**1,600**		840 J
OSG-02	OSG-02-0-10-051622	1069761.0	121622.0	5/16/2022	0–10 cm	2.4 U		5.6 U
	OSG-102-0-10-051622	1069761.0	121622.0	5/16/2022	0–10 cm	50 J		5.6 U
OSG-03	OSG-03-0-10-051622	1069874.8	121582.2	5/16/2022	0–10 cm	9.8 J		5.8 U
OSG-04	OSG-04-0-10-051622	1069992.0	121546.1	5/16/2022	0–10 cm	**160 J**		10 J
OSG-05	OSG-05-0-09-051622	1070115.4	121507.0	5/16/2022	0–9 cm	**1,800**		**34,000 J**
OSG-06	OSG-06-0-10-051722	1070313.4	121420.3	5/17/2022	0–10 cm	2.3 U		5.4 U
OSG-07	OSG-07-0-09-051722	1070359.2	121504.6	5/17/2022	0–9 cm	40 J		230 J
OSG-08	OSG-08-0-10-051722	1070452.1	121363.6	5/17/2022	0–10 cm	2.2 U		5.6 U
OSG-09	OSG-09-0-10-051722	1070607.8	121414.7	5/17/2022	0–10 cm	**1,400**		830 J
OSG-10	OSG-10-0-10-051722	1070572.9	121337.2	5/17/2022	0–10 cm	2.4 U		6.8 J
OSG-11	OSG-11-0-10-051722	1070694.9	121283.6	5/17/2022	0–10 cm	2.6 U		6.1 U
OSG-12	OSG-12-0-10-051922	1070245.4	121455.6	5/19/2022	0–10 cm	64 J		8.7 J
OSG-13	OSG-13-0-10-051922	1069903.4	121641.0	5/19/2022	0–10 cm	42 J		72 J
OSG-14	OSG-14-0-10-051922	1070023.0	121668.9	5/19/2022	0–10 cm	59 J		1,800 J
OSG-15	OSG-15-0-10-051922	1070136.1	121602.0	5/19/2022	0–10 cm	75 J		160 J
OSG-16	OSG-16-0-10-051922	1070257.4	121573.5	5/19/2022	0–10 cm	**4,600 J**		**35,000 J**
OSG-17	OSG-17-0-10-051922	1070484.4	121479.4	5/19/2022	0–10 cm	**2,000 J**		91 J
OSG-18	OSG-18-0-10-051922	1070704.3	121379.2	5/19/2022	0–10 cm	5.6 U		7.1 U
RSG-01	RSG-01-0-10-051622	1069469.8	121872.4	5/16/2022	0–10 cm	29 J		4,200 J
RSG-02	RSG-02-0-10-051922	1069622.0	121792.6	5/19/2022	0–10 cm	**510 J**		1,200 J
SG-01	SG-01-0-10-070919	1068886.4	122159.7	7/9/2019	0–10 cm	**310 J**	0.00171	920
SG-02	SG-02-0-10-070919	1069261.9	121803.3	7/9/2019	0–10 cm	73 J		**63,000**
	SG-102-0-10-070919	1069261.9	121803.3	7/9/2019	0–10 cm	37		390
SG-03	SG-03-0-10-070919	1069679.0	121640.4	7/9/2019	0–10 cm	14		6.5 U
SG-04	SG-04-0-10-070919	1070208.8	121556.1	7/9/2019	0–10 cm	**220**		48
SG-05	SG-05-0-10-070919	1070484.7	121449.5	7/9/2019	0–10 cm	28		56
SG-06	SG-06-0-10-070919	1068366.8	122387.9	7/9/2019	0–10 cm	14 U		30

Table 2.2
2018 to 2022 Site Sediment Total PCBs, Total PAH Results, and PCB Congener Data

					Analyte	Total PCB Aroclors [1]	PCB Congener TEQ [2]	Total PAHs [3]
					SMS Freshwater SCO	110	--	17,000
					Site-Specific CUL	97	--	--
					Unit	µg/kg	µg/kg	µg/kg
Location Name	**Sample Name**	**X Coordinate [4]**	**Y Coordinate [4]**	**Sample Date**	**Sample Interval**			
Sediment Cores								
AV-VC-01	AV-VC-01-000-005-210813	1070204.2	121566.2	8/13/2021	0–0.5 ft			2,100 J
	AV-VC-01-005-010-210813	1070204.2	121566.2	8/13/2021	0.5–1 ft			150 J
	AV-VC-01-010-015-210813	1070204.2	121566.2	8/13/2021	1–1.5 ft			170 J
	AV-VC-01-015-020-210813	1070204.2	121566.2	8/13/2021	1.5–2 ft			67 J
	AV-VC-01-025-030-210813	1070204.2	121566.2	8/13/2021	2.5–3 ft	53 J		
AV-VC-02	AV-VC-02-000-005-210812	1069681.4	121734.1	8/12/2021	0–0.5 ft			540 J
	AV-VC-02-005-010-210812	1069681.4	121734.1	8/12/2021	0.5–1 ft			210 J
	AV-VC-02-010-015-210812	1069681.4	121734.1	8/12/2021	1–1.5 ft			160 J
	AV-VC-02-015-020-210812	1069681.4	121734.1	8/12/2021	1.5–2 ft			19 J
	AV-VC-02-025-030-210812	1069681.4	121734.1	8/12/2021	2.5–3 ft	13 U		
AV-VC-03	AV-VC-03-000-005-210810	1069437.6	121814.9	8/10/2021	0–0.5 ft			**110,000 J**
	AV-VC-03-005-010-210810	1069437.6	121814.9	8/10/2021	0.5–1 ft			5,700 J
	AV-VC-03-010-015-210810	1069437.6	121814.9	8/10/2021	1–1.5 ft			6,200 J
	AV-VC-03-015-020-210810	1069437.6	121814.9	8/10/2021	1.5–2 ft			3,900 J
AV-VC-04	AV-VC-04-000-005-210811	1069244.0	121873.3	8/11/2021	0–0.5 ft			1,400 J
	AV-VC-04-005-010-210811	1069244.0	121873.3	8/11/2021	0.5–1 ft			510 J
	AV-VC-04-010-015-210811	1069244.0	121873.3	8/11/2021	1–1.5 ft			1,100 J
	AV-VC-04-015-020-210811	1069244.0	121873.3	8/11/2021	1.5–2 ft			1,600 J
AV-VC-04-2022	AV-VC-04-000-005-221112	1069233.8	121881.9	11/12/2022	0–0.5 ft	**150 J**		
	AV-VC-04-005-010-221112	1069233.8	121881.9	11/12/2022	0.5–1 ft	**99 J**		
	AV-VC-04-010-015-221112	1069233.8	121881.9	11/12/2022	1–1.5 ft	**200 J**		
	AV-VC-04-015-020-221112	1069233.8	121881.9	11/12/2022	1.5–2 ft	**100 J**		
	AV-VC-04-020-025-221112	1069233.8	121881.9	11/12/2022	2–2.5 ft	**120 J**		
	AV-VC-04-025-030-221112	1069233.8	121881.9	11/12/2022	2.5–3 ft	**260 J**		
	AV-VC-04-030-035-221112	1069233.8	121881.9	11/12/2022	3–3.5 ft	**3,400 J**		
AV-VC-05	AV-VC-05-000-005-210810	1069214.9	121959.4	8/10/2021	0–0.5 ft			2,400 J
	AV-VC-05-005-010-210810	1069214.9	121959.4	8/10/2021	0.5–1 ft			590 J
	AV-VC-05-010-015-210810	1069214.9	121959.4	8/10/2021	1–1.5 ft			760 J
	AV-VC-05-015-020-210810	1069214.9	121959.4	8/10/2021	1.5–2 ft			380 J
AV-VC-05-2022	AV-VC-05-000-005-221108	1069222.1	121967.2	11/8/2022	0–0.5 ft	**380 J**		
	AV-VC-05-005-010-221108	1069222.1	121967.2	11/8/2022	0.5–1 ft	87 J		
	AV-VC-05-010-015-221108	1069222.1	121967.2	11/8/2022	1–1.5 ft	56 J		
	AV-VC-05-015-020-221108	1069222.1	121967.2	11/8/2022	1.5–2 ft	28 J		
AV-VC-06-2022	AV-VC-06-000-005-221108	1069035.1	122021.2	11/8/2022	0–0.5 ft	24 J		
	AV-VC-06-005-010-221108	1069035.1	122021.2	11/8/2022	0.5–1 ft	19 J		
	AV-VC-06-010-015-221108	1069035.1	122021.2	11/8/2022	1–1.5 ft	32 J		
	AV-VC-06-015-020-221108	1069035.1	122021.2	11/8/2022	1.5–2 ft	39 J		
AV-VC-07	AV-VC-07-000-005-210812	1068692.2	122266.6	8/12/2021	0–0.5 ft			510 J
	AV-VC-07-005-010-210812	1068692.2	122266.6	8/12/2021	0.5–1 ft			720 J
	AV-VC-07-010-015-210812	1068692.2	122266.6	8/12/2021	1–1.5 ft			510 J
	AV-VC-07-015-020-210812	1068692.2	122266.6	8/12/2021	1.5–2 ft			**41,000 J**
	AV-VC-07-025-030-210812	1068692.2	122266.6	8/12/2021	2.5–3 ft	23 J		
AV-VC-07-2022	AV-VC-07-000-005-221109	1068698.3	122253.7	11/9/2022	0–0.5 ft	56 J		
	AV-VC-07-005-010-221109	1068698.3	122253.7	11/9/2022	0.5–1 ft	**220 J**		
	AV-VC-07-010-015-221109	1068698.3	122253.7	11/9/2022	1–1.5 ft	**1,300 J**		
	AV-VC-07-015-020-221109	1068698.3	122253.7	11/9/2022	1.5–2 ft	**140 J**		
	AV-VC-1007-015-020-221109	1068698.3	122253.7	11/9/2022	1.5–2 ft	**120 J**		
	AV-VC-07-020-025-221109	1068698.3	122253.7	11/9/2022	2–2.5 ft	19 J		
AV-VC-08-2022	AV-VC-08-000-005-221109	1068852.7	122181.9	11/9/2022	0–0.5 ft	**380 J**		
	AV-VC-08-005-010-221109	1068852.7	122181.9	11/9/2022	0.5–1 ft	**340 J**		
	AV-VC-08-010-015-221109	1068852.7	122181.9	11/9/2022	1–1.5 ft	**470 J**		
AV-VC-09-2022	AV-VC-09-000-005-221109	1069118.1	122064.2	11/9/2022	0–0.5 ft	79 J		
	AV-VC-09-005-010-221109	1069118.1	122064.2	11/9/2022	0.5–1 ft	65 J		
	AV-VC-09-010-015-221109	1069118.1	122064.2	11/9/2022	1–1.5 ft	96 J		
	AV-VC-09-015-020-221109	1069118.1	122064.2	11/9/2022	1.5–2 ft	23 J		
AV-VC-10	AV-VC-10-000-005-210810	1069299.4	121965.9	8/10/2021	0–0.5 ft			16,000 J
	AV-VC-10-005-010-210810	1069299.4	121965.9	8/10/2021	0.5–1 ft			8,800 J
	AV-VC-10-010-015-210810	1069299.4	121965.9	8/10/2021	1–1.5 ft			**18,000 J**
	AV-VC-10-015-020-210810	1069299.4	121965.9	8/10/2021	1.5–2 ft			**48,000 J**
AV-VC-10-2022	AV-VC-10-000-005-221110	1069301.4	121963.6	11/10/2022	0–0.5 ft	53		
	AV-VC-10-005-011-221110	1069301.4	121963.6	11/10/2022	0.5–1.1 ft	**210 J**		
	AV-VC-1010-005-011-221110	1069301.4	121963.6	11/10/2022	0.5–1.1 ft	**220 J**		
AV-VC-11	AV-VC-11-000-005-210812	1069406.9	121907.5	8/12/2021	0–0.5 ft			180 J
	AV-VC-11-005-010-210812	1069406.9	121907.5	8/12/2021	0.5–1 ft			230 J
	AV-VC-11-010-015-210812	1069406.9	121907.5	8/12/2021	1–1.5 ft			100 J
	AV-VC-11-015-020-210812	1069406.9	121907.5	8/12/2021	1.5–2 ft			320 J
AV-VC-11-2022	AV-VC-11-000-005-221110	1069415.6	121915.8	11/10/2022	0–0.5 ft	**220 J**		
	AV-VC-11-005-010-221110	1069415.6	121915.8	11/10/2022	0.5–1 ft	11 J		
	AV-VC-11-010-015-221110	1069415.6	121915.8	11/10/2022	1–1.5 ft	15		
	AV-VC-11-015-020-221110	1069415.6	121915.8	11/10/2022	1.5–2 ft	25		
AV-VC-12-2022	AV-VC-12-000-005-221110	1069611.2	121778.7	11/10/2022	0–0.5 ft	**1,600**		
	AV-VC-12-005-010-221110	1069611.2	121778.7	11/10/2022	0.5–1 ft	14 U		
	AV-VC-12-010-015-221110	1069611.2	121778.7	11/10/2022	1–1.5 ft	13 U		
	AV-VC-12-015-020-221110	1069611.2	121778.7	11/10/2022	1.5–2 ft	13 U		
AV-VC-13-2022	AV-VC-13-000-005-221110	1069795.5	121726.9	11/10/2022	0–0.5 ft	11 J		
	AV-VC-13-005-010-221110	1069795.5	121726.9	11/10/2022	0.5–1 ft	13 U		
	AV-VC-13-010-015-221110	1069795.5	121726.9	11/10/2022	1–1.5 ft	14 U		
	AV-VC-1013-010-015-221110	1069795.5	121726.9	11/10/2022	1–1.5 ft	13 U		
	AV-VC-13-015-020-221110	1069795.5	121726.9	11/10/2022	1.5–2 ft	14 U		
	AV-VC-13-020-025-221110	1069795.5	121726.9	11/10/2022	2–2.5 ft	14 U		
	AV-VC-13-025-030-221110	1069795.5	121726.9	11/10/2022	2.5–3 ft	13 U		
	AV-VC-13-030-035-221110	1069795.5	121726.9	11/10/2022	3–3.5 ft	14 U		

Table 2.2
2018 to 2022 Site Sediment Total PCBs, Total PAH Results, and PCB Congener Data

					Analyte	Total PCB Aroclors [1]	PCB Congener TEQ [2]	Total PAHs [3]
					SMS Freshwater SCO	110	--	17,000
					Site-Specific CUL	97	--	--
					Unit	µg/kg	µg/kg	µg/kg
Location Name	**Sample Name**	**X Coordinate [4]**	**Y Coordinate [4]**	**Sample Date**	**Sample Interval**			
Sediment Cores (cont.)								
AV-VC-14-2022	AV-VC-14-000-005-221111	1070135.0	121498.2	11/11/2022	0–0.5 ft	**4,700 J**		
	AV-VC-14-005-010-221111	1070135.0	121498.2	11/11/2022	0.5–1 ft	**520 J**		
	AV-VC-14-010-015-221111	1070135.0	121498.2	11/11/2022	1–1.5 ft	**1,600 J**		
	AV-VC-14-015-020-221111	1070135.0	121498.2	11/11/2022	1.5–2 ft	**1,000 J**		
	AV-VC-14-020-025-221111	1070135.0	121498.2	11/11/2022	2–2.5 ft	**420 J**		
	AV-VC-14-025-029-221111	1070135.0	121498.2	11/11/2022	2.5–2.9 ft	**130 J**		
AV-VC-15-2022	AV-VC-15-000-005-221111	1070241.6	121561.2	11/11/2022	0–0.5 ft	**18,000 J**		
	AV-VC-15-005-010-221111	1070241.6	121561.2	11/11/2022	0.5–1 ft	**400 J**		
	AV-VC-1015-005-010-221111	1070241.6	121561.2	11/11/2022	0.5–1 ft	**220 J**		
	AV-VC-15-010-015-221111	1070241.6	121561.2	11/11/2022	1–1.5 ft	22 J		
	AV-VC-15-015-018-221111	1070241.6	121561.2	11/11/2022	1.5–1.8 ft	**140 J**		
AV-VC-16-2022	AV-VC-16-000-005-221111	1070461.2	121479.5	11/11/2022	0–0.5 ft	70 J		
	AV-VC-16-005-010-221111	1070461.2	121479.5	11/11/2022	0.5–1 ft	40 J		
	AV-VC-16-010-015-221111	1070461.2	121479.5	11/11/2022	1–1.5 ft	21 J		
	AV-VC-16-015-020-221111	1070461.2	121479.5	11/11/2022	1.5–2 ft	39 J		
AV-VC-17-2022	AV-VC-17-000-005-221112	1070619.2	121419.7	11/12/2022	0–0.5 ft	**1,300 J**		
	AV-VC-17-005-010-221112	1070619.2	121419.7	11/12/2022	0.5–1 ft	**260 J**		
	AV-VC-17-010-015-221112	1070619.2	121419.7	11/12/2022	1–1.5 ft	**840 J**		
	AV-VC-17-015-020-221112	1070619.2	121419.7	11/12/2022	1.5–2 ft	**330 J**		
	AV-VC-17-020-025-221112	1070619.2	121419.7	11/12/2022	2–2.5 ft	**580 J**		
	AV-VC-17-025-030-221112	1070619.2	121419.7	11/12/2022	2.5–3 ft	**3,800 J**		
	AV-VC-17-030-036-221112	1070619.2	121419.7	11/12/2022	3–3.6 ft	**2,500 J**		
B17A-SC-1	B17A-SC1-A	1069123.3	121949.7	12/19/2018	0–2 ft	**200 J**		
	B17A-SC1-B	1069123.3	121949.7	12/19/2018	2–3.2 ft	13 U		210 J
B17A-SC-2	B17A-SC2-A	1069252.2	121895.4	12/19/2018	0–0.7 ft	**530 J**		
B17A-SC-C1	B17A-SC-C1	1069187.8	121922.6	12/19/2018	0–3.2 ft	**200 J**		1,300 J
	B17A-SC-C21	1069187.8	121922.6	12/19/2018	0–3.2 ft	**290 J**		2,800 J
B17B-SC-C1	B17B-SC-C1	1069464.6	121801.8	12/17/2018	0–1.1 ft	**490 J**		9,900 J
FP-01-VC	FP-01-VC-0.0-0.5-070221	1069273.6	121874.4	7/2/2021	0–0.5 ft	**500 J**		1,300 J
	FP-01-VC-0.5-1.0-070221	1069273.6	121874.4	7/2/2021	0.5–1 ft	**410 J**		1,200 J
	FP-01-VC-1.0-1.5-070221	1069273.6	121874.4	7/2/2021	1–1.5 ft	**210 J**		1,400 J
	FP-101-VC-1.0-1.5-070221	1069273.6	121874.4	7/2/2021	1–1.5 ft	**240 J**		1,200 J
	FP-01-VC-1.5-2.0-070221	1069273.6	121874.4	7/2/2021	1.5–2 ft	**310 J**		
	FP-01-VC-2.0-2.4-070221	1069273.6	121874.4	7/2/2021	2–2.4 ft	**320 J**		
FP-02-VC	FP-02-VC-0.0-0.5-070121	1069217.3	121903.3	7/1/2021	0–0.5 ft	11 J		180 J
	FP-02-VC-0.5-1.0-070121	1069217.3	121903.3	7/1/2021	0.5–1 ft	32 J		110 J
	FP-02-VC-1.0-1.5-070121	1069217.3	121903.3	7/1/2021	1–1.5 ft	16 J		58 J
FP-04-VC	FP-04-VC-0.0-0.5-070221	1069080.9	121964.1	7/2/2021	0–0.5 ft	24 J		220 J
	FP-04-VC-0.5-1.0-070221	1069080.9	121964.1	7/2/2021	0.5–1 ft	9.7 J		50 J
	FP-04-VC-1.0-1.5-070221	1069080.9	121964.1	7/2/2021	1–1.5 ft	35		28 J
FP-06-VC	FP-06-VC-0.0-0.5-070121	1068951.3	122021.5	7/1/2021	0–0.5 ft	**240 J**		230 J
	FP-06-VC-0.5-1.0-070121	1068951.3	122021.5	7/1/2021	0.5–1 ft	50 J		48 J
	FP-06-VC-1.0-1.5-070121	1068951.3	122021.5	7/1/2021	1–1.5 ft	21 J		43 J
RVC-01	RVC-01-0.0-0.5	1068782.3	122160.4	5/18/2022	0–0.5 ft	**110 J**		120 J
	RVC-01-0.5-1.0	1068782.3	122160.4	5/18/2022	0.5–1 ft	37 J		5.8 U
RVC-02	RVC-02-0.0-0.5	1068867.9	122088.3	5/18/2022	0–0.5 ft	17 J		14 J
	RVC-02-0.5-1.0	1068867.9	122088.3	5/18/2022	0.5–1 ft	53 J		460 J
	RVC-102-0.5-1.0	1068867.9	122088.3	5/18/2022	0.5–1 ft	39 J		130 J
Slough-1	Slough-1-0-2	1069161.9	121965.6	12/18/2018	0–2 ft	53		1,000 J
Slough-2	Slough-2-0-0.9	1069405.4	121836.9	12/19/2018	0–0.9 ft	**1,100**		**30,000 J**
VC-01	VC-01-0-2-071219	1068042.0	122439.8	7/12/2019	0–2 ft	12 U		790
VC-02	VC-02-0-2-071119	1068355.9	122382.7	7/11/2019	0–2 ft	12 U		27
VC-03	VC-03-0-2-071119	1068653.6	122217.4	7/11/2019	0–2 ft	34		300
VC-04	VC-04-0-2-071219	1069110.0	121952.8	7/12/2019	0–2 ft	11 U		230
VC-05	VC-05-0-1.7-071119	1069388.5	121875.6	7/11/2019	0–1.7 ft	63		2,300
VC-06	VC-06-0-2-071119	1069525.1	121763.3	7/11/2019	0–2 ft	**230**		4,300
	VC-06-2-3.8-071119	1069525.1	121763.3	7/11/2019	2–3.8 ft	15 J		
VC-07	VC-07-0-2-071119	1069707.8	121737.0	7/11/2019	0–2 ft	**1,500 J**	9.52×10^{-5}	220
	VC-07-2-4-071119	1069707.8	121737.0	7/11/2019	2–4 ft	13 U		
VC-08	VC-08-0-2-071119	1070028.3	121577.7	7/11/2019	0–2 ft	22		880 J

Notes:

All results rounded to two significant figures, except for PCB congeners, which are rounded to three. Blank results indicate sample was not analyzed for that analyte.

-- Not established.

RED/BOLD Analyte was detected at a concentration greater than the site-specific CUL.

RED/BOLD Analyte was detected at a concentration greater than the SMS Freshwater SCO.

1 Total PCB Aroclors is the sum of detected concentrations of Aroclors 1016, 1221, 1242, 1248, 1254, 1260, and 1268. Non-detected results for individual analytes are excluded from the sum. If no analytes in the sum are detected above the reporting limit, the summed result is reported as not detected at the greatest reporting limit from among the individual analytes.

2 The PCB congener TEQ is the sum of detected concentrations of 12 individual PCB congeners (coeluting congeners are reported as a single result) multiplied by their respective TEFs. TEFs are provided in Ecology guidance (2021). Non-detected results for individual analytes are excluded from the sum. The total PCB congener TEQ values reported in this table are slightly lower than the values reported in the Final Periodic Review Data Report (Anchor QEA 2024) because the TEF for PCB-123 was updated from 0.0003 µg/kg to 0.00003 µg/kg, per Ecology guidance (2021).

3 Total PAHs is the sum of detected concentrations of acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. Non-detected results for individual analytes are excluded from the sum. If no analytes in the sum are detected above the reporting limit, the summed result is reported as not detected at the greatest reporting limit from among the individual analytes.

4 X and Y coordinates are in North American Datum of 1983 National Adjustment of 2011, State Plane Coordinate System Washington South Zone (EPSG 2286), U.S. Feet.

Abbreviations:

cm Centimeters
CUL Cleanup level
EPSG European Petroleum Survey Group
ft Feet
µg/kg Micrograms per kilogram
PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
SCO Sediment Cleanup Objective
SMS Sediment Management Standards
TEF Toxicity equivalency factor
TEQ Toxic equivalent

Qualifiers:

J Analyte was detected; concentration is an estimate.
U Analyte was not detected at the associated reporting limit.

Table 6.1
Data Quality Objectives

Step 1: State the Problem	Step 2: Identify the Goals of the Study	Step 3: Identify Information Inputs	Step 4: Define the Boundaries of the Study	Step 5: Develop the Analytical Approach	Step 6: Specify the Performance or Acceptance Criteria	Step 7: Develop the Plan for Obtaining Data
Data Quality Objective (DQO) 1: Further Delineate the Vertical Extent of Contamination for Remedial Design						
Additional subsurface sediment (core) data are needed to further delineate the vertical extent of total polychlorinated biphenyls (PCB) and total polycyclic aromatic hydrocarbons (PAHs) contamination on a point-by-point basis and subsurface interpolation basis to inform depth of dredging for remedial design to achieve compliance with the total PCB surface area–weighted average concentration (SWAC) cleanup level.	• Identify the vertical extent of PCB and PAH exceedances in areas where data gaps exist in the current Terminal 5 Alcoa Vancouver Site (Site) dataset. • Collect sufficient vertical data to define necessary dredge depths and to inform Engineering Design Report development of dredge units to remove all exceedances of Interim Action cleanup criteria, as feasible. • Collect sufficient vertical data to identify any areas where the vertical extent of contamination may exceed project criteria at depth, but Site constraints prohibit achieving full removal of this sediment (e.g., adjacent to a structure), requiring evaluation of partial removal and/or armored capping.	• Current dataset, including subsurface sediment data collected since 2018 and information about the nature, location, and magnitude of Interim Action cleanup criteria exceedances are presented on Figures 6.1–6.3 and in Table 2.2. • Historical data documented in the Remedial Investigation/Feasibility Study (Table 2.6 and Appendix C) show that prior to the 2008–2009 remedial action, subsurface exceedances of Interim Action cleanup criteria were generally bounded within 2 to 3 feet of the mudline, except in the immediate vicinity of the Clark County Public Utilities (CPU) outfall, where these exceedances were unbounded at three locations, at 2, 3, and 6 feet below mudline, respectively. • The 2008–2009 cleanup included dredging to depths between 0.5 and 3.5 feet, with the deeper dredge extents focused around the CPU outfall, based on the approximate depth of contamination as it was understood at the time.	• The Site is depicted on Figure 1.1. Proposed sediment core sample locations are depicted on Figures 6.1–6.3 and tabulated in Table 6.1. • Accessibility for sampling equipment and personnel will be considered under this DQO.	• Sediment vibracore samples will be analyzed to determine lateral and vertical extent of total PCB and total PAH exceedances to fill existing data gaps. The analytical schedule for each sample is presented in Table A.1 of the Field Sampling Plan in Appendix A. Total PCBs will be analyzed in all samples. Total PAHs will be analyzed in samples where existing sediment data show unbounded (laterally or vertically) total PAH exceedances. • Select step-out core locations have been identified where there is greater uncertainty about the lateral extents of sediment contamination, particularly in the subsurface, that will enhance vertical delineation as well. Samples from these locations will be archived at the laboratory for potential follow-up analysis if results from adjacent cores indicate additional lateral delineation is necessary to achieve this DQO. These locations to be archived are noted in Table A.1 and are generally located around the outer extents of the existing data dataset.	• Field sample acceptance criteria are described in the Field Sampling Plan (Appendix A). • Laboratory result acceptance criteria are described in the Quality Assurance Project Plan (QAPP; Appendix B).	• The proposed sediment sampling plan is described in Section 6 and Table 6.1 and the Field Sampling Plan (Appendix A). • Laboratory analyses are described in the QAPP (Appendix B).

Table 6.1
Data Quality Objectives

Step 1: State the Problem	Step 2: Identify the Goals of the Study	Step 3: Identify Information Inputs	Step 4: Define the Boundaries of the Study	Step 5: Develop the Analytical Approach	Step 6: Specify the Performance or Acceptance Criteria	Step 7: Develop the Plan for Obtaining Data
DQO 2: Further Delineate the Horizontal Extent of Contamination for Remedial Design						
Additional surface sediment (grab) data are needed to refine the lateral extent of freshwater sediment cleanup objective criteria exceedances and support achieving compliance with the total PCB SWAC cleanup level.	• Identify the lateral extent of total PCB and total PAH exceedances in areas where data gaps exist in the current Site dataset. • Refine the boundaries of the perspective dredge prisms at the surface where existing data do not provide sufficient resolution for remedial design.	• Current dataset, including subsurface sediment data collected since 2018, and information about the nature, location, and magnitude of Interim Action cleanup criteria exceedances are presented on Figures 6.1–6.3 and in Table 2.2.	• The Site is depicted on Figure 1.1. Proposed sediment surface grab sample locations are depicted on Figures 6.1–6.3 and tabulated in Table 6.2. • Accessibility for sampling equipment and personnel will be considered under this DQO.	• Sediment grab samples will be analyzed to determine lateral extent of total PCB and total PAH exceedances to fill existing data gaps. The analytical schedule for each sample is presented in Table A.1 of the Field Sampling Plan in Appendix A. Total PCBs will be analyzed in all samples. Total PAHs will be analyzed in samples where existing sediment data show unbounded (laterally) total PAH exceedances.	• Field sample acceptance criteria are described in the Field Sampling Plan (Appendix A). • Laboratory result acceptance criteria are described in the QAPP (Appendix B).	• The proposed sediment sampling plan is described in Section 6 and Table 6.1 and the Field Sampling Plan (Appendix A). • Laboratory analyses are described in the QAPP (Appendix B).
DQO 3: Conduct Bulk Sediment and Water Treatability Studies for Dredge Material Management and Water Treatment						
Additional data are needed to do the following: • Characterize sediment physical parameters. • Inform design of a dredge return water treatment system. • Evaluate dredge material properties for handling and transport during construction.	• Collect additional grain size data from within the presumptive dredge prisms, particularly from subsurface sediments. • Collect bulk sediment and surface water samples that are representative of the presumptive dredge volume to perform treatability testing, including dredging elutriate tests (DRETs) and jar tests to evaluate potential contaminant of concern concentrations and other water quality parameters in decant water and coagulant dose rates for dredge return water treatment design. • Evaluate physical aspects bulk sediment for material handling and disposal considerations in remedial design.	• Existing surface sediment grain size data are presented in the Final Periodic Review Data Report (Anchor QEA 2024; Table 6a and Figure 3). • Existing sediment total PCBs and total PAHs data, which are indicative of presumptive dredging areas, are presented on Figures 6.1–6.3 and in Table 2.2.	• The Project Area is depicted on Figure 1.1. Proposed sediment sample locations are depicted on Figures 6.1a and 6.1b. • Accessibility for sampling equipment and personnel will be considered under this DQO.	• Grain size and total organic carbon analyses will be performed on samples as noted on Table A.1 of the Field Sampling Plan in Appendix A. • Sediment material will be collected and composited into three bulk sediment samples representative of the upstream, central, and downstream areas of the Site. • A representative bulk Site surface water sample will be collected from the water column. • The composite bulk sediment samples will be analyzed for total PCBs, total PAHs, total solids, and grain size. • The bulk surface water sample will be analyzed for total PCBs, total PAHs, total suspended solids, and several conventional water quality parameters. DRET elutriate and jar test supernatant will be analyzed for a subset of these parameters. • Bench testing of bulk sediment for evaluation of material handling and disposal.	• Field sample acceptance criteria are described in the Field Sampling Plan (Appendix A). • U.S. Army Corps of Engineers-based DRET protocol and analyses of bulk sediment, surface water, and DRET elutriate are described in the QAPP (Appendix B).	• The proposed bulk sediment/surface water analyses, DRET, and jar testing is described in Section 6.3 and the Field Sampling Plan (Appendix A). • Laboratory analyses are described in the QAPP (Appendix B).

Table 6.2
Proposed PDI Sampling Locations

Location Name	Sample Type	Core Depth (feet)	X Coordinate [1]	Y Coordinate [1]	Notes [2]
PDI-01-C	Core	8	1070721.3	121390.0	Archive
PDI-02-C	Core	8	1070651.1	121344.1	Archive
PDI-03-C	Core	8	1070659.3	121404.4	
PDI-03-SG	Grab	--	1070659.3	121404.4	
PDI-04-C	Core	8	1070592.3	121376.2	
PDI-04-SG	Grab	--	1070592.3	121376.2	
PDI-05-C	Core	8	1070613.6	121417.3	
PDI-06-C	Core	8	1070618.2	121473.2	
PDI-07-SG	Grab	--	1070525.0	121507.0	
PDI-08-C	Core	8	1070537.8	121447.9	
PDI-09-SG	Grab	--	1070501.0	121395.9	
PDI-10-SG	Grab	--	1070409.4	121432.3	
PDI-11-C	Core	6	1070403.4	121549.2	
PDI-11-SG	Grab	--	1070403.4	121549.2	
PDI-12-C	Core	6	1070345.8	121484.2	
PDI-13-C	Core	6	1070264.5	121513.6	
PDI-13-SG	Grab	--	1070264.5	121513.6	
PDI-14-C	Core	6	1070244.7	121578.3	
PDI-15-SG	Grab	--	1070190.8	121612.4	
PDI-16-C	Core	8	1070179.8	121480.2	
PDI-16-SG	Grab	--	1070179.8	121480.2	
PDI-17-C	Core	8	1070163.9	121440.3	Archive
PDI-18-C	Core	8	1070097.2	121421.7	Archive
PDI-19-C	Core	8	1070116.4	121458.4	
PDI-19-SG	Grab	--	1070116.4	121458.4	
PDI-20-C	Core	8	1070066.9	121478.6	Archive
PDI-21-C	Core	8	1070076.1	121524.5	
PDI-21-SG	Grab	--	1070076.1	121524.5	
PDI-22-C	Core	8	1070175.8	121522.9	
PDI-23-C	Core	8	1070116.5	121562.3	
PDI-24-SG	Grab	--	1070076.6	121636.1	
PDI-25-C	Core	6	1070030.8	121646.4	
PDI-26-SG	Grab	--	1070015.9	121605.4	
PDI-27-SG	Grab	--	1069972.6	121504.6	
PDI-28-SG	Grab	--	1069934.9	121555.6	
PDI-29-SG	Grab	--	1069975.4	121650.3	
PDI-30-C	Core	6	1069850.9	121619.9	Archive
PDI-31-SG	Grab	--	1069850.4	121684.2	
PDI-32-SG	Grab	--	1069810.9	121765.8	
PDI-33-SG	Grab	--	1069780.2	121678.7	
PDI-34-C	Core	6	1069684.7	121628.9	Archive
PDI-35-C	Core	6	1069693.2	121694.5	
PDI-35-SG	Grab	--	1069693.2	121694.5	
PDI-36-C	Core	4	1069694.2	121754.0	
PDI-37-SG	Grab	--	1069678.7	121801.3	
PDI-38-SG	Grab	--	1069592.2	121739.1	
PDI-39-SG	Grab	--	1069475.9	121729.7	
PDI-40-SG	Grab	--	1069488.5	121836.1	
PDI-41-SG	Grab	--	1069433.1	121883.8	
PDI-42-C	Core	8	1069435.3	121820.2	
PDI-43-C	Core	8	1069389.1	121766.0	Archive
PDI-44-C	Core	8	1069363.2	121827.9	
PDI-44-SG	Grab	--	1069363.2	121827.9	
PDI-45-SG	Grab	--	1069376.4	121910.2	
PDI-46-C	Core	8	1069341.7	121880.1	
PDI-47-C	Core	8	1069311.3	121871.3	
PDI-48-SG	Grab	--	1069271.7	121833.2	
PDI-49-SG	Grab	--	1069288.2	121783.6	
PDI-50-C	Core	6	1069260.7	121798.3	
PDI-51-SG	Grab	--	1069229.0	121775.8	
PDI-52-SG	Grab	--	1069225.0	121834.2	
PDI-53-C	Core	8	1069224.0	121875.4	
PDI-54-C	Core	8	1069295.3	121974.7	
PDI-55-SG	Grab	--	1069244.0	121995.5	
PDI-56-C	Core	8	1069150.0	121934.4	
PDI-57-C	Core	8	1069143.1	121898.7	
PDI-58-SG	Grab	--	1068956.5	121953.4	
PDI-59-C	Core	6	1068917.9	121936.3	
PDI-60-SG	Grab	--	1068905.9	121919.4	
PDI-61-SG	Grab	--	1068886.8	121951.3	
PDI-62-SG	Grab	--	1068912.5	121995.6	
PDI-63-SG	Grab	--	1068877.7	122122.7	
PDI-64-SG	Grab	--	1068829.3	122148.0	
PDI-65-C	Core	6	1068870.3	122175.5	
PDI-66-SG	Grab	--	1068823.7	122214.8	
PDI-67-C	Core	6	1068726.4	122228.4	
PDI-68-C	Core	6	1068651.5	122276.9	

Notes:

-- Not applicable.

1 X and Y coordinates are in North American Datum of 1983 National Adjustment of 2011, State Plane Coordinate System Washington South Zone (EPSG 2286), U.S. Feet.

2 Samples from cores with the note Archive will be held at the lab for secondary analysis, based on adjacent preliminary results.

Abbreviations:

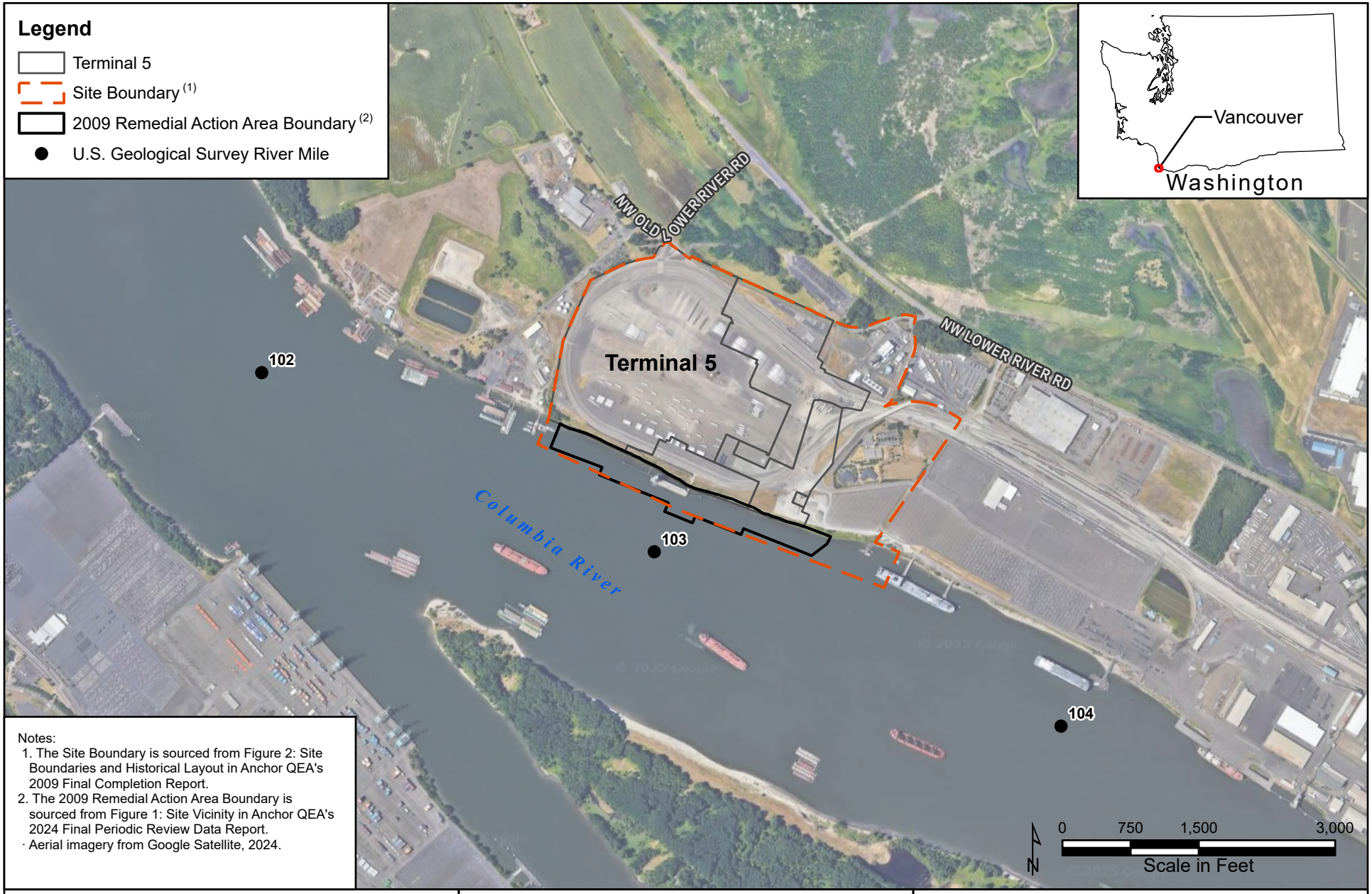
EPSG European Petroleum Survey Group

PDI Pre-design investigation

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Figures



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Vancouver, Washington

Figure 1.1
Vicinity Map

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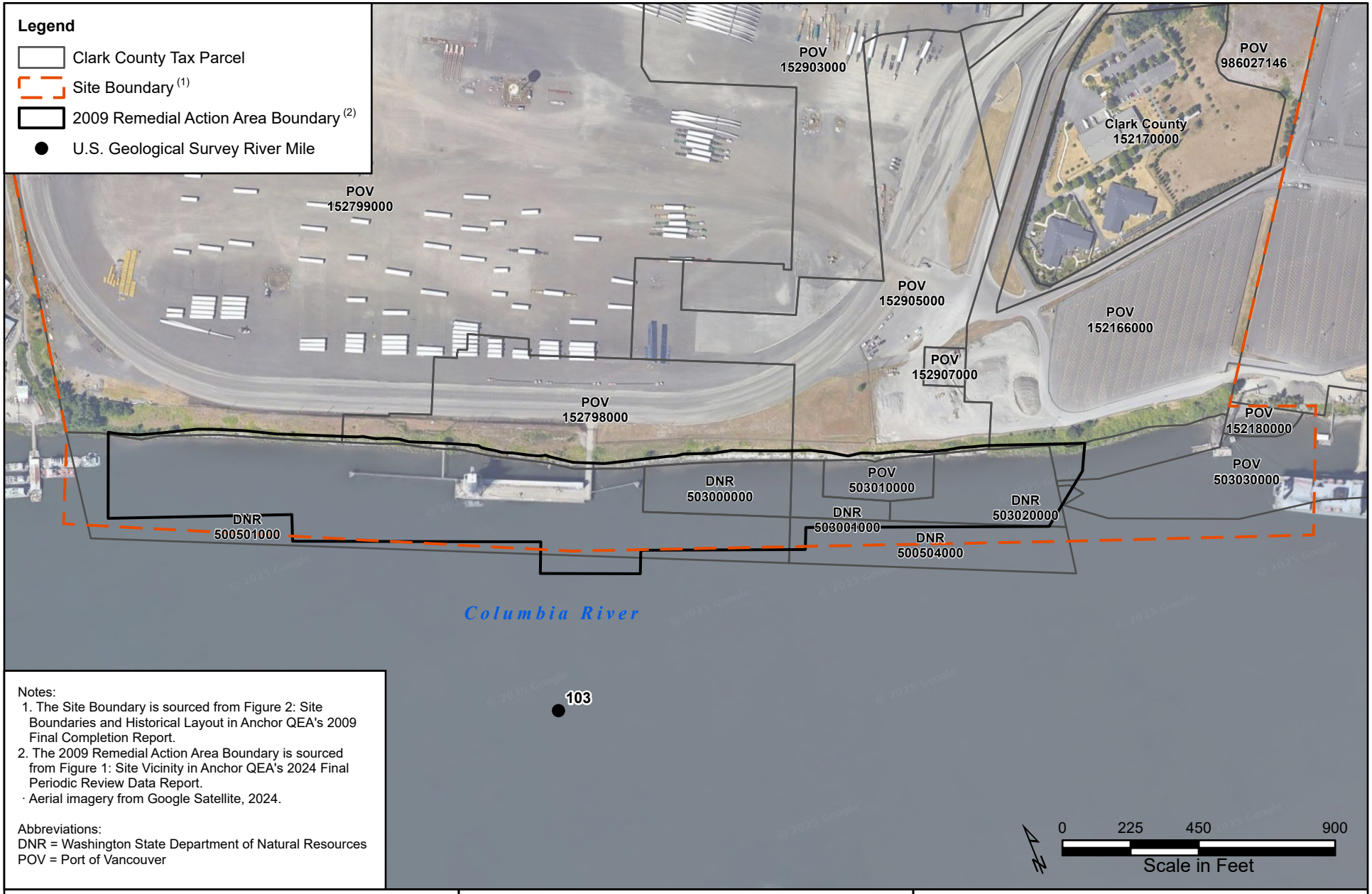
3/14/2025



Notes:
1. The Site Boundary is sourced from Figure 2: Site Boundaries and Historical Layout in Anchor QEA's 2009 Final Completion Report.
2. The 2009 Remedial Action Area Boundary is sourced from Figure 1: Site Vicinity in Anchor QEA's 2024 Final Periodic Review Data Report.
· Aerial imagery from Google Satellite, 2024.

Abbreviations:
DNR = Washington State Department of Natural Resources
POV = Port of Vancouver

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Vancouver, Washington

Figure 2.1
Site Parcel Ownership

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3/21/2025

Legend

- Proposed Grab Location
- Proposed Core Location
- Surface Sample Location
- Subsurface Sample Location
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

- >700
- >110–700
- >97–110
- ≤ 97

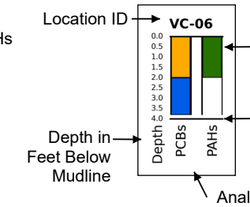
***Concentration Information for Sample Results (2)**

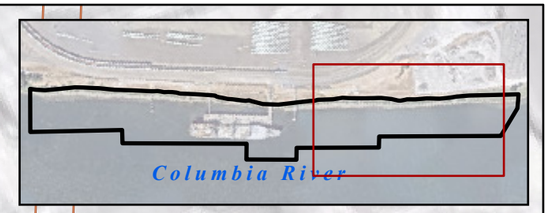
- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Surface Grab Concentration Information*

PCBs ← → PAHs

Subsurface Sediment Data Labels





AV-VC-12-2022 · AV-VC-13-2022 · AV-VC-01 · AV-VC-15-2022 · AV-VC-16-2022 · AV-VC-17-2022 · AV-VC-14-2022 · AV-VC-02 · VC-07 · VC-08

Storm Sewer Easement

18-Inch CMP Outfall

CPU Aquatic Lease

MATCH LINE

PDI-32-SG · PDI-37-SG · PDI-36-C · PDI-38-SG · PDI-35-SG · PDI-35-C · PDI-33-SG · PDI-34-C · PDI-30-C · PDI-31-SG · PDI-28-SG · PDI-29-SG · PDI-24-SG · PDI-25-C · PDI-26-SG · PDI-27-SG · PDI-23-C · PDI-22-C · PDI-21-C · PDI-21-SG · PDI-20-C · PDI-19-C · PDI-19-SG · PDI-17-C · PDI-18-C · PDI-15-SG · PDI-14-C · PDI-16-C · PDI-16-SG · PDI-13-C · PDI-13-SG · PDI-12-C · PDI-11-C · PDI-11-SG · PDI-10-SG · PDI-09-SG · PDI-08-C · PDI-07-SG · PDI-06-C · PDI-05-C · PDI-04-SG · PDI-04-C · PDI-03-C · PDI-03-SG · PDI-02-C · PDI-01-C

AV-SG-04 · AV-SG-23 · AV-SG-33-2022 · AV-SG-22 · AV-SG-34-2022 · AV-SG-32-2022 · AV-SG-03 · AV-SG-25 · AV-SG-02 · AV-SG-26 · AV-SG-01 · AV-SG-05

OSG-14 · OSG-01 · OSG-13 · OSG-02 · OSG-03 · OSG-04 · OSG-15 · OSG-16 · OSG-05 · OSG-12 · OSG-06 · OSG-07 · OSG-17 · OSG-08 · OSG-09 · OSG-10 · OSG-11 · OSG-18

RSG-02 · SG-03 · SG-04 · SG-05

-5 · -10 · -15 · -20 · -25 · -30 · -35 · -40 · -45 · -50

Notes:

1. Interpolated surface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCB Aroclors results from sediment grab samples (0–10 centimeters below mudline) and core sample results from the 0–0.5 feet below mudline interval. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. PAHs not exceeding any criteria are green; PCBs not exceeding any criteria are blue.
   - Total PCBs Criteria:
     - CUL = 97 µg/kg
     - SCO = 110 µg/kg
   - Total PAHs Criteria:
     - SCO = 17,000 µg/kg
   - Bathymetry contours created from 2022 Conditions Survey.
   - Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CMP = Corrugated metal pipe
CPU = Clark County Public Utilities
CRD = Columbia River Datum
CUL = Cleanup level
µg/kg = Micrograms per kilogram
PAH = Polycyclic aromatic hydrocarbon
PCB = Polychlorinated biphenyl
SCO = Sediment cleanup objective

0 40 80 160
Scale in Feet

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Vancouver, Washington

Figure 6.1a
Current Data and Surface Total PCBs Interpolation with Proposed PDI Sampling Locations

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5/13/2025

Legend

- Proposed Grab Location
- Proposed Core Location
- Surface Sample Location
- Subsurface Sample Location
- 2009 Shoreline Armored Cap Area
- 2009 Remedial Action Area Boundary
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

- >700
- >110–700
- >97–110
- ≤ 97

***Concentration Information for Sample Results (2)**

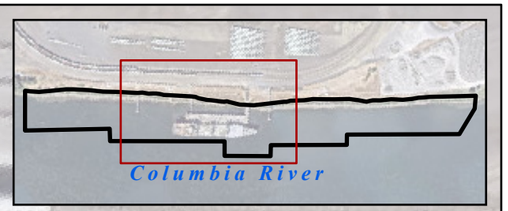
- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Surface Grab Concentration Information*

PCBs ← → PAHs

Subsurface Sediment Data Labels

Location ID → VC-06 (Depth, PCBs, PAHs) ← *Sample Interval with Concentration Information; ← Bottom of Core; Depth in Feet Below Mudline; Analyte



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AV-SG-14 · PDI-68-C · PDI-67-C · AV-SG-29-2022 · PDI-66-SG · PDI-65-C · SG-01 · AV-SG-08 · AV-SG-30-2022 · PDI-64-SG · PDI-63-SG · AV-SG-15 · AV-SG-09 · AV-SG-18 · PDI-55-SG · PDI-54-C · AV-BVC-10 · AV-BVC-11 · PDI-45-SG · PDI-41-SG · RSG-01 · PDI-40-SG · AV-SG-06 · AV-SG-33-2022 · RSG-02 · AV-SG-17 · AV-BVC-05 · AV-SG-19 · PDI-46-C · PDI-47-C · PDI-42-C · FP-06-SG-2022 · FP-06-SG · FP-05-SG-2022 · FP-05-SG · FP-04-SG-2022 · FP-04-SG · PDI-56-C · FP-03-SG-2022 · FP-03-SG · FP-02-SG-2022 · FP-02-SG · FP-01-SG-2022 · FP-01-SG · PDI-44-C · AV-VC-03-2022 · PDI-44-SG · AV-SG-21 · AV-SG-31-2022 · PDI-38-SG · PDI-62-SG · PDI-58-SG · PDI-57-C · PDI-53-C · PDI-48-SG · PDI-52-SG · SG-02 · PDI-43-C · PDI-39-SG · AV-SG-16 · AV-SG-07 · PDI-61-SG · PDI-59-C · AV-SG-28 · PDI-49-SG · PDI-50-C · AV-SG-32-2022 · PDI-60-SG · PDI-51-SG · AV-SG-20

VC-03 · RVC-01 · RVC-02 · FP-06-VC · VC-04 · B17A-SC-1 · B17A-SC-C1 · FP-02-VC · AV-VC-04-2022 · AV-VC-04 · FP-01-VC · Slough-2 · AV-VC-03 · VC-06

MATCH LINE

Notes:
1. Interpolated surface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCB Aroclors results from sediment grab samples (0–10 centimeters below mudline) and core sample results from the 0–0.5 feet below mudline interval. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. PAHs not exceeding any criteria are green; PCBs not exceeding any criteria are blue.
   - Total PCBs Criteria:
     - CUL = 97 µg/kg
     - SCO = 110 µg/kg
   - Total PAHs Criteria:
     - SCO = 17,000 µg/kg
   - Bathymetry contours created from 2022 Conditions Survey.
   - Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CMP = Corrugated metal pipe
CPU = Clark County Public Utilities
CRD = Columbia River Datum
CUL = Cleanup level
µg/kg = Micrograms per kilogram
PAH = Polycyclic aromatic hydrocarbon
PCB = Polychlorinated biphenyl
SCO = Sediment cleanup objective

0 40 80 160
Scale in Feet

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Vancouver, Washington

Figure 6.1b
Current Data and Surface Total PCBs Interpolation with Proposed PDI Sampling Locations

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5/13/2025

Legend

- Proposed Grab Location
- Proposed Core Location
- Core interval extending beyond target interpolation depth range[2]
- Surface Sample Location
- Subsurface Sample Location
- 2009 Shoreline Armored Cap Area
- 2009 Remedial Action Area Boundary
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

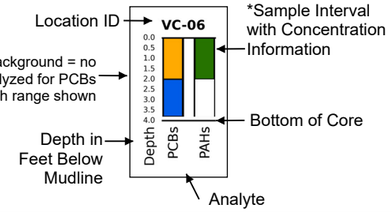
Interpolated Surface Sediment Total PCBs Concentration (µg/kg)[1,2]

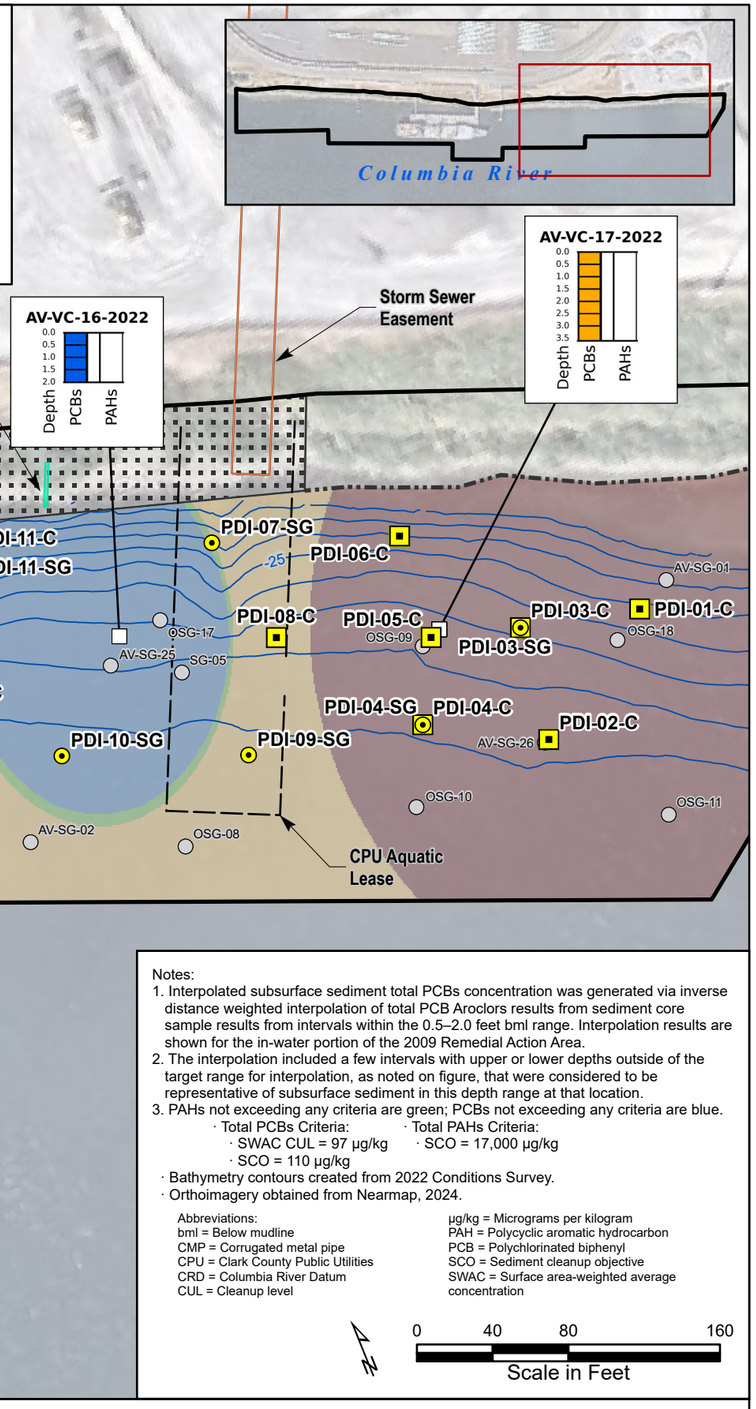
- >700
- >110–700
- >97–110
- ≤ 97

***Concentration Information for Sample Results[3]**

- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Subsurface Sediment Data Labels





Notes:

1. Interpolated subsurface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCB Aroclors results from sediment core sample results from intervals within the 0.5–2.0 feet bml range. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. The interpolation included a few intervals with upper or lower depths outside of the target range for interpolation, as noted on figure, that were considered to be representative of subsurface sediment in this depth range at that location.
3. PAHs not exceeding any criteria are green; PCBs not exceeding any criteria are blue.
   - Total PCBs Criteria:
     - SWAC CUL = 97 µg/kg
     - SCO = 110 µg/kg
   - Total PAHs Criteria:
     - SCO = 17,000 µg/kg

- Bathymetry contours created from 2022 Conditions Survey.
- Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
bml = Below mudline
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CPU = Clark County Public Utilities
CRD = Columbia River Datum
CUL = Cleanup level
µg/kg = Micrograms per kilogram
PAH = Polycyclic aromatic hydrocarbon
PCB = Polychlorinated biphenyl
SCO = Sediment cleanup objective
SWAC = Surface area-weighted average concentration

0 40 80 160
Scale in Feet

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Figure 6.2a
Current Data and 0.5–2.0 Feet bml Subsurface Interpolation with Proposed PDI Sampling Locations

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Legend

- Proposed Grab Location
- Proposed Core Location
- Core interval extending beyond target interpolation depth range[2]
- Surface Sample Location
- Subsurface Sample Location
- 2009 Shoreline Armored Cap Area
- 2009 Remedial Action Area Boundary
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

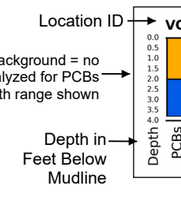
Interpolated Surface Sediment Total PCBs Concentration (µg/kg)[1,2]

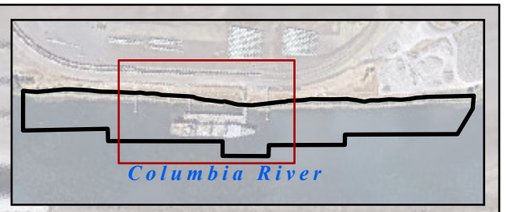
- >700
- >110–700
- >97–110
- ≤ 97

***Concentration Information for Sample Results[3]**

- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Subsurface Sediment Data Labels





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PDI-66-SG · PDI-68-C · PDI-67-C · PDI-65-C · PDI-64-SG · PDI-63-SG · PDI-55-SG · PDI-54-C · PDI-45-SG · PDI-41-SG · PDI-40-SG · PDI-46-C · PDI-42-C · PDI-56-C · PDI-47-C · PDI-44-SG · PDI-57-C · PDI-53-C · PDI-48-SG · PDI-62-SG · PDI-58-SG · PDI-52-SG · PDI-43-C · PDI-61-SG · PDI-59-C · PDI-50-C · PDI-49-SG · PDI-60-SG · PDI-51-SG · PDI-38-SG · PDI-39-SG

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-5 · -10 · -15 · -20 · -25 · -30 · -35 · -40 · -45 · -50

VC-03 · RVC-01 · RVC-02 · FP-06-VC · VC-04 · B17A-SC-1 · B17A-SC-C1 · FP-02-VC · AV-VC-04-2022 · AV-VC-04 · FP-01-VC · Slough-2 · AV-VC-03 · VC-06

MATCH LINE

Notes:
1. Interpolated subsurface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCB Aroclors results from sediment core sample results from intervals within the 0.5–2.0 feet bml range. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. The interpolation included a few intervals with upper or lower depths outside of the target range for interpolation, as noted on figure, that were considered to be representative of subsurface sediment in this depth range at that location.
3. PAHs not exceeding any criteria are green; PCBs not exceeding any criteria are blue.
   - Total PCBs Criteria:
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Abbreviations:
bml = Below mudline
CMP = Corrugated metal pipe
CPU = Clark County Public Utilities
CRD = Columbia River Datum
CUL = Cleanup level
µg/kg = Micrograms per kilogram
PAH = Polycyclic aromatic hydrocarbon
PCB = Polychlorinated biphenyl
SCO = Sediment cleanup objective
SWAC = Surface area-weighted average concentration

0 40 80 160
Scale in Feet

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Figure 6.2b
Current Data and 0.5–2.0 Feet bml Subsurface Interpolation with Proposed PDI Sampling Locations

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5/13/2025

Legend

- Proposed Grab Location
- Proposed Core Location
- Core interval extending beyond target interpolation depth range[2]
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- Subsurface Sample Location
- 2009 Shoreline Armored Cap Area
- 2009 Remedial Action Area Boundary
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

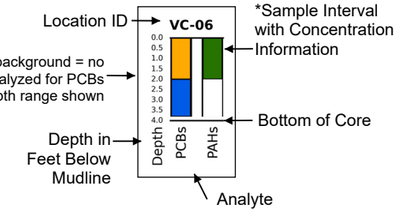
Interpolated Surface Sediment Total PCBs Concentration (µg/kg) [1,2]

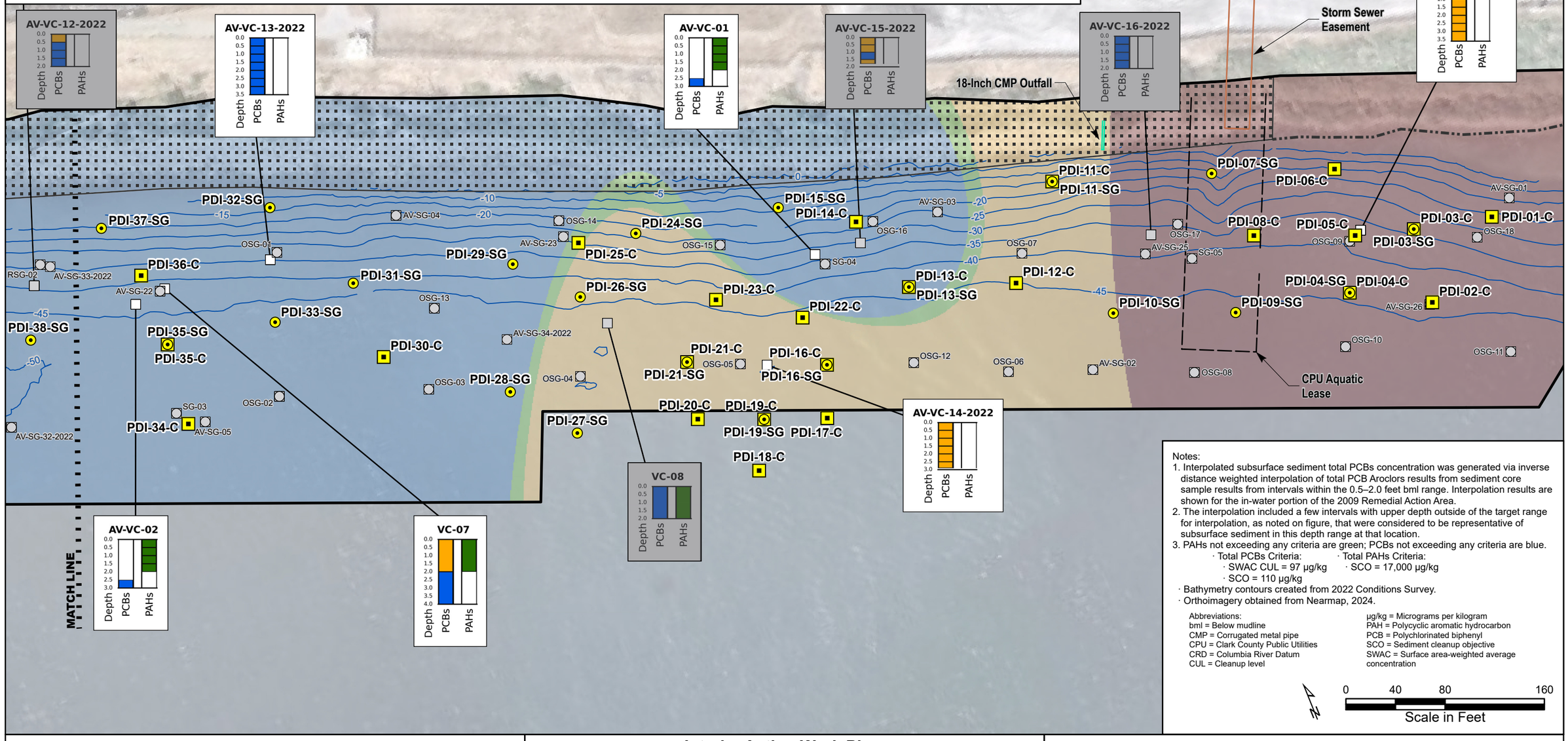
- >700
- >110–700
- >97–110
- ≤ 97

***Concentration Information for Sample Results [3]**

- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Subsurface Sediment Data Labels





Notes:

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0 40 80 160
Scale in Feet

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Vancouver, Washington

Figure 6.3a
Current Data and 2.0–4.0 Feet bml Subsurface Interpolation with Proposed PDI Sampling Locations

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Legend

- Proposed Grab Location
- Proposed Core Location
- Core interval extending beyond target interpolation depth range[2]
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- Subsurface Sample Location
- 2009 Shoreline Armored Cap Area
- 2009 Remedial Action Area Boundary
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)

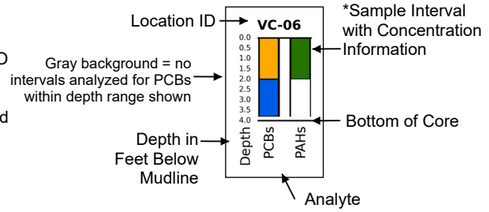
Interpolated Surface Sediment Total PCBs Concentration (µg/kg) [1,2]

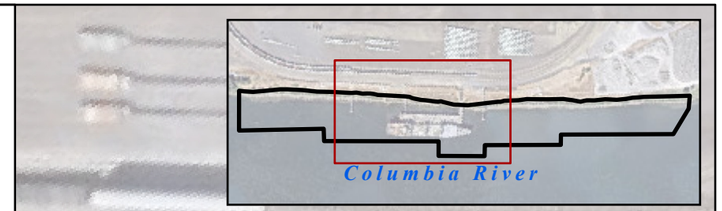
- >700
- >110–700
- >97–110
- ≤ 97

***Concentration Information for Sample Results [3]**

- >SCO
- >CUL–≤SCO
- ≤CUL
- Not Analyzed

Subsurface Sediment Data Labels





Notes:
1. Interpolated subsurface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCB Aroclors results from sediment core sample results from intervals within the 0.5–2.0 feet bml range. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
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CRD = Columbia River Datum
CUL = Cleanup level
µg/kg = Micrograms per kilogram
PAH = Polycyclic aromatic hydrocarbon
PCB = Polychlorinated biphenyl
SCO = Sediment cleanup objective
SWAC = Surface area-weighted average concentration

0 40 80 160
Scale in Feet

MATCH LINE

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Vancouver, Washington

Figure 6.3b
Current Data and 2.0–4.0 Feet bml Subsurface Interpolation with Proposed PDI Sampling Locations

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5/13/2025

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix A
Field Sampling Plan

Table of Contents

1.0 Introduction A-1
2.0 Project Organization and Responsibilities A-3
2.1 PROJECT TEAM RESPONSIBILITIES A-3
2.2 MANAGEMENT RESPONSIBILITIES A-3
2.2.1 Mary Mattix—Port of Vancouver Project Manager A-3
2.2.2 Jessi Massingale—Floyd|Snider Project Manager A-3
2.3 FIELD RESPONSIBILITIES A-3
2.3.1 Kara Hitchko—Floyd|Snider Field QA Officer A-3
2.4 DOCUMENTATION AND RECORDS A-3
2.5 SPECIAL TRAINING AND CERTIFICATIONS A-4
3.0 Sampling Design and Approach A-5
4.0 Sample Collection and Handling Procedures A-7
4.1 POSITIONING METHODOLOGY A-7
4.2 VERTICAL ACCURACY A-7
4.3 SAMPLE IDENTIFICATION A-8
4.3.1 Sediment Core Samples A-8
4.3.2 Surface Grab Sediment Samples A-8
4.4 FIELD DOCUMENTS AND FORMS A-9
4.5 FIELD CHANGE MANAGEMENT A-9
4.6 SEDIMENT CORE SAMPLING AND PROCESSING PROCEDURES A-9
4.6.1 Sediment Core Sampling A-9
4.6.2 Sediment Core Processing A-13
4.7 SURFACE GRAB SEDIMENT SAMPLING AND PROCESSING A-14
4.8 BULK SEDIMENT AND SITE WATER SAMPLING FOR TREATABILITY TESTING A-15
4.8.1 Bulk Sediment Sampling A-15
4.8.2 Surface Water Sampling for Use in the Treatability Testing A-16
4.9 FIELD QUALITY CONTROL SAMPLES A-17
4.10 DECONTAMINATION A-17
4.11 INVESTIGATION-DERIVED WASTE A-18
4.12 SAMPLE HANDLING PROCEDURES AND REQUIREMENTS A-18

4.12.1 Sample Custody A-18
4.12.2 Sample Containers, Preservation, and Shipping Requirements A-19
4.13 ASSESSMENT AND OVERSIGHT A-19
5.0 Sample Analysis A-21
5.1.1 Sediment Analysis A-21
5.1.2 Treatability Testing with Bulk Sediment and Site Water A-21
6.0 References A-23

List of Tables

Table A.1 Sample Locations, Coordinates, Core Target Depths, and Sample Analysis

List of Figures

Figure A.1a and b Proposed PDI Grab and Core Sampling Locations

List of Attachments

Attachment A.1 Floyd|Snider Standard Guidelines for Sediment Sampling

List of Abbreviations

Abbreviation	Definition
Apex	Apex Laboratories, LLC
bml	Below mudline
cm	Centimeters
DGPS	Differential global positioning system
DRET	Dredging elutriate test
Ecology	Washington State Department of Ecology
FSP	Field Sampling Plan
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IAWP	Interim Action Work Plan
L	Liter

Abbreviation	Definition
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PM	Project Manager
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
Site	Terminal 5 Alcoa Vancouver Site
TOC	Total organic carbon
V-SAM	Vibracore sediment acquisition monitoring

1.0 Introduction

This Field Sampling Plan (FSP) presents the procedures for sediment sampling at the Terminal 5 Alcoa Vancouver Site (Site) located in Vancouver, Washington. It has been prepared as an appendix to the Interim Action Work Plan (IAWP), which was prepared on behalf of the Port of Vancouver (Port). The IAWP describes the proposed cleanup action to address remaining contamination in Site sediments.

The cleanup action is being conducted in accordance with an Agreed Order (Order #XXXXXX) between the Port and the Washington State Department of Ecology (Ecology). The purpose of sediment sampling is to inform the remedial design for the cleanup action. The primary objective is to characterize the extent of sediment contamination exceeding cleanup standards, where the vertical or horizontal extent has not yet been delineated.

This FSP is organized into the following sections:

- Section 2.0—Project Organization and Responsibilities
- Section 3.0—Sampling Design and Approach
- Section 4.0—Sample Collection and Handling Procedures
- Section 5.0—Sample Analysis
- Section 6.0—References

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2.0 Project Organization and Responsibilities

2.1 PROJECT TEAM RESPONSIBILITIES

The following sections describe the responsibilities of project team members for fulfillment of the FSP.

2.2 MANAGEMENT RESPONSIBILITIES

2.2.1 Mary Mattix—Port of Vancouver Project Manager

Ms. Mattix is the Port's Director of Environmental Services and Project Manager for this project. She will be overseeing all aspects of the planning and implementation of the project.

2.2.2 Jessi Massingale—Floyd|Snider Project Manager

Ms. Massingale will have overall responsibility for project implementation. As Project Manager, she will be responsible for the overall quality assurance (QA) on this project to ensure that it meets technical and contractual requirements. The Floyd|Snider Project Manager will report directly to the Port's Project Manager and is responsible for technical quality control (QC) and project oversight. She will also support the Port in coordinating with Ecology.

2.3 FIELD RESPONSIBILITIES

2.3.1 Kara Hitchko—Floyd|Snider Field QA Officer

The Floyd|Snider Field QA Officer will oversee and coordinate daily field activities. The Field QA Officer will report directly to the Floyd|Snider Project Manager and will provide overall direction for field sampling, including logistics, personnel assignments, field operations, and project team communication during field sampling. Her responsibilities also include supervising sample collection; ensuring compliance with sampling and handling requirements, including field decontamination procedures; supervising sample logging; and ensuring chain-of-custody for all samples is maintained. The Floyd|Snider Field QA Officer will provide daily summaries of field progress to the Floyd|Snider PM and report any deviations from the FSP. Floyd|Snider will be responsible for reporting significant deviations from the FSP to Ecology.

2.4 DOCUMENTATION AND RECORDS

Floyd|Snider will store all project records in a secure manner. Each project team member is responsible for filing all project information and records according to internal Floyd|Snider requirements.

Documents and records generated in the field should be considered controlled documents that become part of the project file. Floyd|Snider field staff will keep a daily record of significant events, observations, and measurements on forms specific to the field activity.

2.5 SPECIAL TRAINING AND CERTIFICATIONS

The Field QA Officer and all field personnel will be 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certified, consistent with Occupational Safety and Health Administration 29 CRF 1910.120, and be trained in the sediment sample collection methods described in the following sections. The Field QA Officer will be responsible for ensuring that field staff and contractors have the necessary training and that field staff are up to date on the annual 8-hour HAZWOPER refresher course.

3.0 Sampling Design and Approach

The proposed sample locations have been selected to address data gaps in the existing 2018 to 2022 dataset and to accurately delineate the necessary dredge extents for the Interim Action. Bulk sediment and surface water samples will also be collected for treatability testing, including the dredging elutriate test (DRET) to provide bench-scale elutriate samples for analytical testing and water clarification assessments. The DRET results will provide data to support the design of dredge return water treatment. The sampling design and approach for surface sediment sampling, sediment core sampling, and dredge elutriate testing are summarized below:

- **Surface Sediment Grab Sampling**—Sediment grab samples will be collected across the Site to delineate the horizontal extent of total polychlorinated biphenyls (PCBs) and total polycyclic aromatic hydrocarbons (PAHs) contamination in surface sediment and increase the spatial density of surface data.
- **Sediment Core Sampling**—Sediment core samples will be collected across the Site to delineate and refine the vertical and horizontal extent of total PCBs and total PAHs contamination in subsurface sediment. Proposed cores have been located to (1) delineate the vertical extent of contamination where existing data do not delineate the depth of contamination exceeding cleanup standards or (2) refine the depth of contamination where existing data include long core intervals that provide insufficient precision for design. Additional proposed cores have been located to delineate the horizontal extent of contamination exceeding cleanup standards in subsurface sediments. Five of the proposed cores are secondary step-outs from contamination observed in the existing dataset and will be archived at the laboratory pending the results of the adjacent proposed primary step-out locations.

Bulk sediment and surface water samples will be collected and used for treatability testing, including DRETs, jar tests, and physical evaluation of bulk sediment. DRETs will be performed following laboratory standard operating procedures and protocols described in the Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities—Testing Manual (U.S. Army Corps of Engineers 2003). DRET elutriate and jar test supernatant will be analyzed and used to evaluate water quality best management practices for dredging and design a water treatment system for dredge return water. The DRET and jar tests are bench-scale tests that simulate the mixing of surface water and sediment that occurs during dredging, then allow solids to settle for a specified duration, after which water can be extracted for evaluation.

A vessel is currently moored at Berth 17. If the vessel cannot be moved for the sampling event, the methodology for sample collection at locations beneath it will be similar to all other locations, with notable differences described in Sections 4.1, 4.6.1, and 4.7.

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4.0 Sample Collection and Handling Procedures

Sediment sampling will be performed in accordance with Ecology's Sediment Cleanup User's Manual (Ecology 2021) and Floyd|Snider standard guidelines presented in Attachment A.1. The sediment core and surface grab sediment locations and coordinates are listed in Table A.1 and are shown on Figures A.1a and A.1b. A vessel is currently moored at Berth 17. If the vessel cannot be moved for the sampling event, then collection of sediment samples beneath the vessel will be assisted by divers as described in Sections 4.6.1 and 4.7.

If cultural resources are encountered during sample collection, the provisions of the project-specific Archaeological Inadvertent Discovery Plan will apply. The draft Inadvertent Discovery Plan is attached to the IAWP as Appendix E.

4.1 POSITIONING METHODOLOGY

Sampling locations will be determined in latitude and longitude using a differential global positioning system (DGPS) unit referenced to North American Datum of 1983 National Adjustment of 2011, State Plan Coordinate System Washington South Zone, U.S. Feet. The DGPS accuracy will be confirmed each morning or evening. Sample location coordinates will be logged into the DGPS on board the sampling vessel. The target accuracy of measured and recorded horizontal coordinates is within 1 foot. Refer to Table A.1 for sample locations and target coordinates.

Every effort will be made to position the sample locations in the locations shown in Figures 6.1a and 6.1b of the IAWP. To maintain position during core and grab sample collection, the vessel will be anchored at each sampling location. The vessel operator will monitor DGPS coordinates throughout sampling. If the vessel drifts from the target location, it will be re-anchored and repositioned before sampling proceeds. If a sample is unable to be collected due to field conditions (e.g., debris at the mudline or a steep slope) or insufficient clearance beneath the vessel that may remain moored at Berth 17, sample locations may need to be relocated. Field personnel will relocate the sample location as close as possible to the original sampling location (within 25 feet).

If the vessel moored at Berth 17 cannot be moved for the sampling event, sample locations beneath it will be identified by divers as close as possible to the target sampling location. Because DGPS is not available beneath the vessel, these locations will be estimated using measured distances from fixed reference points, such as distance from the end of the berth.

4.2 VERTICAL ACCURACY

To characterize the vertical extent of potential sediment contamination, field personnel should attempt to achieve a vertical accuracy of ±0.1 feet. Vertical accuracy is important to ensure that sample data informs dredge design so that excavation depths effectively remove all contaminated material. Prior to sampling, the depth to mudline (water depth) will be collected

using a lead line or from the vessel depth finder. Field personnel will then determine the mudline elevation using real-time water level elevations from the National Oceanic and Atmospheric Administration tides and currents portal available at the following website: https://tidesandcurrents.noaa.gov/ports/textscreen.shtml?port=cr.

The mudline elevation will be calculated by subtracting the real-time water level (the tide elevation in feet Columbia River Datum) from the lead line water depth or depth sounder reading. The real-time mudline elevation will be recorded on the field form. Following the sampling event, the mudline elevation will be confirmed using the verified water level (tide elevation), which may differ from the real-time water level.

Because of the dense nature of the Columbia River sand and the presence of cobbles and debris at the Site, the percent recovery in accepted cores has historically been low (less than 75%). Low percent recovery results in uncertainty in the assignment of the in situ depth below mudline (bml). To improve vertical accuracy of in situ depth assignments, sediment core samples will be collected using vibracore sediment acquisition monitoring (V-SAM). V-SAM uses dual fathometers to incrementally monitor the distance from the top of the core tube to the surrounding sediment bed and the collected sediment core within the tube during the drive. This information can improve the accuracy of the measurement of the drive penetration depth and percent recovery (the amount of sediment collected over the drive distance). An overview of V-SAM is provided in Section 4.6.

V-SAM has been successfully implemented at other sites such as Portland Harbor, to ensure that the depth of contamination is determined with acceptable accuracy when collecting deep sediment cores and coring in areas where sample recovery has historically been low.

4.3 SAMPLE IDENTIFICATION

Samples will be identified by their location and depth using a standardized format that combines the location identifier (ID) and depth increment. Location IDs are listed in Table A.1.

4.3.1 Sediment Core Samples

Sediment core sample IDs will have the following format: [Location ID]-[upper depth]-[lower depth]. The depth interval for cores will be defined within 0.1 feet.

For example, the core sample from location PDI-22-C, collected from 1 to 2 feet, would be labeled "PDI-22-C-1.0-2.0."

4.3.2 Surface Grab Sediment Samples

Surface sediment sample IDs will have the following format: [Location ID]-[upper depth]-[lower depth]. The depth interval for surface grabs will be defined within 1 centimeter (cm).

For example, a surface grab from location PDI-23-SG, collected from the 0- to 10-cm depth interval would be labeled "PDI-23-SG-0-10."

4.4 FIELD DOCUMENTS AND FORMS

All field activities will be recorded in a field logbook maintained by the Field QA Officer or their designee. The field logbook will provide a description of all sampling activities, communication between the field team and Ecology field oversight personnel, weather conditions, and any modifications to the procedures and plans identified in this FSP, the Quality Assurance Project Plan (QAPP), or the HASP. Photographs taken of the sediment samples will provide additional documentation of sediment collection activities.

Field sampling forms are provided in Attachment A.1 and will be maintained by the field staff for each sampling location. All sampling forms will include at a minimum the following information:

- Project name
- Field staff on-site
- Field observations
- Sample collection date and time
- Sample method and/or description of field activities
- Instruments or equipment used
- Location ID and Sample ID
- Sample analysis
- Deviations from the IAWP or this FSP

Additional observations and documentation specific to sample collection will be recorded in accordance with the procedures presented in this FSP and the Floyd|Snider standard guidelines (Attachment A.1).

4.5 FIELD CHANGE MANAGEMENT

Deviations from this FSP or the Floyd|Snider standard guidelines, such as abandonment of a sample location, will be coordinated in the field with the Floyd|Snider PM and Port PM and evaluated in consultation with Ecology.

4.6 SEDIMENT CORE SAMPLING AND PROCESSING PROCEDURES

4.6.1 Sediment Core Sampling

Sediment cores will be collected using V-SAM from a sampling vessel equipped with a vibracore and dual fathometers. If the vessel moored at Berth 17 cannot be moved for the sampling event, the sediment cores beneath the vessel will be collected using the same methodology; however, divers will position the vibracore at the sample location. A detailed description of V-SAM is provided in Section 4.6.1.1. Cores will be collected as follows:

- The vibracore will be lowered to the mudline, where the unit will be energized in increments until the desired penetration depth is achieved, or to refusal. The target

depth of the bottom sample interval is presented in Table A.1. The individual drive increments are typically 1 to 3 feet and will be determined in the field by the marine contractor.

  - Target depths were defined based on an evaluation of 2018 to 2022 core analytical results, with the intent to determine or refine the depth of contamination in locations where data is not available or where previous core sample intervals were greater than 1 foot long.

- Dual fathometers will be used to measure core penetration (the distance from the top of the core tube to the surrounding sediment bed) and sediment acquisition (the level of sediment collected within the core tube).
  - The incremental measurements of sediment acquisition and core penetration will be recorded through the full advancement of the core tube and plotted (acquisition curve).
  - These measurements will be used to calculate percent recovery for the individual drive increments.
  - The acquisition curve will be used to establish in situ depths and to develop a core cut plan for the core processing team.
- Cores will be extracted from sediment using the minimum vibratory power necessary for extraction, placed on the deck of the vessel, and capped.
- Field staff will note the time, water depth, sample coordinates, penetration and recovery information, and any observable indications of contamination on the core tube such as sheen/staining immediately upon recovery. A core collection form is included in Attachment A.1.
  - If discrepancies exist between the recorded total recovery at the end of the drive and the measured core length upon retrieval, bottom loss will be evaluated and accounted for.
- Once retrieved, the core will be evaluated for acceptability based on the following criteria:
  - Overlying water is present and the surface is intact.
  - The core tube is in good condition (not excessively bent).
  - Target penetration depth is achieved.
  - The incremental percent recovery is at least 75% in at least two-thirds of the incremental depth intervals.
- After acceptance, water will be carefully decanted from the top of the core tube.
- Longer tubes (i.e., greater than 5 feet) may be cut as needed for handling and transport. Each core segment will be clearly marked with the core location ID and arrows designating the top of the segment.
- Cores will be stored vertically for transport to the upland sample processing station.

- At the processing facility, cores will be stored vertically under custody (refer to Section 4.12). If the time prior to processing is sufficiently long such that the core temperature may rise the core will be stored on ice.

Up to three attempts to obtain an acceptable core will be made for each location. If a core is not accepted after the first attempt, the recovered material will be retained, and the core location will be relocated within a 25-foot radius. If an acceptable core is not collected after the second attempt, the recovered material will again be retained, and a third and final attempt will be completed within the original 25-foot radius. If the field team determines after the first or second attempt that stopping the drive to record incremental sediment acquisition data is causing refusal on the re-energization of the vibracore, subsequent attempt(s) may be executed with longer drive increments or without collecting incremental acquisition data (i.e., conventional vibracoring). The core that best meets the acceptability criteria of the three attempts will be retained and processed. If a core cannot be collected or if the collected material is not acceptable, the location may be abandoned or redefined as a surface grab location.

The determination of core acceptability on the third attempt will be based on field judgment and consultation with the Floyd|Snider Field QA Officer and PM. Modifications to the acceptability criteria will be documented. Deviations from this FSP or the Floyd|Snider standard guidelines, such as abandonment of a sample location or the decision to redefine it as a surface grab location, will be coordinated in the field with the Floyd|Snider PM and Port PM and evaluated in consultation with Ecology.

Sediment core samples will be processed at an upland processing location as described in Section 4.6.2.

4.6.1.1 Vibracore Sediment Acquisition Monitoring Overview

Incremental data acquisition during coring measures the amount of sediment collected in the core tube over a short drive distance and the associated drive length of the tube into the sediment bed. This ability to measure recovery in multiple increments, typically 1- to 3-foot intervals, and at the bottom of the drive, provides a basis for interpreting sediment recovery and for more accurately assigning in situ depth.

The depth measurements are collected from two independent fathometers as follows:

- Sediment acquisition. A narrow-beam fathometer attached to the top of the core tube is directed downward inside the core tube. The fathometer measures the distance to the top of the sediment collected inside the tube (the headspace), which decreases as sediment fills the tube. The headspace is recorded at each drive increment and is used to calculate the corresponding sediment recovery.
- Core penetration. A second fathometer attached to the top of the core drive head measures the distance to the sediment bed, which decreases as the tube is advanced, providing a measure of core tube penetration into the sediment bed.

The incremental measurements of sediment acquisition and core penetration are recorded through the full advancement of the core tube and plotted (acquisition curve) to provide a basis for interpreting the in situ depth of the recovered sediment in the core tube. The acquisition curve is used to establish in situ depths and to develop the core cut plan, which is provided to the core processing team.

Incremental sample recovery is a useful tool for more precisely understanding the in situ depth of sediment core samples in situations when sample recoveries are less than core penetration into the bed. An improved understanding of in situ sample depth is a key component of data evaluation and provides greater data accuracy and resolution, which is particularly useful for design.

Incomplete sample recovery and lower percent recovery may occur due to the following:

- Pile driving or compaction during vibracoring. The internal friction between sediment in the tube and the inner wall of the tube can partially block additional material from entering the tube (i.e., pile driving) or cause material to compress as it enters the tube (compaction). This mechanism is exacerbated by deeper sampling depths and firmer sample materials.
- Bottom loss. Sediment that is accumulated in the core tube during the initial drive may fall out of the bottom of the tube when it is retrieved. Bottom loss can result when coring in soft or loose sediments, or when vibration is necessary to free the core tube from the surrounding sediment during retrieval.

Over the course of longer drives using conventional vibracoring methodologies (without incremental data acquisition), the cumulative effects of pile driving/compaction or bottom loss can cause a high degree of uncertainty in the true in situ depth of samples, even in a core with otherwise acceptable recovery. The uncertainty of the in situ depth of the conventional vibracore sample is calculated by multiplying the drive length by the percentage of the sample not recovered (i.e., the recovery percentage subtracted from 100%). For example, when collecting core samples to 20 feet bml, 75% recovery results in an uncertainty of 20 feet × (1-0.75) = ±5 feet.

Incremental measurement of sediment recovery over shorter drive intervals helps to mitigate the uncertainties of pile driving/compaction and possible bottom loss as well as the compounding effects of these issues over longer drives by estimating the percent recovery over shorter subintervals. The bulk recovery is also recorded on the incremental data acquisition form.

Assuming acquisition data are collected for every 1 to 3 feet of drive, recovery percentages less than 75% due to compaction or pile driving still yield acceptable in situ depth certainty for further data evaluation and design. For example, the following information applies if sample recoveries were based on 3-foot drives:

- 1.25 feet from 0 to 2 feet (63% recovery, depth certainty ±0.75 feet)
- 1.75 feet from 2 to 4 feet (88% recovery, depth certainty ±0.25 feet)

- 1.3 feet from 4 to 6 feet (65% recovery, depth certainty ±0.7 feet)
- 1.9 feet from 6 to 8 feet (95% recovery, depth certainty ±0.1 feet)

In this example, the total length of recovered sediment is 11.1 feet over a 15-foot drive, or a recovery percentage of 74%. Using incremental data acquisition, the depth certainty of each 3-foot measurement is known and the core may be accepted with an overall recovery percentage less than 75%.

In the scenario of bottom loss, the loss of sample is readily identified by comparing the length of recovered sediment in the retrieved core to the length of the recovered sediment recorded at the end of the coring drive.

Using the example above for a core driven 15 feet, if the recovered sample length during incremental data acquisition was 11.1 feet and the measured length of sample in the retrieved core was 10.4 feet, the difference can be attributed confidently to bottom loss during retrieval. The percent recovery of the last (bottom) drive interval would then be adjusted to account for bottom loss from this interval.

4.6.2 Sediment Core Processing

Sediment cores will be processed at an upland processing station equipped with power and water in accordance with the Floyd|Snider Standard Guidelines for Sediment Coring and Processing (Attachment A.1). All samples will be visually classified and photographed prior to removal from the core. Indications of contamination, such as discoloration, blebs, and sheen will be recorded on a core processing log provided in Attachment A.1.

Samples will be collected from the entire core length in 1-foot in situ intervals, in accordance with the core cut plan provided by the core collection team. The core cut plan will define the appropriate compaction/expansion correction for each interval of the drive. Because of compaction/expansion correction, a 1-foot in situ interval will be greater or less than 1 foot on the processing table, unless percent recovery is 100%.

Sediment from each interval will be transferred from the core tube into a decontaminated stainless steel bowl, homogenized with a clean stainless steel spoon until the sediment is uniform in color and texture, and photographed. The material should continue to be stirred while individual samples are taken of the homogenate to ensure the mixture remains homogenous and the coarse-grained sediment does not settle. Labeled laboratory provided sample jars will be filled with the homogenized sediment and the samples will be stored on ice. Jars for PCBs, PAHs, and total solids/total organic carbon (TOC) should be filled first. If insufficient volume remains for grain size analysis, then representative amounts of material from two or more 1-foot intervals may be combined to obtain the needed volume for grain size analysis. Samples combined in this way shall be assigned an ID that correctly represents the upper and lower depths represented by the combined intervals (refer to Section 4.3.1).

Upon the completion of sampling, the samples stored in the coolers containing ice will be submitted under chain of custody to Apex Laboratories, LLC (Apex) for analysis (described in Section 5.0) or for archive storage at the laboratory as detailed in Table A.1.

For each location, a representative sediment sample from the entire core length will also be collected from use in the DRET and subsequent elutriate treatability testing. Sample collection and handling are described in Section 4.8.

4.7 SURFACE GRAB SEDIMENT SAMPLING AND PROCESSING

Surface grab sediment samples will be collected using a Power Grab sampler attached to a vessel in accordance with the Floyd|Snider Standard Guidelines for Sediment Grab Sample Collection (Attachment A.1). The Power Grab is a sampling device used to collect a large volume of surface sediment. A pneumatic ram closes the grab around the surface sediment and brings it to the surface for processing. If the vessel moored at Berth 17 cannot be moved for the sampling event, surface grab samples from locations beneath the vessel will be collected by a diver using a box core, hand deployed Van Veen sampler, or similar device.

Samples will be collected from the top 10 cm of the grab sample; therefore, the target depth for the Power Grab or diver-assisted sampling device is at least 12 cm.[1] Weights will be added or removed from the Power Grab as needed to maintain a penetration depth of 12 cm.

For each grab attempt, field staff will record the sample time, location coordinates, and mudline depth. Samples will be retrieved for processing on board the vessel and evaluated for the following acceptance criteria:

- Grab sampler is not overfilled (i.e., sediment surface is not against the top of the sampler).
- Sediment surface is relatively flat, indicating minimal disturbance or winnowing during retrieval.
- Overlying water is present, indicating minimal leakage.
- If debris prevents the sampler jaws from closing fully, allowing overlying water to drain slowly, the sample may still be accepted if the surface remains intact without loss of fine-grained materials.
- Overlying water has low turbidity, indicating minimal sample disturbance.
- A target penetration depth of at least 12 cm is achieved.

Up to three attempts will be made within a 25-foot radius at each location to obtain an acceptable grab. If the target penetration depth of 12 cm is not achieved due to cobbles, debris,

[1] While the dense sands of the Columbia River are difficult to penetrate, the material is consolidated, allowing collection from the top 10 cm without sloughing or disturbing the sidewalls or bottom of the Power Grab. Therefore, a penetration depth of 12 cm allows for the collection of a surface sample from the top 10 cm that meets data quality objectives by being representative of in situ conditions and free from cross-contamination.

refusal, or other surface conditions at the target location, the grab may be relocated within a 50-foot radius. If the target penetration depth is not achieved after three attempts, the grab sample with the deepest penetration depth will be retained.

All sediment samples will be visually classified and photographed prior to removal from the sampler. Surface sediment samples will then be collected from the top 0 to 10 cm interval. Sediment from this interval will be transferred from the Power Grab into a decontaminated stainless steel bowl, homogenized with a clean stainless steel spoon until the sediment is uniform in color and texture, and photographed. The material should continue to be stirred while individual samples are taken of the homogenate to ensure the mixture remains homogenous and the coarse-grained sediment does not settle. Labeled laboratory-provided sample jars will be filled with the homogenized sediment and the samples will be stored on ice. Upon the completion of sampling, the samples stored in the coolers containing ice will be submitted under chain of custody to Apex for analysis in accordance with the QAPP (Appendix B of the IAWP).

For each location, a representative sediment sample from the 0- to 10-cm interval will also be collected from use in the DRET and subsequent elutriate treatability testing. Sample collection and handling are described in Section 4.8.

4.8 BULK SEDIMENT AND SITE WATER SAMPLING FOR TREATABILITY TESTING

Samples of bulk sediment and site water collected for use in the DRET and jar tests, and subsequent DRET elutriate and jar test supernatant testing and analysis, will be obtained by compositing representative samples of unjarred sediment collected via coring and surface grab sampling. Bulk ambient surface water will also be collected for these tests. Both composited bulk sediment and bulk surface water will be subsampled for laboratory analysis. Sample collection and handling are described in the subsections below. Sediment and required water volumes and storage requirements for the DRET are shown in the QAPP (Appendix B of the IAWP).

4.8.1 Bulk Sediment Sampling

Three composite samples of bulk sediment will be collected to represent different areas of the Site as outlined below. Each composite sample will be prepared by collecting a representative volume of sediment from each sampling location.

Composite bulk sediment samples will be prepared and named as follows:

- PDI-Comp-01—Incorporates sediment from locations PDI-01 through PDI-13, representing the most upstream portion of the Site.
- PDI-Comp-02—Incorporates sediment from locations PDI-14 through PDI-35, representing the sediment upstream of the Berth 17 dock area.
- PDI-Comp-03—Incorporates sediment from locations PDI-36 through PDI-60, representing the sediment in the vicinity of the Berth 17 dock.

The individual locations included in each bulk sediment sample may be adjusted if sediment characteristics such as grain size vary significantly across the Site. In such cases, composite samples may be grouped based on sediment type rather than geographic area.

Approximately 8 liters (L) of sediment is needed per bulk sediment sample. To prepare the composite sample and to meet minimum volume requirements, approximately 8 ounces of sediment from each 1 foot in situ core interval from each location will be collected and composited. For surface grabs, approximately 2 ounces of sediment from each grab location will be collected and composited. The excess sediment not required for chemical analysis may be used for DRET, jar tests, or bulk sediment treatability tests. The relative amount of material needed from each location, and each sample interval, may vary if the number of locations included in the composite samples is adjusted.

Bulk sediment for composite samples can be collected and retained separately for the sediment cores and surface sediment grab samples. Representative volumes of the surface grab composite and the sediment core composite can be combined at the end of the program, with the understanding that the representative volume from the surface grab composite will be small because it represents a small depth interval (0 to 10 cm).

Bulk sediment will be stored on ice or in refrigerated storage, in a decontaminated bucket or similar container, until all component samples have been added. Once complete, the composite sample will be homogenized and subsampled for use in treatability tests and for analytical testing. Samples may be homogenized by the laboratory if requested. Sediment for use in the DRET can be transferred to a labeled sealed container or zip-top plastic bag. Labeled laboratory provided sample jars will be filled with the homogenized sediment for analytical testing. Bulk sediment for use in jar tests and sediment treatability tests can be taken from the remaining bulk sediment composite sample. All sediment volumes will be stored in coolers containing ice or will be submitted under chain of custody to Apex for refrigerated storage in accordance with the QAPP (Appendix B of the IAWP).

4.8.2 Surface Water Sampling for Use in the Treatability Testing

Site surface water will be collected from one location for use in the DRET and treatability jar testing. A surface water sample from this location will also be submitted for chemical analysis (refer to Section 5.0). Surface water can be collected at the end of the sediment collection program to minimize storage requirements.

Surface water will be collected from the middle of the water column and near the center of the sampling area within the Site, upstream of the Berth 17 dock. Approximately 10 gallons (38 L) of water will be collected by a pump into 5-gallon carboys. Surface water samples for analytical testing will be collected by filling the laboratory sample containers. Suspended solids will be allowed to settle out (to the extent practicable) prior to using the water for the DRET and jar tests.

The samples will be stored in coolers containing ice and submitted under chain of custody to Apex for analysis in accordance with the QAPP (Appendix B of the IAWP).

The surface water sample will be identified as PDI-SW-01.

4.9 FIELD QUALITY CONTROL SAMPLES

The IAWP sediment sampling design involves the collection of field QC samples. Field QC is evaluated through the analysis of field duplicate and equipment blanks. Field duplicates are used to assess proper homogenization in the field, reproducibility of the sample preparation and analysis, and heterogeneity of the matrix. Equipment blank samples are used to evaluate potential field cross contamination and will be collected after decontamination of sampling equipment.

Field duplicate samples will be collected at a rate of 1 per 20 field samples. Equipment blank samples will be collected at a rate of 1 per field event, as determined by the Field QA Officer. The labeling of field QC samples is described as follows:

- Field duplicates will be labeled with a fictitious sample location by adding "100" to the sample location. For example, a field duplicate core sample collected from location PDI-22 would be named "PDI-122-Core."
- Equipment blanks will be collected by pouring laboratory-provided deionized water over decontaminated, non-dedicated field equipment. Equipment blanks will be labeled using the following format: "EB-Number-Date." For example, an equipment blank collected on August 11, 2025, would be named "EB-1-081124."

4.10 DECONTAMINATION

Decontamination is necessary for all equipment (samplers, bowls, utensils, equipment used to open cores, core processing trays/holders, etc.) that contacts any sample material prior to collecting the next sample. The decontamination procedure will include a Liquinox detergent wash and successive deionized water rinses between all sampling locations.

This decontamination procedure, based on Sediment Cleanup User's Manual (Ecology 2021) protocols, is designed to prevent cross-contamination between sample locations. Before each use and between sample locations, equipment will be decontaminated aboard the sampling vessel according to the following procedure:

1. Remove excess sediment with a brush and in situ water.
2. Scrub surfaces of equipment contacting sample material with brushes using a phosphate-free Liquinox solution.
3. Rinse equipment with clean in situ water.
4. Rinse equipment with a final spray of deionized water.

This process will be repeated prior to sampling as necessary.

4.11 INVESTIGATION-DERIVED WASTE

Investigation-derived waste will include excess sediment from the collection and processing of sediment cores and surface grabs and disposable materials used during fieldwork (e.g., disposable personal protective equipment [PPE], plastic sheeting, paper towels). Excess sediment will be collected in 5-gallon buckets or 55-gallon drums and taken upland to be stored temporarily on Port property until it has been sufficiently characterized for disposal.

All disposable sampling materials and PPE used in sample processing will be placed in heavy-duty garbage bags or other appropriate containers and disposed of as trash in the municipal collection system.

4.12 SAMPLE HANDLING PROCEDURES AND REQUIREMENTS

The Field QA Officer or their designee will be responsible for all sample tracking and custody procedures. They will also be responsible for final sample inventory and will maintain sample custody documentation. The Field QA Officer or designee will complete chain-of-custody forms prior to transporting samples. Information on the sample labels will be checked against sample collection forms, chain-of-custody forms, and sample containers will be recounted prior to transporting samples. Copies of all chain-of-custody forms will be retained and included as appendices to the final data reports.

4.12.1 Sample Custody

Sample custody is a critical aspect of environmental investigations. Sample possession and handling must be traceable from the time of sample collection, through laboratory and data analyses, to delivery of the sample results to the recipient. Procedures to be followed for sample custody related to shipping are as follows.

Samples are considered to be in custody if they are (1) in the custodian's possession of view, (2) in a secured place (under lock) with restricted access, or (3) in a container and secured with a custody seal such that the sample cannot be reached without breaking the seal. Chain-of-custody forms will accompany all samples, and each person who has custody of the samples will sign the chain-of-custody form and ensure that the samples are not left unattended unless properly secured. Information on chain-of-custody forms will include at a minimum the following:

- Sampling location, project name, and unique sample ID
- Sample collection date and time
- Any special notations on sample characteristics or problems
- Name of the person who initially collected the sample
- Date the sample was sent to the laboratory
- Shipping company name and waybill number (if applicable)

4.12.2 Sample Containers, Preservation, and Shipping Requirements

Sample volumes will be placed in laboratory-provided certified precleaned sample containers and preserved in accordance with the requirements presented the QAPP. The laboratory will maintain manufacturer documents certifying the cleanliness of containers and/or purity of preservatives provided. The Field QA Officer or a designee will also inspect containers for cleanliness, signs of damage or tampering, and presence of preservative if pre-preserved containers will be used. Individual containers with evidence of damage or tampering will be discarded, the laboratory will be notified, and replacement containers will be provided.

Samples will be delivered to the laboratory by field staff or a laboratory courier. Prior to shipping or transporting samples, containers will be securely packed inside a cooler with ice packs or wet ice and bubble wrap. The original signed chain-of-custody forms will be placed in a sealed plastic bag and taped to the inside lid of the cooler.

4.13 ASSESSMENT AND OVERSIGHT

The project field activities will be overseen by the Floyd|Snider PM. Specific procedures described in this FSP will be followed to meet data objectives as defined in the IAWP.

The Field QA Officer or designee will be responsible for field oversight and identifying issues that may result in noncompliance with this FSP or that could adversely affect data quality. They are responsible for performing corrective actions and verifying completion of any corrective actions.

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5.0 Sample Analysis

Sample analysis and the data quality objectives are described in the QAPP (Appendix B of the IAWP). This section summarizes the sediment analytical program and the DRET and elutriate treatability testing.

5.1.1 Sediment Analysis

Surface and subsurface sediment samples will be analyzed for PCBs, PAHs, TOC, total solids, and grain size. Samples requiring PCB analysis will be analyzed as Aroclors. Sediment samples will be analyzed in accordance with Table B.1 of the QAPP (Appendix B of the IAWP). The analytes, methods, and containers are summarized below. Additional sample handling requirements are presented in Table B.5 of the QAPP.

Analyte	Method	Container
Grain size (1)	ASTM D422 modified	16 oz WMG (1)
Total solids	SM 2450-G	(Combined with TOC volume)
TOC	SM 5310B modified	4 oz WMG
PCB Aroclors	USEPA 8082A	8 oz WMG
PAHs	USEPA 8082A	(Combine with PCB Aroclors volume)

Note:

1 If sample volume from the 1-foot core interval is insufficient to fill the container for grain size analysis, representative amounts of material from two or more intervals may be combined to obtain the needed volume. Containers for all other analyses should be filled first.

Abbreviations:

oz Ounces
WMG Wide-mouth glass jar

5.1.2 Treatability Testing with Bulk Sediment and Site Water

The DRET will be performed at Apex Laboratories, in accordance with the procedures described in Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities—Testing Manual (U.S. Army Corps of Engineers 2003). Three bulk sediment samples, collected as described in Section 4.7.1, will each be used in separate DRETs. A single representative Site bulk surface water sample (Section 4.7.2) will be used for all three DRETs. Similarly, jar tests, supernatant clarification testing, and bulk sediment treatability testing will be performed using bulk sediment and Site water samples.

Bulk sediment and surface water samples, elutriate produced from the DRETs, and jar test supernatant will be analyzed as described in the QAPP (Appendix B of the IAWP) and summarized below:

- One representative surface water sample will be submitted for analysis of PCBs, PAHs, total suspended solids (TSS), and conventional water quality parameters. Some conventional water quality parameters may be analyzed on-site using calibrated field instruments prior to submittal to the lab (e.g., pH, conductivity, turbidity).
- Three bulk sediment composite samples will be submitted for analysis of PCBs, PAHs, total solids, TOC, and grain size.
- DRET elutriate and jar test supernatant will be analyzed for PCBs, PAHs, TSS, and conventional water quality parameters.

Bench-scale jar tests will be performed using bulk sediment sample and Site surface water. Jar tests will be used to assess sediment settling and water treatability. Supernatant samples will be tested with several water clarification agents obtained from water treatment technology vendors to evaluate effective dose rates for consideration in the design of a dredge return water treatment system. In some cases, bulk sediment and Site surface water samples may be submitted to potential water treatment technology or treatment chemical vendors for off-site testing. Analytical tests of jar test supernatant will be performed at Apex as described in the QAPP (Appendix B of the IAWP) in coordination with Floyd|Snider personnel and water treatment vendors' protocols. Calibrated field instruments may be utilized for evaluation of some conventional water quality parameters (e.g., pH, conductivity, turbidity) in lieu of laboratory analysis of these parameters. Similarly, field treatability testing of bulk sediment to assess parameters such as physical stability and moisture retention for handling and disposal considerations will be performed. Results will be further evaluated in the Engineering Design Report.

6.0 References

U.S. Army Corps of Engineers. 2003. *Evaluation of Dredged Material Proposed for Disposal at Island, Nearshore, or Upland Confined Disposal Facilities—Testing Manual*. Environmental Laboratory ERDC/EL TR-03-1. January.

Washington State Department of Ecology (Ecology). 2021. *Sediment Cleanup User's Manual.* Publication No. 12-09-057. Originally published December 1991. Revised December 2021.

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix A

Table

Table A.1
Sample Locations, Coordinates, Core Target Depths, and Sample Analysis

Location Name	Sample Type	Core Depth (feet)	X Coordinate [1]	Y Coordinate [1]	Notes [2]	Sample Analysis				
						Total PCBs	Total PAHs	TOC	Total Solids	Grain Size
PDI-01-C	Core	8	1070721.3	121390.0	Archive	x			x	
PDI-02-C	Core	8	1070651.1	121344.1	Archive	x			x	
PDI-03-C	Core	8	1070659.3	121404.4		x		x	x	
PDI-03-SG	Grab	--	1070659.3	121404.4		x		x	x	
PDI-04-C	Core	8	1070592.3	121376.2		x		x	x	x
PDI-04-SG	Grab	--	1070592.3	121376.2		x		x	x	x
PDI-05-C	Core	8	1070613.6	121417.3		x		x	x	
PDI-06-C	Core	8	1070618.2	121473.2		x		x	x	
PDI-07-SG	Grab	--	1070525.0	121507.0		x		x	x	x
PDI-08-C	Core	8	1070537.8	121447.9		x			x	
PDI-09-SG	Grab	--	1070501.0	121395.9		x		x	x	x
PDI-10-SG	Grab	--	1070409.4	121432.3		x			x	
PDI-11-C	Core	6	1070403.4	121549.2		x		x	x	
PDI-11-SG	Grab	--	1070403.4	121549.2		x		x	x	
PDI-12-C	Core	6	1070345.8	121484.2		x			x	
PDI-13-C	Core	6	1070264.5	121513.6		x	x	x	x	
PDI-13-SG	Grab	--	1070264.5	121513.6		x	x	x	x	
PDI-14-C	Core	6	1070244.7	121578.3		x	x	x	x	
PDI-15-SG	Grab	--	1070190.8	121612.4		x	x		x	
PDI-16-C	Core	8	1070179.8	121480.2		x	x	x	x	
PDI-16-SG	Grab	--	1070179.8	121480.2		x	x	x	x	x
PDI-17-C	Core	8	1070163.9	121440.3	Archive	x	x		x	
PDI-18-C	Core	8	1070097.2	121421.7	Archive	x	x		x	
PDI-19-C	Core	8	1070116.4	121458.4		x	x		x	
PDI-19-SG	Grab	--	1070116.4	121458.4		x	x		x	
PDI-20-C	Core	8	1070066.9	121478.6	Archive	x	x		x	
PDI-21-C	Core	8	1070076.1	121524.5		x	x	x	x	
PDI-21-SG	Grab	--	1070076.1	121524.5		x	x	x	x	
PDI-22-C	Core	8	1070175.8	121522.9		x	x	x	x	x
PDI-23-C	Core	8	1070116.5	121562.3		x	x		x	
PDI-24-SG	Grab	--	1070076.6	121636.1		x	x		x	
PDI-25-C	Core	6	1070030.8	121646.4		x	x		x	
PDI-26-SG	Grab	--	1070015.9	121605.4		x	x	x	x	
PDI-27-SG	Grab	--	1069972.6	121504.6		x			x	
PDI-28-SG	Grab	--	1069934.9	121555.6		x			x	
PDI-29-SG	Grab	--	1069975.4	121650.3		x			x	
PDI-30-C	Core	6	1069850.9	121619.9	Archive	x			x	
PDI-31-SG	Grab	--	1069850.4	121684.2		x		x	x	
PDI-32-SG	Grab	--	1069810.9	121765.8		x		x	x	
PDI-33-SG	Grab	--	1069780.2	121678.7		x			x	
PDI-34-C	Core	6	1069684.7	121628.9	Archive	x			x	
PDI-35-C	Core	6	1069693.2	121694.5		x			x	
PDI-35-SG	Grab	--	1069693.2	121694.5		x		x	x	
PDI-36-C	Core	4	1069694.2	121754.0		x		x	x	x
PDI-37-SG	Grab	--	1069678.7	121801.3		x		x	x	
PDI-38-SG	Grab	--	1069592.2	121739.1		x			x	
PDI-39-SG	Grab	--	1069475.9	121729.7		x	x	x	x	
PDI-40-SG	Grab	--	1069488.5	121836.1		x	x		x	
PDI-41-SG	Grab	--	1069433.1	121883.8		x	x	x	x	
PDI-42-C	Core	8	1069435.3	121820.2		x	x		x	
PDI-43-C	Core	8	1069389.1	121766.0	Archive	x	x		x	
PDI-44-C	Core	8	1069363.2	121827.9		x	x	x	x	
PDI-44-SG	Grab	--	1069363.2	121827.9		x	x		x	
PDI-45-SG	Grab	--	1069376.4	121910.2		x	x	x	x	x
PDI-46-C	Core	8	1069341.7	121880.1		x	x		x	x
PDI-47-C	Core	8	1069311.3	121871.3		x	x		x	x
PDI-48-SG	Grab	--	1069271.7	121833.2		x	x		x	
PDI-49-SG	Grab	--	1069288.2	121783.6		x	x		x	
PDI-50-C	Core	6	1069260.7	121798.3		x	x	x	x	x
PDI-51-SG	Grab	--	1069229.0	121775.8		x	x	x	x	
PDI-52-SG	Grab	--	1069225.0	121834.2		x	x	x	x	
PDI-53-C	Core	8	1069224.0	121875.4		x	x	x	x	x
PDI-54-C	Core	8	1069295.3	121974.7		x	x	x	x	x
PDI-55-SG	Grab	--	1069244.0	121995.5		x	x		x	
PDI-56-C	Core	8	1069150.0	121934.4		x		x	x	
PDI-57-C	Core	8	1069143.1	121898.7		x		x	x	
PDI-58-SG	Grab	--	1068956.5	121953.4		x			x	
PDI-59-C	Core	6	1068917.9	121936.3		x		x	x	
PDI-60-SG	Grab	--	1068905.9	121919.4		x		x	x	x
PDI-61-SG	Grab	--	1068886.8	121951.3		x			x	
PDI-62-SG	Grab	--	1068912.5	121995.6		x		x	x	
PDI-63-SG	Grab	--	1068877.7	122122.7		x		x	x	x
PDI-64-SG	Grab	--	1068829.3	122148.0		x			x	
PDI-65-C	Core	6	1068870.3	122175.5		x		x	x	x
PDI-66-SG	Grab	--	1068823.7	122214.8		x		x	x	x
PDI-67-C	Core	6	1068726.4	122228.4		x	x		x	
PDI-68-C	Core	6	1068651.5	122276.9		x	x	x	x	

Notes:

-- Not applicable.

1 X and Y coordinates are in North American Datum of 1983 National Adjustment of 2011, State Plane Coordinate System Washington South Zone (EPSG 2286), U.S. Feet.

2 Samples from cores with the note Archive will be held at the lab for secondary analysis, based on adjacent preliminary results.

Abbreviations:

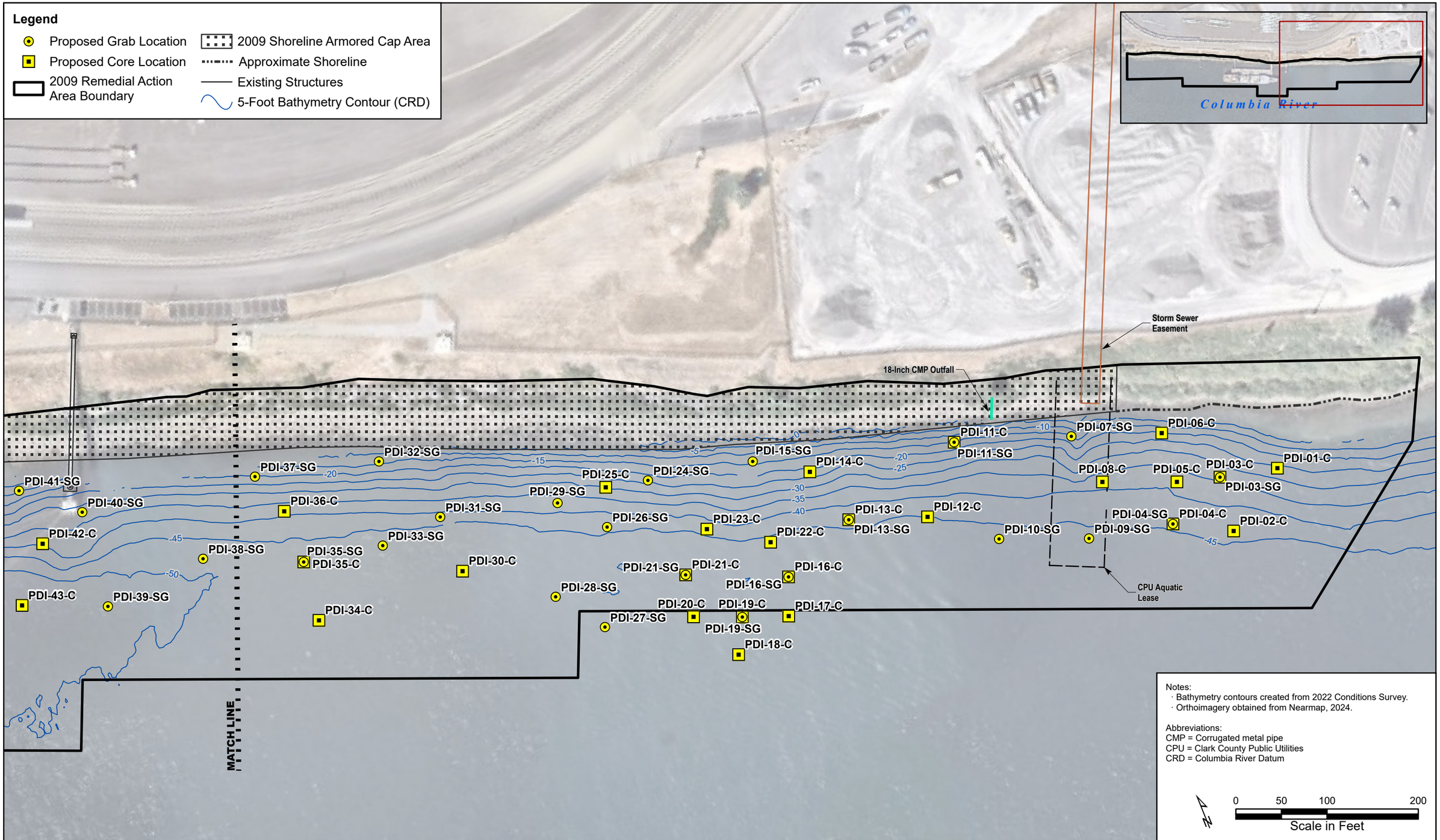
EPSG European Petroleum Survey Group
PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
TOC Total organic carbon

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix A

Figures



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Interim Action Work Plan
Port of Vancouver
Terminal 5 Alcoa Vancouver Site
Vancouver, Washington

Figure A.1a
Proposed PDI Grab and Core Sampling Locations

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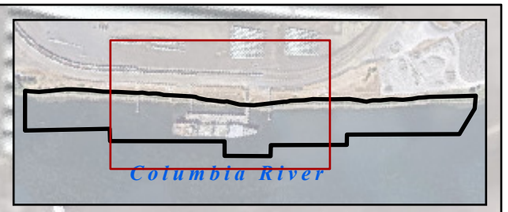
5/13/2025

Legend

- Proposed Grab Location
- Proposed Core Location
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Approximate Shoreline
- Existing Structures
- 5-Foot Bathymetry Contour (CRD)



PDI-68-C
PDI-67-C
PDI-66-SG
PDI-65-C
PDI-64-SG
PDI-63-SG
PDI-55-SG
PDI-54-C
PDI-45-SG
PDI-41-SG
PDI-40-SG
PDI-46-C
PDI-47-C
PDI-42-C
PDI-56-C
PDI-44-SG
PDI-53-C
PDI-62-SG
PDI-57-C
PDI-58-SG
PDI-48-SG
PDI-52-SG
PDI-43-C
PDI-39-SG
PDI-61-SG
PDI-59-C
PDI-50-C
PDI-49-SG
PDI-60-SG
PDI-51-SG
PDI-32-SG
PDI-37-SG
PDI-36-C
PDI-31-SG
PDI-33-SG
PDI-38-SG
PDI-35-C
PDI-30-C
PDI-35-SG
PDI-34-C
MATCH LINE

Notes:
· Bathymetry contours created from 2022 Conditions Survey.
· Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CRD = Columbia River Datum

0 50 100 200
Scale in Feet

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Interim Action Work Plan
Port of Vancouver
Terminal 5 Alcoa Vancouver Site
Vancouver, Washington

Figure A.1b
Proposed PDI Grab and Core Sampling Locations

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5/13/2025

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix A

Attachment A.1
Floyd|Snider Standard Guidelines for Sediment Sampling

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F|S STANDARD GUIDELINE

Sediment Coring and Processing

DATE/LAST UPDATE: May 2022

These procedures should be considered standard guidelines and are intended to provide useful guidance when in the field, but are not intended to be step by step procedures, as some steps may not be applicable to all projects.

All field staff should be sufficiently trained in the standard guidelines for the sampling method they intend to use and should review and understand these procedures prior to going into the field. It is the responsibility of the field staff to review the standard guidelines with the field manager or project manager and identify any deviations from these guidelines prior to field work. When possible, the project-specific Sampling and Analysis Plan should contain any expected deviations and should be referenced in conjunction with these standard guidelines.

1.0 Scope and Purpose

This sediment coring standard guideline should be used by the field staff performing sediment coring via vibracoring or Mud Mole for sediment sampling in freshwater or marine environments. The vibracore method works in a wide range of sediments but does not work as well in locations with known debris. The vibracore method assumes uniform recovery throughout the core. The Mud Mole method is diver-assisted and was initially developed to sample sediment containing wood debris. The Mud Mole method can provide a more accurate representation of stratification and reduce the chances of underestimating or overestimating contaminant depth, because it can use incremental interpolation to determine recovery in the core based on diver measurements recorded during the coring.

It is important that the field staff completing the sediment sample collection discusses the sediment logging needs for a particular investigation with the project geologist, the project manager (PM), or the person who will interpret the findings of the field investigation. This discussion is in addition to field training and general knowledge about sediment logging and sampling and should happen prior to entering the field, with additional follow-up before finalizing the field forms and logs, after the investigation is complete.

2.0 Equipment and Supplies

An equipment and supplies list for sediment coring and processing is provided as Attachment 1. Most sampling and safety supplies are available in the field room. You will need to purchase ice for cores and/or samples the day of the event. Additional considerations for preparing equipment and supplies are provided below.

Coring/Logging Equipment and Tools:

- Tape measures (one for on board vessel and multiple for processing), typically engineers scale (decimal feet) and/or use metric if project requires
- Duct tape and aluminum foil for sealing core tubes, if not provided by contractor
- Lead line (if not provided by vessel operator)
- Soil/sediment logging kit containing:
  - Small and large Ziploc bags
  - Small white board and dry-erase marker or note cards (for photographs)
  - Field guide for soil and stratigraphic analysis
  - Optional items from kit including: Munsell color chart, sieves, white and grayscale color cards for photographs
- Electric shears or saw for cutting cores (Contractor may provide, coordinate accordingly)
- Stainless steel bowls for homogenizing (of sufficient size for anticipated sample volume)
- Large stainless steel pot of adequate volume for large sample composites (e.g., for bioassay).
- Large and small stainless steel spoons or paddle mixer
- Stainless steel butter knives or cake cutters (can help to carefully split the core open)
  - Ensure you have sufficient metal or disposable knives such that a clean knife can be used to split the core along each sample interval.
- Aluminum foil (for covering bowls and creating a clean surface for decontamination)
- Folding tables (if not provided by subcontractor)
- 5-gallon buckets for collecting excess sediment
- Duct tape
- Alligator clips (clamps for plastic sheeting)
- If no power at the processing site, extension cord and generator if needed for core cutting equipment (typically assumed by subcontractor)

- Trash bags
- Plastic sheeting (for floor of core processing area and processing surfaces)
- Photoionization detector (PID) or MX6 multi-gas monitor (as needed or required for air monitoring)
- Hydrogen sulfide monitor (where high H_2S is expected, e.g., wood waste sites)
- Investigation-derived waste (IDW) drums including labels and socket wrench
- Decontamination equipment including:
    - Decontamination bins
    - Pump sprayer with tap water or hose with site water (initial rinse)
    - Spray bottles filled with Alconox/Liquinox type soap solution
    - Spray bottles or pump sprayer with distilled water
    - Scrub brushes
    - Alconox/Liquinox
        - Use phosphate-free soap solution (e.g., Liquinox) when working near bodies of water
    - Non-chlorinated solvent (as needed; e.g., for sites with expected NAPL)
    - Paper towels
    - Bins or 5-gallon buckets
- Boot wash station (shallow tub, brush, and sprayer), as needed (generally required at CERCLA sites)
- Camera
- Hand-held global positioning system (GPS; if GPS not on board vessel)
- Sample coolers (bring enough for ice and sample storage for the duration of program or have a plan for the laboratory to provide more)
- Laboratory-provided sample jars (inspect jars upon receipt from laboratory to ensure you have the proper type and amount per your sampling plan)
- Ice
    - Purchase day-of if you do not have access to on-site freezer.
    - If access to on-site freezer, consider using reusable ice packs provided by the laboratory.
- Packing tape
- Deionized water (laboratory grade, for rinsate blanks)
- Power source (if needed, e.g., portable generator)
- Location or equipment to store cores overnight (e.g., refrigerator or garbage bin)

Paperwork/Misc.:

- Work Plan and/or Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan
- Health and Safety Plan (HASP)
- Key figures and tables (laminated or printed on Rite in the Rain)
    - Sampling location coordinates in desired format for subcontractor (can provide to vessel subcontractor prior to mobilization)
- Tide prediction tables (Note: If your location is near an area with real-time tide data [e.g., Elliott Bay, Seattle], you may choose to save a link in your cell phone and reference it while in the field to have the most accurate tidal elevation.)
- Calculator (for determining percent sample recoveries)
- Subsurface sediment core collection and sampling forms, printed on Rite in the Rain paper and optional bound field notebook
- Sample labels (pre-printed is helpful if there are many samples/jars)
- Chain-of-custody forms and seals
- Rite in the Rain pen, permanent markers and pencils
- Field contact list (including PM, client contact, field team members, etc.)
- Copies of crew H&S certifications (if needed; e.g., for CERCLA sites)
- Copies of required permits

Additional Safety Equipment:

- Steel- or composite-toed boots
- Hard hat
- Life vest/personal flotation device
- Safety glasses
- Face shield (optional)
- Earplugs
- Nitrile gloves
- Long rubber gloves (for decontamination)
- Coveralls or Tyvek
- Rain gear
- Rain shelter for processing area
- Flagging or colored tape to delineate work zones

- Work gloves
- First aid kit
- Sunglasses and sunscreen
- Traffic barricades or cones, if needed
- Hand warmers

3.0 Standard Procedures

3.1 OFFICE PREPARATION

First, meet with the PM to identify key information and goals of the sediment sampling investigation. These may include fill/capping/dredging history, known or suspected sources of contamination and potential field indications of these contaminants, and identification of specific units, if applicable. Select a coring log template that is appropriate for the method (i.e., vibracore or Mud Mole; note that Mud Mole logs are typically produced by the subcontractor after the core has been driven). Also discuss the appropriate level of detail for sediment descriptions and logging that meets the goals of the sediment characterization.

Next, review the work plan and existing materials such as cross-sections, surface sediment grab forms, or sediment core logs from previous investigations to familiarize yourself with the site geology. A geologic map of the area from a reputable source such as the U.S. Geological Survey may also be reviewed if site-specific information about geology is not available, or in addition to site-specific information.

Talk with the PM about conducting a utility locate. Conduct necessary utility locate one-call for sampling locations. Note that utility locate contractors do not typically handle work on the water, and plan for adequate time before the event to submit a ticket via the local one-call system. You may need to follow up with individual contacts to provide more information. Request GIS layers or as-built utility maps if possible, which can be referenced against target sampling locations. Be sure you have cleared all sampling locations before you begin sampling.

If accurate sediment elevation data are critical to project success (i.e., dredge characterization, remedial design), discuss options with the PM and subcontractor before the field event on how to obtain accurate water levels. Certain subcontractors are equipped to obtain real-time water levels but need to know ahead of time that you need this capability. Additionally, actual (measured) tidal elevations are available for some locations online via the National Oceanic and Atmospheric Administration (NOAA) and can be updated by a support staff member in the office but should be researched before the event. NOAA information is available online[1] and could be bookmarked on your phone for quick access in the field, if necessary. Some sites may have tidal

[1] https://tidesandcurrents.noaa.gov/

gauges, which should be used when present. Note that predicated and actual tidal elevations are often different.

3.2 TAILGATE SAFETY MEETING

Conduct a tailgate safety meeting prior to beginning work at the site. The safety meeting should cover the hazards specific to sediment core sampling. Typical hazards include the following:

- Traffic when mobilizing to and from the site
- Site hazards on sampling vessel:
  - Drowning
  - Slips, trips, and falls (wet vessel surface, equipment on the vessel, etc.)
  - Heavy equipment
  - Splash hazards from water
  - Overhead hazards and pinch points
  - Pinch points that could crush hands, feet, or whole body
- Sampling setup and processing:
  - Lifting heavy coolers and buckets
  - Sharp blades
  - Flying metal/debris when opening cores
  - Sharp core tube edges
  - Slips, trips, and falls (wet ground surface, equipment, tools, electrical cables, etc.)
  - Biological (insects, animals, plants)
- Chemical hazards (refer to HASP for site chemical exposure hazards)

Record the meeting attendees and topics discussed on the front page of the tailgate safety meeting form. All attendees should sign the form.

The marine subcontractor may conduct their own safety briefing and/or should review key safety items relevant to their vessel and equipment (extra life preservers, fire extinguisher, first aid kit, etc.). Field staff should participate and sign their safety form (if requested).

3.3 OTHER HEALTH AND SAFETY GUIDELINES

The following are additional health and safety guidelines that should be followed in the field. These guidelines are intended to supplement the guidelines and requirements identified in the HASP and are not intended to replace the HASP.

- Review and sign the HASP prior to going out into the field.
- Conduct a tailgate safety meeting prior to beginning work at the site as discussed in Section 3.2.

- When moving between coring locations or switching to different sampling tasks (e.g., sample processing to decontamination), assess any additional hazards that may be associated with the new location or task. Record additional hazards noted and corrective actions to address those hazards on the Daily Tailgate Safety Meeting and Debrief Form.
- Record near misses and incidents on the Near Miss and Incident Reporting Form (included as an attachment to the HASP).

3.4 COLLECTING SEDIMENT CORES

All working surfaces and instruments will be thoroughly cleaned and decontaminated prior to core or sample collection and between coring locations. Sediment core collection typically will occur from a vessel, although short cores in shallow water may be collected by hand. The procedures that follow have been generalized to apply to all coring methods; however, method-specific coring procedures should be detailed in the project SAP.

1. Before starting, fill out the core collection forms with the general project information: vessel operator, coring method, sampler length/diameter, station ID, project ID and date
2. Ensure the marine contractor has decontaminated core tubes and core caps.
3. Have the boat operator maneuver the vessel to the proposed coring location. Locations will be, in most situations, pre-determined in northings and eastings (to the nearest US survey foot) referenced to the appropriate state plane system for the site, using the vessel-mounted digital global positioning system (DGPS) receiver referenced to North American Datum of 1983 (NAD 83). If there is no vessel-mounted DGPS available, a handheld portable GPS may be used.
4. Record the time, water depth (to mudline), water level, and actual sample location coordinates.
    A. At tidally influenced areas, water level will typically be the predicted or real-time tide elevation for the general area. Tide elevation is time sensitive and may need to be updated if the core collection process is delayed.
    B. At non-tidally influenced water bodies (lakes), water level will typically reference a surveyed water gauge located in the area.
    C. Before going into the field, discuss project objectives and how to obtain the necessary water level information with your PM and/or contractor. Ensure you are collecting measurements in the correct vertical datum (e.g., feet mean lower low water [MLLW] or feet North American Vertical Datum of 1988 [NAVD 88]).

5. Calculate your sediment mudline elevation via the following equation:

   Mudline = Water Level – Water depth

   Example Calculation:

   Water level is +2 feet MLLW using predicted tide chart.

   Water depth measured via lead line is 20 feet.

   Mudline = +2 feet MLLW – 20 feet

   Mudline = -18 feet MLLW

6. If coring to a target elevation, calculate the total core length needed using the mudline elevation and inform the boat operator. You would typically aim to collect approximately 2 feet beyond your target sample depth when possible to allow for a buffer of extra sample material to be collected below the target depth. The core length is the difference between the mudline elevation and the target elevation plus a 2-foot buffer:

   Core Length = (Mudline Elevation – Target Elevation) + 2-foot buffer

   Example Calculation:

   Mudline elevation is -18 feet MLLW.

   Target elevation is -25 feet MLLW.

   Core length = -18 – (-25) = -18 + 25

   Core length = 7 feet + 2-foot buffer = 9 feet

7. When the core is collected, record the actual sample location coordinates (should be collected above coring location). Coordinates are typically saved by the boat operator and provided at the end of the event; however, this information should also be recorded on the field form as backup.
8. The vessel operator will advance the core sampler to the target depth as directed by the field lead or until refusal.
   A. If using a diver-assisted coring method, the diver may relay measurements of recovered sediment in the core tube. Record the core tube drive depth on the field form.
9. Take note of any penetration information that you can obtain from the core operator (easy to difficult penetration); this can help inform sediment lithologies and obstructions.
10. The vessel operator will retrieve the core by raising the sampler at a slow and controlled rate and guide the core sampler on board without disturbing the integrity of the core.

11. Once on board the vessel, the recovered length of the core in the core tube is measured and recorded on the field form. Then, percent recovery is calculated as the core recovery length divided by the penetration depth.
12. Cores will be accepted based on the following criteria:
    A. The core does not contain significant debris material or obstructions that may have blocked the subsequent entry of sediment into the core tube and resulted in incomplete core collection.
    B. Percent recovery is acceptable (typically 50% to 75%) for testing purposes, or as specified in the sampling plan. It is important to note that for characterization of sediments at a targeted elevation, and especially for characterization of a post-dredge z-layer, core recovery should be at least 75%. If core recovery is consistently less than 75%, adjustment to the acceptable recovery range should be coordinated with the PM and/or overseeing agency for approval.
    C. Cored material does not extend out the top of the core tube or contact any part of the sampling apparatus at the top of the core tube.
    D. A core depth acceptable to the field lead or project-specific work plan has been achieved.
13. If the core criteria are not achieved, the core will be rejected and another core will be collected adjacent to the original sample location. The core tube from the rejected sample may be decontaminated and re-used unless otherwise specified in the sampling plan. Repeat the core sampling process within a 10-foot radius of initial coring location (or within a radius specified in the sampling plan) until sufficient sample volume is obtained for chemical and/or biological analyses at each location.
14. If refusal is encountered, relocate the core within a 10-foot radius of the target location, or within a radius specified in the sampling plan.
15. Care should be taken during sampling to avoid contact of the sample tube with potentially contaminated surfaces. Extra sample core tubes and/or liners will be available during sampling operations for uninterrupted sampling in the event of a potential core tube/liner breakage or contamination.
16. Upon bringing the core barrel on board the vessel, it is typical to cap the bottom of the core tube with a decontaminated core cap (this step is often performed by the coring subcontractor and may vary by collection method). Store the core vertically or angled upward until suspended sediments above the sample have settled and then siphon excess water from the top of the core.
17. Cores collected utilizing a soft inner plastic liner are typically left inside the core barrel until processing. Longer cores collected within hard polycarbonate or aluminum core tubes can be trimmed to size and capped at the top with clean aluminum foil and a decontaminated core cap. The capped ends should be further secured with duct tape.
18. The intact core or core sections (if cut into sections on board the vessel) will be labeled with the station ID, section name (if applicable), and “top” and/or “bottom.”

3.5 SEDIMENT CORE SAMPLE PROCESSING

Processing of sediment cores may occur on the vessel if there is adequate space or at an upland processing location. The procedures for core processing vary depending on the coring method. The procedures that follow have been generalized to apply to all coring methods; however, method-specific coring procedures should be detailed in the project SAP.

1. Before core processing, discuss the appropriate level of detail for sediment characterization with the PM and any project-specific terminology. Example descriptions are provided in Step 7.
2. Depending on the coring method, either cut the core tube longitudinally with the appropriate electric core cutter, saw, or power shears provided by the contractor. Soft plastic liners can be cut utilizing a box cutter or power shears. For all core types, care should be taken to not to penetrate the sediment while cutting.
3. Measure the total core tube length and the length of recovered sample to calculate percent recovery to confirm that an acceptable core has been obtained (i.e., sufficient material is present for characterization). For example, for a 5-foot core tube section containing 4 feet of sediment, your recovery is 80% (4/5). Note the percent recovery on the sediment sampling processing form. This number may be different than the percent recovery measured on the boat during core collection.
    A. If the percent recovery measured is not acceptable, coordinate with the PM to determine if the core can be sampled.
    B. For some coring setups, material retained within the bottom "core nose" can be included in recovery percentages and for logging purposes but is typically excluded from sampling due to difficulty in extracting.
    C. For some coring methodologies, penetration and sample recovery measurements may be collected for sub-segments of the total driven length of the core (i.e., incremental recovery measurements). In this instance, recovery percentages are calculated as described above for each sub-segment.
4. Identify/delineate sampling intervals. If the SAP prescribes compaction correction, adjust the sample intervals based on the percent recovery measured in Step 3.[2] Record the recovered lengths and corrected lengths on the core processing form. Mark these intervals on the core tube barrel or next to the liner.
    A. For a core with 80% recovery, 1 foot of penetrated depth would correspond to 0.8 feet of recovered sediment.
        i. If the target sample interval is 0- to 1-foot, you would collect a sample from 0- to 0.8-feet.[3]

[2] Compaction correction is project specific and is not allowed by some agencies. Additionally, compaction correction is not typically allowed in California.

[3] Compaction correction is conducted because sediment, especially sand, compacts during the coring process. To account for the compaction of the sample in the core barrel, the target sample interval is expanded so that the sample represents the "true" depth of the target interval.

ii. If the target sample interval were 10 to 12 feet below mudline, you would collect a sample from 8.0 to 9.6 feet.

B. If your target interval for sample collection is a specific elevation range (e.g., a theoretical post-dredge leave surface), determine the depth of the compaction-corrected sample interval as follows: Subtract the target elevation from the mudline elevation. Then, if using compaction correction, multiply by the percent recovery.

Mudline elevation is -5.0 feet MLLW.

Target Sample Depth is -8 feet MLLW to -10.0 feet MLLW.

Percent recovery of attempt is 80%.

Example Calculation Without Compaction Correction:

Upper Sample Bound = Mudline – Upper Target Elevation

Upper Sample Bound = -5.0 – (-8.0) = -5.0 + 8.0

Upper Sample Bound = 3 feet (measured from top of core)

Lower Sample Bound = Mudline – Lower Target Elevation

Lower Sample Bound = 5 – (-10) = -5 + 10

Lower Sample Bound = 5 feet (measured from top of core)

Example Calculation With Compaction Correction:

*Upper Sample Bound = (Mudline – Upper Target Elevation) * Recovery*

Upper Sample Bound = (-5.0 – (-8.0)) * 0.8 = (-5.0 + 8.0) * 0.8

Upper Sample Bound = 2.4 feet (measured from top of core)

*Lower Sample Bound = (Mudline – Lower Target Elevation) * Recovery*

Lower Sample Bound = (-5 – (-10)) * 0.8 = (-5 + 10) * 0.8

Lower Sample Bound = 4 feet (measured from top of core)

5. Take a digital photograph of the sediment within the core prior to disturbance with recovered depths delineated with a measuring tape (typically using an engineer's scale in decimal feet). Write the core location name and core replicate number with a marker on a white board or sheet of paper (or similar) and photograph next to, but not touching, the sediment. It can be helpful to write the sample intervals next to the measuring tape so that this information is documented.
6. Collect sample volume for volatile organic compounds (VOCs) or sulfides, prior to disturbing the core for characterization or other sampling (or as specified in the sampling plan).

7. Record the description of the core sample on the sediment core processing log form with appropriate level of detail as discussed with the PM.
   A. Sample recovery (depth in decimal feet of penetration and length of recovered sediment)
   B. Visual classification of sediments according to United Soil Classification System (ASTM D2487) and describing sediments using visual-manual procedures (ASTM D2488). Refer to the Soil Classification section of the Floyd|Snider Soil Logging Standard Guideline. Logging procedures for upland soils and in-water sediments generally follow the same guidelines.
   C. Descriptors including the following:
      i. Depth of contact with native material, if distinguishable
      ii. Odor (hydrogen sulfide, petroleum, etc.), typically qualified as slight, moderate, or strong
      iii. Vegetation/organics (e.g., seaweed, sticks), anthropogenic debris (e.g., concrete, glass, wood chips, sawdust), or biota (e.g., detritus, shells, tubeworms, or other organisms), typically qualified as trace, occasional, moderate, or substantial
      iv. Presence of oil sheen or obvious contamination; typical sheen qualifiers include the following:
         a. Amount (slight, moderate, or heavy)
         b. Oily or blocky (blocky sheens are often biological in origin)
         c. Color (silver, rainbow, or other)
      v. Any other distinguishing characteristics or features

      Example Sediment Descriptions:

      a. Loose, dark gray, poorly graded SAND (SP), 95% fine to medium sand, 5% fines, trace gravel (subrounded up to 2 inches), moist. Moderate biota (shell hash and worms), trace organics (sticks).
      b. Very loose, brown, silty SAND (SM), 80% medium to coarse sand, 20% fines, trace fine gravel (subrounded), wet. Slight hydrocarbon odor. Sheen Test: trace rainbow sheen.[4]
      c. Soft, dark gray, sandy SILT with gravel (ML), 65% fines, 20% medium coarse sand, 15% fine gravel, moist. Occasional organics (wood fibers) and anthropogenic debris (plastic fragments).
8. Using a clean stainless steel spoon, place material from the desired sample interval into a decontaminated stainless steel bowl (taking care not to collect sediment from

[4] Refer to Soil Logging Standard Guideline Section 3.4 for description of sheet test.

the sides of the core—even if using a plastic liner) and homogenize until a consistent color and texture are achieved.

9. Using a decontaminated, stainless steel spoon, completely fill pre-labeled sample containers. Immediately place the lids on containers and tighten. Wipe any excess sediment off the container and place the sample label onto the container. Cover the label with clear tape or place the container into a Ziploc bag to protect the label from water damage and becoming illegible. Sediment sample containers that will be archived frozen may expand and should not be completely filled to avoid breaking the jar.
10. If you are containerizing waste as IDW (Section 5.0), you may wish to collect a running sediment composite with representative aliquots of all material containerized as IDW. At the end of sample processing, homogenize this sample and submit an IDW composite sample to the laboratory and analyze for the required parameters for IDW characterization (per the sampling plan). Check with the PM whether this sample analytical data may suffice for IDW characterization.
11. Place the sample container in a cooled ice chest. The cooled ice chest will be maintained at 4 °C.
12. Ensure that sediment descriptions and supporting field form entries are complete.
13. Complete the chain-of-custody and check the cooler(s) to ensure that all samples on the chain-of-custody are present in the coolers. Transport samples to analytical laboratory under standard chain-of-custody procedures.
14. Manage excess sediment waste as IDW in accordance with the project SAP. Refer to Section 5.0 for additional IDW management procedures.

4.0 Decontamination

All reusable equipment that comes into contact with sediment should be decontaminated as follows prior to moving to the next sampling location.

Stainless steel bowls and spoons, sediment samplers, and any other tools used for sampling must be decontaminated between sample locations. Equipment decontamination will generally consist of a preliminary water rinse using water from the site to remove sediment particles, followed by scrubbing with brushes and a laboratory-grade anionic detergent (e.g., Alconox)/ clean water solution and a final rinse with distilled or deionized water. Use phosphate-free soap solution (e.g., Liquinox) when working near bodies of water. Additional use of specific solvents (typically ethyl acetate) to decontaminate equipment that comes into contact with non-aqueous phase liquid (NAPL) may be needed. Refer to the project SAP for any additional project-specific decontamination protocols.

Decontaminated items should be placed on a clean surface to avoid any recontamination, typically a surface lined with clean aluminum foil. Decontaminated items can also be placed in a larger decontaminated vessel (like a bowl) and covered with a lid or foil.

5.0 Investigation-Derived Waste

Waste sediment, decontamination water, and rinse water generated during sediment coring activities should be disposed of in accordance with the project SAP. Disposal of subsurface sediment overboard the sampling vessel is not common, but if approved, should only be returned to the site by disposing of material overboard the vessel as close to the sample location as possible. Typically, you should plan to containerize excess sediment waste.

Waste sediment should be containerized in 55-gallon drums approved by the U.S. Department of Transportation pending profiling and disposal. Each container holding IDW will be sealed and labeled as to its contents (e.g., "sediments"), the waste accumulation dates, the waste generator name (site owner or client name) and contact information for the Floyd|Snider field person who generated the waste, and the site name.

IDW containerized within drums will be characterized relative to applicable waste criteria using data from an IDW sample composite or the sampling locations. If decontamination/rinse water is collected as IDW, a sample composite may need to be collected from the drum to accurately characterize this medium. Material that is designated for off-site disposal will be transported to an off-site facility permitted to accept the waste. Manifests will be used as appropriate for disposal. Sediment and decontamination/rinse water should be containerized in separate drums.

Disposable sampling materials and incidental trash such as paper towels and personal protective equipment (PPE) used in sample processing will be placed in heavy duty garbage bags or other appropriate containers and disposed of as solid waste in the municipal collection system (i.e., site dumpster) or as prescribed in the SAP. At some contaminated sites, PPE may need to be containerized as IDW.

6.0 Field Documentation

All observations should be recorded on the appropriate sediment sample forms and/or in a bound field notebook. Field staff should make an effort to record as much detail as possible.

At the end of each day, complete and review the second page of the tailgate safety meeting form detailing additional hazards, corrective actions, near-misses, or incidents. Fill out the Near Miss and Incident Reporting Form if applicable. Any incidents that result in equipment damage or field staff injuries should be reported immediately to the PM according to Floyd|Snider's Accident Prevention Plan.

7.0 Demobilization

Upon returning to the office, ensure that all equipment is property cleaned and put away in the field room. Equipment with rechargeable batteries should be plugged in as appropriate. It is preferable to dispose of trash on-site, but any trash left in the field vehicle should be placed in an appropriate municipal trash container or labeled and left at an arranged location for pickup.

If rented equipment or sample coolers will be placed at the front desk for pickup, clearly label each item with the name of laboratory/courier picking it up, anticipated pickup time frame, and your contact information so front desk staff can contact you if there are any questions. Ensure that sample coolers to be picked up remain sealed to maintain chain of custody. Notify front desk staff if any items require a signature at pickup.

Within 1 week of returning from the field, the PM for the event will provide copies of near miss and incident reports to the Health and Safety Administrator.

Within 1 week of returning from the field, the field lead for the event should complete the following tasks:

- Review field notes, sampling forms, and tailgate safety meeting forms with the PM.
- Scan field notes and forms and save to the project folder.
- File hard copies of the field forms, as required by the project or necessitated by project needs.
- Fill out the Event Tracking Form (ETF) and data standardization worksheet if applicable (available on the Data Services SharePoint page).
- Fill out and submit the equipment invoice (available on the Field SharePoint page) and submit to the PM for review.

Enclosures: Sediment Coring Equipment Checklist
Subsurface Sediment Core Collection Form
Subsurface Sediment Core Processing Form

Sediment Coring Equipment Checklist

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Sediment Coring Equipment (Vessel)
- Measuring tape (decimal ft and/or decimal)
- Core caps
- Lead line (if contractor not providing)

Sediment Processing Equipment
- Plastic folding table(s)
- Sunshade or rain shelter (including gear to tie/weigh down if windy)
- Plastic sheeting (to cover tables)
- Ground cover (to cover ground)
- Clamps for plastic sheeting
- Camera
- Whiteboard, whiteboard pens, dry erase marker; or note cards
- Measuring tape (decimal ft and/or metric)
- Field guide for soil and stratigraphic analysis
- Munsell chart, sieves, white/grayscale color cards (as needed)
- Extension cord
- Stainless steel bowls for homogenizing
- Large stainless steel pot for homogenizing (larger samples)
- Large stainless steel spoons
- Small stainless steel spoons
- Butter knife for cutting cores (aluminum)
- Paddle mixer and drill
- Electric sheers for cutting core (plastic)
- Portable generator
- Location for storing cores overnight (as necessary, e.g., refridgerator or bin)

Decontamination/IDW Equipment
- Decontamination bins or 5-gallon buckets
- Pump sprayer for tap water or site water
- Spray bottles filled with Alconox/Liquinox solution
- Distilled water
- Non-chlorinated solvent (as needed; e.g., for sites with expected NAPL)
- Paper towels
- Alconox/Liquonox
- Scrub brushes
- Waste labels for drums and buckets
- Full length rubber gloves
- IDW drums (including socket wrench)

CERCLA Sediment Sites (if needed)
- Bootwash gear for CRZ (tub, brush, sprayer)
- Flagging/colored tape to delineate work zones
- Copies of crew H&S certs

Plans and Forms (2x copies if needed for 2 teams)
- Work Plan, SAP/QAPP, HASP
- Work permits
- Key Tables, Figures, and Coordinates (on RiR)
- Field forms
- Field notebook
- Tide prediction tables
- Calculator

Sample Handling
- Coolers (extra cooler for ice)
- Ice
- Chain of custody forms and seals
- Sample labels
- Packing tape
- Small/large Ziploc bags for ice and samples
- Sample jars
- Deionized water (for rinsate blanks)

Safety Equipment (default to HASP)
- PID or MX6 and hydrogen sulfide monitor
- Life vest
- Coveralls or Tyvek
- Nitrile gloves
- Steel- or composite-toed boots
- Hard hat
- Safety glasses, face shield (for core opening with saw)
- Rain gear
- Work gloves
- First aid kit
- Hand warmers
- Sunglasses and sunscreen
- External battery charger for phone
- Waterproof case for cell phone
- Traffic barricades or cones (if needed)

General (Boat and Processing)
- Trash bags
- Paper towels
- Duct tape
- Permanent markers (large and small point) and pencils
- Rite in the Rain pen
- Box cutter
- Scissors
- Aluminum foil
- 5-gallon buckets
- Zip ties
- Handhed GPS (if needed)
- Rain shelter

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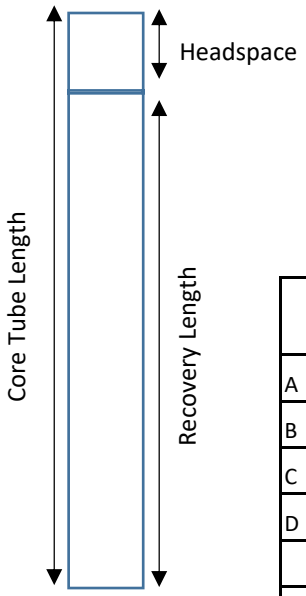
SUBSURFACE SEDIMENT CORE COLLECTION FORM Page ___ of ___

Project:	**Location ID:**
Field Staff:	**Date:**
Contractor:	**Weather:**
Sampling Method:	**Logged by:**
Horizontal/Vertical Datum:	
Attempt No:	
Field Coordinates:	
Lat/Northing:	Long/Easting:
(A) Water Depth	**(B) Water Level**
Leadline :	Tide Elevation: Pred. / Actual
Sounder:	Time:
Calculated Mudline Elevation (B-A):	**Target Core Length:**

Core Collection Information
Core Accepted: Y / N
Drive Penetration (D):
Core Tube Length:
Headspace Length:
Recovery Length (E):
Percent Recovery (E/D*100):
Drive Notes (e.g., easy/hard for respective depth interval)



Section ID / Length	Approx Depth Interval
A	
B	
C	
D	

Sediment Description (at core cuts) sediment type, density, moisture, color, minor constituents, major constituents, minor constituents, odor, sheen, organics, shells, biota)

Notes:

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SUBSURFACE SEDIMENT CORE PROCESSING FORM Page ___ of ___

Project:	**Station ID:**
Date/Time:	**Attempt #:**
Logged by:	**No. of Sections:**
Drive Length:	**Core Diameter:**
Recovered Length:	**Coring Method:**
Percent Recovery:	**Mudline Elevation:**

Notes:

Recovered Length (ft)	In-situ Length (ft)	Sediment Description (See Reference Logging Guide. Include description of sediment type, density, moisture, color, minor constituents, major constituents, odor, sheen, organics, shells, biota):	PID	Sample ID and Analyses	Lithology Sketch

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F|S STANDARD GUIDELINE

Sediment Grab Sample Collection

DATE/LAST UPDATE: May 2022

These procedures should be considered standard guidelines and are intended to provide useful guidance when in the field, but are not intended to be step by step procedures, as some steps may not be applicable to all projects.

All field staff should be sufficiently trained in the standard guidelines for the sampling method they intend to use and should review and understand these procedures prior to going into the field. It is the responsibility of the field staff to review the standard guidelines with the field manager or project manager and identify any deviations from these guidelines prior to field work. When possible, the project-specific Sampling and Analysis Plan should contain any expected deviations and should be referenced in conjunction with these standard guidelines.

1.0 Scope and Purpose

These sediment grab standard guidelines should be used by the field staff performing sediment grab sampling via a grab type sampler (e.g., van Veen, Power Grab) sampler for sediment sampling in freshwater or marine environments. Power Grab samplers are often used when requiring collection of sediment deeper than 10 centimeters (cm; 4 inches) or in areas with debris.

It is important that the field staff completing the sediment sample collection discusses the sediment logging needs for a particular investigation with the project geologist, project manager (PM), or the person who will interpret the findings of the field investigation. This discussion is in addition to field training and general knowledge about sediment logging and sampling and should happen prior to entering the field, with additional follow-up before finalizing the field forms, after the investigation is complete.

2.0 Equipment and Supplies

An equipment and supplies list for sediment sampling is provided as Attachment 1. Most sampling and safety supplies are available in the field room. You will need to purchase ice for

samples the day of the event. Additional considerations for preparing equipment and supplies are provided below.

Sampling Equipment and Tools:

- Stainless steel ruler (with inch/cm and of sufficient length for grab depth, at least 1 foot); no cork or other non-steel backing
- Lead line (if not provided by vessel operator)
- Soil/sediment logging kit containing:
  - Small and large Ziploc bags
  - Small white board and dry-erase marker or note cards (for photographs)
  - Field guide for soil and stratigraphic analysis
  - Optional items from kit including: Munsell color chart, sieves, and white and grayscale color cards for photographs
- Stainless steel bowls for homogenizing (of sufficient size for anticipated sample volume)
- Large stainless steel pot of adequate volume for large sample composites (e.g., for bioassay)
- Large and small stainless steel spoons or paddle mixer
- Aluminum foil (for covering bowls, and creating clean surface for decontamination)
- Trash bags
- Duct Tape
- Alligator Clips (clamps for plastic sheeting)
- Photoionization detector or MX6 multi-gas monitor (as needed or required for air monitoring)
- Hydrogen sulfide monitor (where elevated hydrogen sulfide gas is expected; e.g., wood waste sites)
- Decontamination equipment including:
  - Pump sprayer with tap water or hose with site water (initial rinse)
  - Spray bottles filled with Alconox/Liquinox type soap solution
  - Spray bottle or pump sprayer with distilled water
  - Scrub brushes
  - Paper towels
  - Alconox/Liquinox

    - Use phosphate-free soap solution (e.g., Liquinox) when working near bodies of water
  - Non-chlorinated solvent (as needed; e.g., for sites with expected NAPL)
  - Bins or 5-gallon buckets
- Boot wash station (shallow tub, brush and sprayer), as needed (generally required at CERCLA sites)
- Siphoning hose (usually on board vessel) and turkey baster
- Camera
- Hand-held global positioning system (GPS; if GPS not on board vessel)
- Sample coolers (bring enough for ice and sample storage for the duration of program or have a plan for the laboratory to provide more)
- Laboratory-provided sample jars (inspect jars upon receipt from laboratory to ensure you have the proper type and amount per the sampling plan)
- Box cutter/scissors
- Packing tape
- Ice
  - Purchase day-of if you do not have access to an on-site freezer
  - If there is access to on-site freezer, consider using reusable ice packs provided by the laboratory.
- Deionized water (laboratory grade, for rinsate blanks)
- Investigation-derived waste (IDW) drums (project-dependent; including labels and socket wrench)
  - Additional sample jars/bottles for collecting IDW characterization sample
- Extension cords (as needed; i.e., for electric drill)

Paperwork:

- Work Plan and/or Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan
- Health and Safety Plan (HASP)
- Key figures and tables (laminated or printed on Rite in the Rain)
  - Sampling locations coordinates in desired format for subcontractor (can provide to vessel subcontractor prior to mobilization)
- Tide prediction tables (Note: If your sampling location is near an area with real-time tide data [e.g., Elliott Bay, Seattle], you may choose to save a link in your cell phone and reference it while in the field to have the most accurate tidal elevation.)

- Sediment grab sampling forms, printed on Rite in the Rain paper, and optional bound field notebook
- Sample labels (pre-printed is helpful if there are many samples/jars)
- Chain-of-custody forms and seals
- Rite in the Rain pen, permanent markers and pencils
- Field contact list (including PM, client contact, field team members, etc.)
- Copies of crew H&S certifications (if needed; e.g., for CERCLA sites)
- Copies of required permits

Additional Safety Equipment:

- Steel- or composite-toed boots
- Hard hat
- Life vest/personal flotation device
- Safety glasses
- Nitrile gloves
- Long rubber gloves (for decontamination or handling of IDW drums)
- Coveralls or Tyvek
- Rain gear
- Rain shelter
- Flagging or colored tape to delineate work zones
- Work gloves
- First aid kit
- Sunglasses and sunscreen
- Hand warmers

3.0 Standard Procedures

3.1 OFFICE PREPARATION

First, meet with the PM to identify key information and goals of the sediment sampling investigation. These may include fill/capping/dredging history, known or suspected sources of contamination and potential field indications of these contaminants, and identification of specific units, if applicable. Also discuss the appropriate level of detail for sediment descriptions and logging that meets the goals of the sediment characterization.

Next, review the work plan and existing materials such as surface sediment grab forms or sediment core logs from previous investigations to familiarize yourself with the site geology. A geologic map of the area from a reputable source such as the U.S. Geological Survey may also be reviewed if site-specific information about geology is not available, or in addition to site-specific information.

Talk with the PM about conducting a utility locate. Conduct necessary utility locate one-call for sampling locations. Note that utility locate contractors do not typically handle work on the water, and plan for adequate time before the event to submit a ticket via the local one-call system. You may need to follow up with individual contacts to provide more information. Request GIS layers or as-built utility maps if possible, which can be referenced against target sampling locations. Be sure you have cleared all sampling locations before you begin sampling.

If accurate sediment elevation data are critical to project success (i.e., dredge characterization, remedial design), discuss options with the PM and subcontractor before the field event on how to obtain accurate water levels. Certain subcontractors are equipped to obtain real-time water levels but need to know ahead of time that you need this capability. Additionally, actual (measured) tidal elevations are available for some locations online via the National Oceanic and Atmospheric Administration (NOAA) and can be updated by staff in the office but should be researched before the event. NOAA information is available online[1] and could be bookmarked on your phone for quick access in the field, if necessary. Some sites may have tidal gauges, which should be used when present. Note that predicated and actual tidal elevations are often different.

3.2 TAILGATE SAFETY MEETING

Conduct a tailgate safety meeting prior to beginning work at the site. The safety meeting should cover the hazards specific to sediment grab sampling. Typical hazards include the following:

- Traffic when mobilizing to and from the site
- Site hazards on sampling vessel
  - Drowning
  - Slips, trips, and falls (wet vessel surface, equipment on the vessel, etc.)
  - Heavy equipment
  - Splash hazards from water
  - Overhead hazards and pinch points
  - Lifting heavy coolers and buckets
- Chemical hazards (refer to HASP for site chemical exposure hazards)

Record the meeting attendees and topics discussed on the front page of the tailgate safety meeting form (included as an attachment to the HASP). All attendees should sign the form.

[1] https://tidesandcurrents.noaa.gov/

The marine subcontractor may conduct their own safety briefing and/or should review key safety items relevant to their vessel and equipment (extra life preservers, fire extinguisher, first aid kit, etc.). Field staff should participate and sign their safety form (if requested).

3.3 OTHER HEALTH AND SAFETY GUIDELINES

The following are additional health and safety guidelines that should be followed in the field. These guidelines are intended to supplement the guidelines and requirements identified in the HASP and are not intended to replace the HASP.

- Review and sign the HASP prior to going out into the field.
- Conduct a tailgate safety meeting prior to beginning work at the site as discussed in Section 3.2.
- When moving between grab sampling locations or switching to different sampling tasks (e.g., sample processing to decontamination), assess any additional hazards that may be associated with the new location or task. Record additional hazards noted and corrective actions to address those hazards on the Daily Tailgate Safety Meeting and Debrief Form (included as an attachment to the HASP).
- Record near misses and incidents on the Near Miss and Incident Reporting Form (included as an attachment to the HASP).

3.4 COLLECTING AND PROCESSING SEDIMENT GRAB SAMPLES

Sediment grab samples will typically be collected and processed on board the sampling vessel. Sediment grab samples may be processed at the shoreline where sample collection is not from a vessel (e.g., diver-assisted sample collection). All working surfaces and instruments will be thoroughly cleaned and decontaminated between sample locations.

1. Before starting, fill out the field form with the general project information:
   A. Sample Method (i.e., Van Veen, Power Grab) and Sample Type/Depth (e.g., 0 to 10 cm)
   B. Your name, date, project, weather, subcontractor, sample location ID name, and approximate descriptive location (if possible or applicable)
2. Have the boat operator maneuver the sampling vessel to the proposed sample location. Locations will be, in most situations, pre-determined in northings and eastings (to the nearest U.S. survey foot) referenced to the appropriate state plane system for the site, using the vessel-mounted digital global positioning system (DGPS) receiver referenced to North American Datum of 1983 (NAD 83). If there is no vessel-mounted DGPS available, a handheld portable GPS may be used.
3. Record the time, water depth (to mudline), water level, and actual sample location coordinates.

A. At tidally influenced areas, water level will typically be the predicted or real-time tide elevation for the general area. Tide elevation is time sensitive and may need to be updated if the sample collection process is delayed.

B. At non-tidally influenced water bodies (lakes), water level will typically reference a surveyed water gauge located in the area.

C. Before going into the field, discuss project objectives and how to obtain the necessary water level information with the PM and/or contractor. Ensure you are taking all measurements in the correct vertical datum (e.g., feet mean lower low water [MLLW] or feet North American Vertical Datum of 1988 [NAVD 88]).

4. Calculate your sediment mudline elevation via the following equation:

   Mudline = Water Level – Water Depth

   Example Calculation:

   Water level is +2 feet MLLW using predicted tide chart.

   Water depth measured via lead line is 20 feet.

   Mudline = +2 feet MLLW – 20 feet

   Mudline = -18 feet MLLW

5. If utilizing a grab sampler, once retrieved, examine the sample for the following sediment acceptance guidelines and note observations on field form:

   A. Sampler jaw is closed.

   B. The sampler is not overfilled such that the sediment surface is not pressed against the top of the sampler.

   C. Minimal leakage, as indicated by overlying water on the sediment surface (often not possible for coarse-grained sediments).

   D. Minimal sample disturbance, as indicated by low turbidity in the overlying water and relatively flat sediment surface (no winnowing).

6. If the sediment acceptance guidelines noted above are met, check that the sample recovery depth meets the projects requirements. Carefully insert a decontaminated stainless-steel ruler into the sediment to obtain the sediment recovery depth.

   A. The recovery depth should be at least 2.5 cm greater than the desired sample depth for grabs.

7. If sample acceptance guidelines are not achieved, the sample will be rejected and the location resampled after rinsing the sampler with site water. If the proposed sample location cannot be achieved (within ±10 feet, or within a distance specified in the sampling plan after the prescribed number of re-attempts), notify the Floyd|Snider PM to determine an appropriate alternate location.

8. Siphon off any standing water from the surface of the sediment using a hose primed with site water. Care should be taken not to disturb the integrity of the sediment surface.
9. Take a digital photograph of the sediment surface prior to removal from the sampler. Write the sample location ID and grab replicate or run number (e.g., Run #1) with a marker on a white board (or similar) and photograph next to, but not touching, the sediment sample.
10. Collect sample volume for volatile organic compounds or sulfides, prior to disturbing the grab for characterization or other sampling (or as specified in the sampling plan).
11. Record the description of the grab sample on the field form with appropriate level of detail as discussed with the PM.
    A. Grab recovery (depth in cm/inches)
    B. Visual classification of sediments according to United Soil Classification System (ASTM D2487) and describing sediments using visual-manual procedures (ASTM D2488). Refer to the Soil Classification Section of the Floyd|Snider Soil Logging Standard Guideline. Logging procedures for upland soils and in-water sediments generally follow the same guidelines.
    C. Descriptors including the following:
        i. Odor (hydrogen sulfide, petroleum, etc.), typically qualified as slight, moderate, or strong
        ii. Vegetation/organics (e.g., seaweed, sticks), anthropogenic debris (e.g., concrete, glass, wood chips, sawdust), or biota (e.g., detritus, shells, tubeworms, or other organisms), typically qualified as trace, occasional, moderate, or substantial
        iii. Presence of oil sheen or obvious contamination; typical sheen qualifiers include the following:
            a. Amount (slight, moderate, or heavy)
            b. Oily or blocky (note blocky sheens are often biological in origin)
            c. Color (silver, rainbow, or other)
        iv. Any other distinguishing characteristics or features
    D. Example Sediment Descriptions:
        i. Loose, dark gray, poorly graded SAND (SP), 95% fine to medium sand, 5% fines, trace gravel (subrounded up to 2 inches), moist. Moderate biota (shell hash and worms), trace organics (sticks).

ii. Very loose, brown, silty SAND (SM), 80% medium to coarse sand, 20% fines, trace fine gravel (subrounded), wet. Slight hydrocarbon odor. Sheen Test: trace rainbow sheen.[2]

iii. Soft, dark gray, sandy SILT with gravel (ML), 65% fines, 20% medium coarse sand, 15% fine gravel, moist. Occasional organics (wood fibers) and anthropogenic debris (plastic fragments).

12. Collect the surface sediment sample over the desired sampling depth (e.g., 0 to 10 cm) using a clean, stainless steel spoon and place the sample material into a clean stainless steel bowl. To prevent possible cross-contamination, do not collect sediments that are in direct contact with the sides of the sampler.

    A. Collecting multiple sample intervals from surface grabs may be utilized to characterize post-dredge surfaces and may be difficult in other soft sediments.

    B. If collecting a subsurface sediment sample as well, then collect sediment for this sample over the desired sampling depth (e.g., 10 to 20 cm) using a separate clean stainless steel spoon and place this sample material in a separate clean stainless steel bowl.

13. Homogenize until the sediment appears uniform in color and texture and distribute to appropriate sample containers. Take a digital photograph of each sediment sample in the bowl after homogenizing the sample and before sample collection. Write the sample location name, grab replicate number, and sample depth interval on a white board or index card (or similar) and photograph next to, but not touching, the sediment sample.

14. After wiping any excess sediment from the sample container, complete the sample labels,[3] attach them to the containers, and cover the sample label with clear tape. Sediment sample jars that will be archived frozen may expand and should not be completely filled to avoid breaking the jar.

    A. If there is insufficient sediment volume to fill sample containers, you may create a composite sample with additional grabs (or as directed by the sampling plan). Repeat Steps 1 through 11 at a new location within the prescribed distance from your sampling plan and label as subsequent Run # or Grab #. Equal volumes of sediment from each grab should be composited and homogenized prior to sample collection.

15. If you are containerizing waste as IDW (Section 5.0), you may wish to collect a running sediment composite with representative aliquots of all material containerized as IDW. At the end of sample processing, homogenize this sample, submit an IDW composite

[2] Refer to Soil Logging Standard Guideline Section 3.4 for description of sheen test.

[3] In some cases, it may be more efficient to pre-fill sample labels with project name and number, date of sampling, and sample ID prior to mobilization. Pre-filled labels may be attached to the containers prior to filling the jars with sample material.

sample to the laboratory, and analyze for the required parameters for IDW characterization (per the sampling plan). Check with the PM whether sample analytical data may suffice for IDW characterization.

16. Place the sample containers into a Ziploc bag to protect the label from water damage and becoming illegible. Store the samples in a cooler with ice away from the immediate work area. The samples should be maintained at 4 °C in the cooler.
17. Thoroughly rinse the interior of the sampler with site water until all loose sediment has been washed off, and decontaminate the sampler by following the procedures provided in Section 4.0.
18. Ensure that sediment descriptions and supporting field form entries are complete.
19. Complete the chain-of-custody and check the cooler(s) to ensure that all samples on the chain-of-custody are present in the coolers. Transport samples to the analytical laboratory under standard chain-of-custody procedures.
20. Manage excess sediment waste as IDW in accordance with the project SAP. Refer to Section 5.0 for additional IDW management procedures.

4.0 Decontamination

All reusable equipment that comes into contact with sediment should be decontaminated as follows prior to moving to the next sampling location.

Stainless steel bowls and spoons, sediment samplers, and any other tools used for sampling must be decontaminated between grab sample locations. Equipment decontamination will consist of a preliminary water rinse using water from the site to remove sediment particles, followed by scrubbing with brushes and a laboratory-grade anionic detergent (e.g., Alconox)/clean water solution and a final rinse with distilled or deionized water. Use phosphate-free soap solution (e.g., Liquinox) when working near bodies of water. Additional use of specific solvents (typically ethyl acetate) to decontaminate equipment that come into contact with non-aqueous phase liquid (NAPL) may be needed. Refer to the project SAP for any additional project-specific decontamination protocols

Decontaminated items should be placed on a clean surface to avoid any recontamination, typically a surface lined with clean aluminum foil. Decontaminated items can also be placed in a larger decontaminated vessel (like a bowl) and covered with a lid or foil.

5.0 Investigation-Derived Waste

Waste sediment and decontamination water and rinse water generated during sediment grab sampling activities should only be returned to the site by disposing of material overboard the vessel, as close to the sample location as possible, per the agency-approved sampling plan. Best practice is to have the contractor return the grab to near the mudline and open the jaws (if possible), so that you avoid creating a suspended sediment plume.

If required, waste sediment should be containerized in 55-gallon drums approved by the U.S. Department of Transportation pending profiling and disposal. Each container holding IDW will be sealed and labeled as to its contents (e.g., "sediments"), the waste accumulation dates, the waste generator's name (site owner's name or client name) and contact information for the Floyd|Snider field person who generated the waste, and the site name.

IDW containerized within drums will be characterized relative to applicable waste criteria using data from an IDW sample composite or the sampling locations. If decontamination/rinse water is collected as IDW, a sample composite may need to be collected from the drum(s) to accurately characterize this medium. Material that is designated for off-site disposal will be transported to an off-site facility permitted to accept the waste. Manifests will be used as appropriate for disposal. Sediment and decontamination/rinse water should be containerized in separate drums.

Disposable sampling materials and incidental trash such as paper towels and personal protective equipment (PPE) used in sample processing will be placed in heavy duty garbage bags or other appropriate containers and disposed of as solid waste in the municipal collection system (i.e., site dumpster), or as prescribed in the SAP. At some contaminated sites, PPE may need to be containerized as IDW.

6.0 Field Documentation

All observations should be recorded on the appropriate sediment sample forms and/or in a bound field notebook. Field staff should make an effort to record as much detail as possible.

At the end of each day, complete and review the second page of the tailgate safety meeting form detailing additional hazards, corrective actions, near-misses, or incidents. Fill out the Near Miss and Incident Reporting Form if applicable. Any incidents that result in equipment damage or field staff injuries should be reported immediately to the PM according to Floyd|Snider's Accident Prevention Plan.

7.0 Demobilization

Upon returning to the office, ensure that all equipment is property cleaned and put away in the field room. Equipment with rechargeable batteries should be plugged in as appropriate. It is preferable to dispose of trash on-site, but any trash left in the field vehicle should be placed in an appropriate municipal trash container or labeled and left at an arranged location for pickup.

If rented equipment or sample coolers will be placed at the front desk for pickup, clearly label each item with the name of laboratory/courier picking it up, anticipated pickup time frame, and your contact information so front desk staff can contact you if there are any questions. Ensure that sample coolers to be picked up remain sealed to maintain chain of custody. Notify front desk staff if any items require a signature at pickup.

Within 1 week of returning from the field, the PM for the event will provide copies of near miss and incident reports to the Health and Safety Administrator.

Within 1 week of returning from the field, the field lead for the event should complete the following tasks:

- Review field notes, sampling forms, and tailgate safety meeting forms with the PM.
- Scan field notes and forms and save to the project folder.
- File hard copies of the field forms, as required by the project or necessitated by project needs.
- Fill out the Event Tracking Form (ETF) and data standardization worksheet if applicable (available on the Data Services SharePoint page).
- Fill out and submit the equipment invoice (available on the Field SharePoint page) and submit to the PM for review.

Enclosures: Sediment Grab Equipment Checklist
Surface Sediment Sample Collection Form

Sediment Grab Equipment Checklist

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Surface Sediment Sampling Equipment
- Camera
- Whiteboard, whiteboard pens, dry erase marker (or note cards)
- Stainless steel ruler (with metric, at least 1 foot long)
- Lead line (if not provided by contractor)
- Siphoning hose
- Turkey baster
- Field guide for soil and stratigraphic analysis (as needed)
- Munsell color chart, sieves, white and grayscale (as needed)
- Stainless steel bowls for homogenizing
- Large stainless steel spoons and/or mixer adaptor to drill
- Small stainless steel spoons
- Large stainless steel mixing pot (for large composites)
Decontamination/IDW Equipment
- Decontamination bins or bucket
- Pump sprayer for tap water or site water
- Spray bottles filled with Alconox/Liquinox solution
- Distilled water
- Non-chlorinated solvent (as needed; e.g., for sites with expected NAPL)
- Paper towels
- Alconox/Liquinox
- Scrub brushes
- 5-gallon buckets
- Waste labels for drums and buckets
- Full length rubber gloves
- IDW drums (including socket wrench)
General (Boat and Processing)
- Trash bags
- Paper towels
- Duct tape
- Permanent markers (large and small point) and pencils
- Rite in the Rain pen
- Box cutter
- Scissors
- Aluminum foil
- 5-gallon buckets
- Zip ties
- Extension cords (as needed, ie. for electric drill)
- Alligator clips
- Handhed GPS (if needed)
- Rain shelter

Plans and Forms
- Work Plan, SAP/QAPP, HASP
- Contact information for field staff, PM, and client
- Work permits
- Key Tables, Figures, and Coordinates (on RiR)
- Field forms
- Field notebook
- Tide prediction tables

Sample Handling
- Coolers (extra cooler for ice)
- Ice
- Chain of custody forms and seals
- Sample labels
- Packing tape
- Small/large Ziploc bags for ice and samples
- Sample jars
- Deionized water (for rinsate blanks)

Safety Equipment (default to HASP)
- PID or MX6 and hydrogen sulfide monitor
- Life vest
- Nitrile gloves
- Coveralls or Tyvek
- Steel- or composite-toed boots
- Hard hat
- Safety glasses
- Rain gear
- Work gloves
- First aid kit
- Hand warmers
- Sunglasses and sunscreen
- External battery charger for phone
- Waterproof case for cell phone

CERCLA Sediment Sites (if needed)
- Copies of crew H&S certs
- Flagging/colored tape to delineate work zones
- Bootwash gear for CRZ if needed (tub, brush, sprayer)

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SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project:	**Location ID:**
Field Staff:	**Date:**
Contractor:	**Weather:**
Sampling Method:	**Logged by:**
Horizontal/Vertical Datum:	
Water Depth	**Water Level**
Leadline:	Tide Elevation: Pred. / Actual
Sounder:	Time:
Calculated Mudline Elevation (water level - depth):	

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth	Comments: jaws close, winnowing, overlying water, surface intact, etc.

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is relatively flat, 5) Desired sample depth is reached. If acceptance criteria are not met, reject sample.

Sediment Description (Reference logging guide. Include description of surface material, sediment type, density, moisture, color, minor constituents, major constituents, minor constituents, odor, sheen, organics, shells, biota):

Sample ID:	**Additional Notes:**
Sample Interval:	
Time:	
Sample Container Total Count:	

Container Type	Count	Analysis

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix B
Quality Assurance Project Plan

Table of Contents

1.0 Introduction B-1
1.1 DOCUMENT ORGANIZATION B-1
2.0 Project Organization and Responsibilities B-3
2.1 PROJECT MANAGEMENT B-3
2.1.1 Project Manager B-3
2.1.2 Field QA Officer B-3
2.1.3 Quality Assurance/Quality Control B-3
2.2 PROBLEM DEFINITION/BACKGROUND B-4
2.3 PROJECT TASK DESCRIPTION B-4
2.4 SPECIAL TRAINING/CERTIFICATIONS B-4
2.5 DOCUMENTATION AND RECORDS B-4
2.5.1 Laboratory Records B-4
2.5.2 Data Management and Reduction B-5
3.0 Data Generation and Acquisition B-7
3.1 DATA COLLECTION OBJECTIVES B-7
3.2 SAMPLING DESIGN AND ANALYTICAL DATA COLLECTION B-7
3.2.1 Surface and Subsurface Sediment Data Collection B-8
3.2.2 Bulk Sediment and Treatability Study Data Collection B-8
3.2.3 Sediment Analyses B-8
3.2.4 Bulk Sediment and Treatability Study Analyses B-8
3.2.5 Field Quality Control Analyses B-8
3.3 ANALYTICAL METHODS B-8
3.4 DATA QUALITY OBJECTIVES AND CRITERIA B-9
3.4.1 Precision B-9
3.4.2 Accuracy and Bias B-9
3.4.3 Representativeness B-10
3.4.4 Completeness B-10
3.4.5 Comparability B-11
3.4.6 Sensitivity B-11

3.5 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES B-11
3.5.1 Field Quality Assurance/Quality Control Procedures B-11
3.5.2 Laboratory Sample Handling and Holding Times B-12
3.5.3 Laboratory Quality Assurance/Quality Control B-13
3.6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE B-14
3.6.1 Laboratory Instruments Calibration and Frequency B-14
3.7 DATA MANAGEMENT AND REPORTING B-15
4.0 Assessment and Oversight B-17
4.1 LABORATORY OVERSIGHT AND CORRECTIVE ACTIONS B-17
5.0 Data Validation and Usability B-19
5.1 DATA REVIEW B-19
5.2 VALIDATION METHODS AND RECONCILIATION WITH USER REQUIREMENTS B-19
6.0 References B-21

List of Tables

Table B.1 Quality Assurance Project Plan Analyte List for Sediment
Table B.2 Quality Assurance Project Plan Analyte List for Water
Table B.3 Quality Assurance/Quality Control Criteria
Table B.4 Quality Assurance/Quality Control Frequency
Table B.5 Container and Preservation Criteria for Sediment

List of Abbreviations

Abbreviation	Definition
DQI	Data quality indicator
DRET	Dredging elutriate test
Ecology	Washington State Department of Ecology
EDD	Electronic data deliverable
FSP	Field Sampling Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response

Abbreviation	Definition
IAWP	Interim Action Work Plan
LCS	Laboratory control sample
MDL	Method detection limit
MS	Matrix spike
MSD	Matrix spike duplicate
PAH	Polycyclic aromatic hydrocarbon
%R	Percent recovery
PCB	Polychlorinated biphenyl
Port	Port of Vancouver
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RL	Reporting limit
RPD	Relative percent difference
SDG	Sample delivery group
Site	Terminal 5 Alcoa Vancouver Site
SOP	Standard operating procedure
TOC	Total organic carbon

1.0 Introduction

This Quality Assurance Project Plan (QAPP) is presented as an appendix to the Interim Action Work Plan (IAWP), and it describes the quality assurance (QA) objectives, methods, and procedures to support sediment characterization and presents the field procedures for proposed sampling to characterize sediments necessary to complete remedial design, in accordance with the Washington State Department of Ecology (Ecology) Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (December 2016).

This IAWP was prepared on behalf of the Port of Vancouver (Port) and describes the remedial design selected for a planned cleanup action that the Port is conducting to remedy remaining sediment contamination present within the Terminal 5 sediments. The IAWP also describes the approach for sediment sampling that will be needed to inform remedial design of the Interim Action. The work is being conducted in accordance with an Agreed Order (Order #XXXXXX) between the Port and Ecology.

1.1 DOCUMENT ORGANIZATION

This QAPP provides detailed laboratory methods and protocols for all anticipated types of data collection. QAPP addenda may be prepared if additional data types not detailed in this plan are determined to be needed after completion of part or all of sediment sampling.

This QAPP is organized into the following sections:

- Section 2.0—Project Organization and Responsibilities
- Section 3.0—Data Generation and Acquisition
- Section 4.0—Assessment and Oversight
- Section 5.0—Data Validation and Usability
- Section 6.0—References

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2.0 Project Organization and Responsibilities

2.1 PROJECT MANAGEMENT

The following sections describe the responsibilities of project team members for fulfillment of the QAPP.

2.1.1 Project Manager

Mary Mattix is the Port's Director of Environmental Services and project manager (PM) for this project. Ms. Mattix will oversee all aspects of the planning and implementation of the project.

Jessi Massingale is the Floyd|Snider PM and will have overall responsibility for project implementation. Ms. Massingale will be responsible for the overall QA and quality control (QC) on this project to ensure that it meets technical and contractual requirements. The Floyd|Snider PM will report directly to the Port's PM and is responsible for technical QC and project oversight. She will also support the Port in coordinating with Ecology.

2.1.2 Field QA Officer

Kara Hitchko will be the Floyd|Snider Field Quality Assurance (QA) Officer will be responsible for leading and coordinating the day-to-day activities in the field. The Field QA Officer will report directly to the Floyd|Snider PM and will provide overall direction for the field sampling in terms of logistics, personnel assignments, and field operations. She will supervise collection of the field samples and will be responsible for accurate sample positioning; recording sample locations, depths, and identification; ensuring conformance to sampling and handling requirements, including field decontamination procedures; physical evaluation and logging of the samples; and ensuring chain-of-custody of the samples.

2.1.3 Quality Assurance/Quality Control

The QA and QC coordinator or their designee will serve as the laboratory QA/QC coordinator. The QA/QC coordinator will oversee coordination of the laboratory program, data validation, and project QA coordination, including coordination with the analytical laboratories and the Field QC Officer. The laboratory QA/QC coordinator will be a Floyd|Snider staff member specializing in QA/QC who is independent from the analytical laboratories and field staff responsible for generating the data.

Analytical laboratories will be responsible for chemical analyses and will ensure that submitted samples are handled and analyzed in accordance with the analytical testing procedures and QA/QC requirements, as well as any other requirements specified in this QAPP. The laboratories will provide certified pre-cleaned sample containers and preservatives, as appropriate, and prepare a data report containing analytical and QA/QC results. The laboratory PM will oversee laboratory operations, including receipt of samples, chemical analyses, and laboratory report

preparation. They will prepare and review laboratory reports and case narratives describing any discrepancies that occurred during chemical analyses. They will also notify the laboratory QA/QC coordinator of any problems as soon as they are identified.

2.2 PROBLEM DEFINITION/BACKGROUND

The Field Sampling Plan (FSP) describes the sample collection that will be performed as part of the IAWP in the project area. The IAWP sampling design is intended to provide data gaps information to delineate sediment contamination vertically, horizontally, or both.

2.3 PROJECT TASK DESCRIPTION

Sampling activities described in FSP will be initiated after Ecology and Port approval.

2.4 SPECIAL TRAINING/CERTIFICATIONS

The Field QA Officer and all field personnel will be 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) certified, consistent with OSHA 29 CRF 1910.120, and be trained in the sediment sample collection methods described in the FSP. The Field QA Officer will be responsible for ensuring that field staff and contractors have the necessary training and that field staff are up to date on the annual 8-hour HAZWOPER refresher course.

All analytical laboratories will have current environmental laboratory accreditation from Ecology for the analytical methods to be used.

2.5 DOCUMENTATION AND RECORDS

This QAPP will be approved by the Port PM, the Floyd|Snider PM, and all laboratory contractor PMs. The document will be maintained and updated by the Floyd|Snider PM, who will be responsible for distribution of the approved document and any updated versions to key project contacts and team members. The Port PM may distribute this QAPP to other project stakeholders at their discretion.

Floyd|Snider will store all project records in a secure manner. Each project team member is responsible for filing all project information and records according to internal Floyd|Snider requirements. All electronic data will be maintained in a database in a designated directory at Floyd|Snider.

2.5.1 Laboratory Records

The analytical laboratories will retain all analytical records. Additionally, Floyd|Snider will retain a copy of analytical data in the internal project files. Laboratory data packages will include those items necessary to complete data validation. Elements to be reported in the laboratory data packages are listed in Section 5.1.

All instrument data will be fully restorable at the laboratory from electronic backup. The laboratory will be required to maintain records relevant to project sample analyses for a minimum of 7 years. The PM is responsible for determining and communicating specific requirements for record maintenance if they are different than the default. Data validation reports will be maintained within the Floyd|Snider internal project files with the laboratory data packages.

Each laboratory employs an internal QA manager who is responsible for ensuring that laboratory standard operating procedures (SOPs) are followed and laboratory staff perform routine audits for SOP compliance; routine audits are required for laboratory accreditation. The Floyd|Snider PM or the QA/QC coordinator may request to review records of SOP compliance.

The analytical laboratories will submit data electronically, in the Floyd|Snider standard electronic data deliverable (EDD) format. Guidelines for EDDs will be communicated to the analytical laboratories by the QA/QC coordinator or database manager.

All electronic data submittals must be tab-delimited text files that include all results, method detection limits (MDLs; as applicable), and reporting limits (RLs) consistent with those provided in the laboratory report. If laboratory replicate analyses are conducted on a single submitted field sample, the laboratory sample identifier must distinguish each replicate analysis.

2.5.2 Data Management and Reduction

The Floyd|Snider database manager will oversee data management and reduction in coordination with the PM and task manager or field coordinator. Once all required data are confirmed to be received and validated, the database manager will load all records to Floyd|Snider's electronic database accessed using Microsoft Access software. The database is maintained on the Floyd|Snider server and is backed up with a hard disk. The database manager will manage data exports and will confirm that data are assembled in the required deliverable format with appropriate qualifiers.

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3.0 Data Generation and Acquisition

3.1 DATA COLLECTION OBJECTIVES

Sediment data collected between 2018 and 2022 by Alcoa and the Port, which were presented in the 2024 Final Periodic Review Data Report (Anchor QEA 2024), were evaluated to identify data gaps for remedial design. Based on this assessment, there are multiple areas across Terminal 5 Alcoa Vancouver Site (Site) sediments where the vertical and/or horizontal extent of sediment concentrations exceeding cleanup standards requires further delineation to support cleanup design. The sampling design and approach described in this section were developed to delineate the cleanup area and address data needs for the Interim Action design.

- **Surface Sediment Grab Sampling**—Sediment grab samples will be collected across the Site to 1) delineate the horizontal extent of total polychlorinated biphenyls (PCBs) and total PAHs contamination in surface sediment and 2) increase the spatial density of surface data.
- **Sediment Core Sampling**—Sediment core samples will be collected across the Site to delineate and refine the vertical and horizontal extent of total PCBs and total PAHs contamination in subsurface sediment. Proposed cores have been located to 1) delineate the vertical extent of contamination where existing data do not delineate the depth of contamination exceeding cleanup standards or 2) refine the depth of contamination where existing data include long core intervals that provide insufficient precision for design. Additional proposed cores have been located to delineate the horizontal extent of contamination exceeding cleanup standards in subsurface sediments. Five of the proposed cores are secondary step-outs from contamination observed in the existing dataset and will be archived at the laboratory pending the results of the adjacent proposed primary step-out locations.
- **Dredging Elutriate Test (DRET)**—Bulk sediment and surface water samples will be collected and used for DRETs. The resulting elutriate will be analyzed and used to evaluate water quality best management practices for dredging and design a water treatment system for dredge return water. The DRET is a bench-scale test that simulates the mixing of surface water and sediment that occurs during dredging, then allows solids to settle for a specified duration, after which elutriate can be extracted from the system for evaluation.

3.2 SAMPLING DESIGN AND ANALYTICAL DATA COLLECTION

This section summarizes the collection and analysis of sediment samples presented in detail in the IAWP and Appendix A FSP.

3.2.1 Surface and Subsurface Sediment Data Collection

IAWP sediment data collection involves collecting sediment cores and grabs for vertical or horizontal delineation of areas at the Site to identify data gaps for remedial design.

3.2.2 Bulk Sediment and Treatability Study Data Collection

Sediment cores, sediment grabs, and Site water will be collected for DRET, jar testing for water treatment treatability, and treatability testing for sediment handling.

3.2.3 Sediment Analyses

Surface and subsurface sediment samples will be analyzed for PCBs, polycyclic aromatic hydrocarbons (PAHs), total organic carbon (TOC), total solids, and grain size. Samples requiring PCB analysis will be analyzed as Aroclors. Sediment samples will be analyzed in accordance with Table B.1.

3.2.4 Bulk Sediment and Treatability Study Analyses

DRETs will be prepared and executed following laboratory SOPs and guidance outlined in the U.S. Army Corps of Engineers' Engineer Research and Development Center Technical Guidelines for Environmental Dredging of Contaminated Sediments (USACE 2008). The DRETs and all analytical testing of water (i.e., DRET elutriate, jar test supernatant, site water) will be performed by the laboratory. Jar tests to assess sediment settling and flocculation/coagulation of fine particulates may be performed on-site by field personnel, or alternatively samples may be provided to water treatment technology vendors for jar testing. DRET elutriate, jar test supernatant, and Site water will be analyzed for parameters as summarized in Table B.2, or a subset of these parameters as needed for design. Calibrated field instruments may also be utilized for evaluation of some conventional parameters (e.g., pH, conductivity, turbidity).

Field treatability testing of bulk sediment to assess physical stability and moisture retention for handling and disposal considerations will be performed on-site by field personnel.

3.2.5 Field Quality Control Analyses

Field duplicate samples will be analyzed concurrently for all chemistry constituents (PCBs, PAHs, TOC, and total solids) analyzed in their respective parent samples. Equipment blank samples will be analyzed for PCBs and PAHs only.

3.3 ANALYTICAL METHODS

Laboratory analytical methods were selected to ensure that the samples can be compared to Sediment Management Standards criteria as referenced in the IAWP. Sediment Management Standards criteria, as well as laboratory quantitation limits including practical quantitation limits or RLs and MDLs for the selected analytical methods are presented in Tables B.1 and B.2.

3.4 DATA QUALITY OBJECTIVES AND CRITERIA

Field and laboratory data quality objectives include obtaining data that are technically sound and properly documented, having been evaluated against established criteria for the principal data quality indicators (DQIs; i.e., precision, bias, accuracy, representativeness, completeness, comparability, and sensitivity). Evaluation of the principal DQIs is summarized in the following sections. Data QA/QC criteria (also known as measurement quality objectives) and frequencies are presented in Tables B.2 and B.3, respectively.

3.4.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, precision is a quantitative measure of the variability of a group of measurements compared to their average values. Precision is assessed by performing multiple analyses, such as laboratory duplicate or field duplicate samples, and is defined as the relative percent difference (RPD) between results. Precision will be evaluated for both laboratory and field duplicate samples and calculated as follows.

$$RPD = \frac{(C_1 - C_2) \times 100\%}{\frac{(C_1 + C_2)}{2}}$$

Where:

RPD = relative percent difference
C_1 = larger of the two observed values
C_2 = smaller of the two observed values

Laboratory duplicate sample precision criteria and frequency requirements are presented in Tables B.3 and B.4, respectively. Field duplicate precision will be screened against an RPD of 50% for all samples. For precision calculations (i.e., for calculating RPD) the reporting limit will be used when a non-detect result is included in the evaluation. Additionally, the result/s based on the final dilution will be used in the calculation (i.e., values flagged as estimated greater than a given concentration, which are superseded with subsequent sample dilutions, will not be used).

3.4.2 Accuracy and Bias

Accuracy is an expression of the degree to which a measured or computed value represents the true value. Bias is "the systematic or persistent distortion of a measurement process that causes error in one direction" (EPA 2002a). Analytical bias and accuracy may be assessed by analyzing "spiked" samples with known concentrations, such as laboratory control samples, blank spikes, and standard reference materials. Additionally, matrix spike samples can be analyzed to provide accuracy or bias information in the actual sample matrix. Precision criteria and frequency

requirements are presented in Tables B.3 and B.4, respectively. Accuracy will be evaluated as percent recovery (%R) and will be calculated as follows.

$$\%R = 100\% \times \frac{(S-U)}{C_{sa}}$$

Where:

%R = percent recovery
S = measured concentration in the spiked aliquot
U = measured concentration in the unspiked aliquot
C_{sa} = actual concentration of spike added

For accuracy calculations (i.e., for calculating %R), non-detect results will be assigned a value of zero. Additionally, the results based on the final dilution will be used in the calculation (i.e., values flagged as estimated greater than a given concentration, which are superseded with subsequent sample dilutions, will not be used).

3.4.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent an environmental condition. This data quality objective is addressed by the design of the sampling plan. A list of analytes has been identified to provide a comprehensive assessment of known or potential contaminants. Care has been taken in the design of the sampling program to ensure that sample locations are properly selected, sufficient numbers of samples are collected to accurately reflect conditions at the locations, and samples are representative of the sampling locations as presented in the IAWP. Sufficient volume of samples will be collected at each sampling location to minimize bias or errors associated with sample particle size and heterogeneity.

Representativeness in laboratory data will be assessed by evaluating holding time compliance and the results of the method blanks, equipment blanks, and instrument blanks.

3.4.4 Completeness

Completeness is defined as the number of acceptable data points relative to the total number of data points and is also a measure of the amount of validated data reported versus the expected amount of data (the amount of data collected). Completeness will be assessed for each sample medium. The QA/QC objective for completeness for all components of this project is 90% (Table B.3). Data that were qualified as estimated because the QA/QC criteria were not met will be considered valid for the purpose of assessing completeness. Data that have been qualified as estimated will be further reviewed for usability. Data that were qualified as rejected will not be considered valid for their intended use or for the purpose of assessing completeness. If a sample medium has an unacceptable completeness percentage (less than 90%), original samples will be re-analyzed if sufficient sample volume is available, archived samples will be analyzed if

appropriate, or additional samples will be obtained (if feasible). The equation used to calculate completeness is as follows:

$$\text{Completeness} = \frac{\text{number of valid measurements}}{\text{total number of data points planned}} \times 100$$

3.4.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one dataset can be compared to another. To ensure that results are comparable, samples will be analyzed using USEPA methods, Standard Methods, ASTM methods, and/or other acceptable method protocols. Calibration and reference standards will be traceable to certified standards, and standard data reporting formats will be employed.

3.4.6 Sensitivity

Analytical sensitivity is the minimum concentration of an analyte above which a data user can be reasonably confident that the analyte was reliably detected and quantified. For this investigation, the MDL or estimated detection limit will be used as the measure of sensitivity for each analyte.

3.5 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Guidance for QA/QC is derived from the protocols developed for USEPA's Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods (USEPA 1986), the USEPA National Functional Guidelines (USEPA 2020a, 2020b, and 2020c), and cited methods.

The field coordinator or field personnel will assess and implement field QC procedures as required in this QAPP.

3.5.1 Field Quality Assurance/Quality Control Procedures

3.5.1.1 Sample Identification

Each sample will have a label affixed to the container, and the container will be labeled at the time of collection. The minimum information will be recorded on the label:

- Sample identifier
- Date and time of collection
- Preservative type (if applicable)
- Project name
- Sampler's name or initials

Samples will be identified using the following format as described in the FSP. The laboratory will assign a unique sample identifier to each sample. The laboratory will ensure that a sample

tracking record follows each sample through all stages of laboratory processing. The sample tracking record must contain, at a minimum, the name/initials of individuals responsible for performing the analyses, dates of sample extraction/preparation and analysis, and types of analyses being performed. The analytical laboratories will meet the sample handling requirements and follow the procedures described in the sections below.

3.5.1.2 Field Quality Control Samples

Field QC is evaluated through the analysis of field duplicates and equipment blanks. Field duplicates are used to assess proper homogenization in the field, reproducibility of the sample preparation and analysis, and heterogeneity of the matrix. Equipment blank samples are used to evaluate potential field cross contamination and will be collected after decontamination of sampling equipment. Field QA/QC criteria and frequency are presented in Tables B.3 and B.4.

3.5.1.3 Sample Custody Procedures and Requirements

The Field QA Officer or their designee will be responsible for all sample tracking and custody procedures. They will also be responsible for final sample inventory and will maintain sample custody documentation, such as chain-of custody forms. Copies of all chain-of-custody forms will be retained and included as appendices to the data reports.

The analytical laboratories will ensure that chain-of-custody forms are properly signed upon receipt of the samples and will note any questions or observations concerning sample integrity on the chain-of-custody forms. The analytical laboratories will contact the Field QA Officer and project QA/QC coordinator immediately if discrepancies are discovered between the chain-of-custody forms and the sample shipment upon receipt. Procedures to be followed for sample custody related to shipping are detailed in the FSP.

3.5.1.4 Sample Containers and Preservation Requirements

Sample volumes will be placed in laboratory-provided certified pre-cleaned sample containers and preserved in accordance with the requirements presented in Table B.5. The laboratory will maintain manufacturer documents certifying the cleanliness of containers and/or purity of preservatives provided. The Field QA Officer or a designee will also inspect containers for cleanliness, for signs of damage or tampering, and for presence of preservative if pre-preserved containers will be used. Individual containers with evidence of damage or tampering will be discarded, the laboratory will be notified, and replacement containers will be provided.

3.5.2 Laboratory Sample Handling and Holding Times

Samples will be stored in accordance with the conditions specified in the methods or laboratory SOPs. Samples transferred to other laboratories will be packed in coolers on ice and delivered via courier service or shipped on ice in coolers at temperatures of <6 degrees Celsius, not frozen. The temperature inside each cooler will be checked by the laboratory upon receipt of the

samples. The laboratory will specifically note any coolers that are not sufficiently cold upon receipt.

All samples will be handled to prevent contamination or sample loss. Any remaining sample material will be disposed of upon receipt of written notification by the Floyd|Snider PM. Holding times will vary by analysis and are summarized in Table B.5.

Archive samples will be stored frozen as allowed by the analytical method (refer to Table B.4). Samples will be disposed of after hold times expire, following written authorization from the Floyd|Snider PM. The Floyd|Snider PM may elect to hold archived samples past the specified hold time as needed to gather the additional project data.

3.5.3 Laboratory Quality Assurance/Quality Control

Laboratory results will be evaluated by reviewing analytical results of method blanks, laboratory control samples, certified reference materials, matrix spike (MS)/matrix spike duplicate (MSD) samples, duplicate samples, internal standards, calibrations, and performance evaluation samples, as specified by the analytical methods.

All samples will be diluted and re-analyzed if target compounds are detected at levels that exceed their respective established calibration ranges. Any required cleanups will be conducted prior to the dilutions. Re-analyses will be performed if surrogate, internal standard, or spike recoveries are outside of the QA parameters. QC samples may be re-analyzed if results are not within control limits, and it cannot be determined that the sample matrix is the cause.

3.5.3.1 Sample Delivery Groups

A sample delivery group (SDG) is defined by the laboratory and is generally considered 20 samples, or a group of samples from the same sampling period received at the laboratory on the same day. Although an SDG may span 2 weeks, all holding times specific to each analytical method will be met for each sample in the SDG.

3.5.3.2 Method Blanks

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. A minimum of one method blank will be analyzed for every 20 samples.

3.5.3.3 Laboratory Control Samples

Laboratory control samples (LCSs) are prepared from a clean matrix source using the same process as project samples and are spiked with known amounts of the target compounds. The recoveries of the compounds are used as a measure of the accuracy of the test methods.

3.5.3.4 Matrix Spikes and Matrix Spike Duplicates

The analysis of MS and MSD samples provides information on the extraction efficiency of the method for the sample matrix and is used to evaluate the precision of the method. A minimum of one MS/MSD pair will be analyzed for every 20 samples, when sufficient sample volume is available. A laboratory duplicate sample may be analyzed in place of MSD samples, as allowed by the analytical method.

3.5.3.5 Laboratory Duplicates

Laboratory duplicate samples provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Laboratory duplicates are subsamples of the original sample that are prepared and analyzed as separate samples. A minimum of one laboratory duplicate sample will be analyzed for every 20 samples, when sufficient sample volume is available.

3.5.3.6 Surrogates

All samples, including laboratory QC samples (blanks, LCSs, MS/MSDs, and duplicate samples), analyzed for organic analytes will be spiked with appropriate surrogate compounds. Surrogate recoveries will be reported by the analytical laboratories; however, no sample results will be corrected for recovery using these values.

3.5.3.7 Internal Standards

Internal standards may be used for calibrating and quantifying organic compounds and metals. If internal standards are required by the method, all calibration, QC, and project samples will be spiked with the same concentration of the selected internal standards. Internal standard recoveries and retention times must be within method criteria, laboratory criteria, or both.

3.6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

Inspection and maintenance of laboratory equipment is important to determine the quality of sampling and analysis results.

3.6.1 Laboratory Instruments Calibration and Frequency

Laboratory equipment will be maintained and calibrated according to the manufacturers' recommendations, the laboratory QA plan, SOPs, and standard methodologies. Calibrations will be performed on each analytical instrument prior to analysis. Calibrations are performed at a frequency determined by the analytical method and/or the laboratory SOP. The analysis must stop if the calibration does not meet the specified criteria. The analysis may resume after corrective actions have been taken to meet the method specifications. All project samples analyzed by an instrument found to be out of compliance must be reanalyzed. Laboratories will be responsible for their own preventative maintenance and calibration of laboratory equipment.

3.7 DATA MANAGEMENT AND REPORTING

Analytical chemistry results will be provided by the laboratory in PDF and EDD formats. Data packages will be returned within the time frame specified in the contract between the Port and each laboratory. The data packages will be reviewed to ensure that the correct analyses were performed for each sample submitted and that all analyses requested on the chain-of-custody forms were performed. If discrepancies are noted, the QA/QC coordinator will be notified and will promptly follow up with the laboratory to resolve any issues. After completion of data validation, the digital files will be used to generate the appropriate report tables.

Laboratory data, which are electronically provided and loaded into Floyd|Snider's electronic database, will undergo a check against the laboratory data deliverable. Data will be validated or reviewed manually, and qualifiers, if assigned, will be entered manually. All manually entered data will be verified by a secondary review performed by Floyd|Snider staff. As a final review, after entry into the database, the EDD data will be compared to the field information (e.g., station/location identifiers, sample identifiers, requested analyses) previously entered into the database to confirm that all requested analytical data have been received.

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4.0 Assessment and Oversight

Once data are received from the laboratory, a number of QC procedures will be followed to evaluate data quality and attainment of the data QA/QC objectives and criteria. Specific procedures will be followed to assess the principal DQIs (precision, bias, accuracy, representativeness, completeness, comparability, and sensitivity).

4.1 LABORATORY OVERSIGHT AND CORRECTIVE ACTIONS

Laboratory audits and performance inspections consist of on-site reviews of QA systems and equipment. Laboratory audits will not be conducted as part of this study; however, the laboratory will provide reports from laboratory audits performed as part of general operations to the QA/QC coordinator upon request.

The laboratory is required to comply with its SOPs. The laboratory PM will be responsible for ensuring that appropriate corrective actions are initiated as required for compliance with this QAPP. All laboratory personnel will be responsible for reporting problems that may compromise the quality of the data. If QC results exceed the laboratory control limits, the analyst will identify and correct the anomaly before continuing with the sample analyses, if possible. If the issue cannot be overcome with standard corrective action (e.g., repreparation and reanalysis), the causes of the exceedance and corrective actions will be described in the data package narrative. If the exceedance is gross or widespread, the Floyd|Snider PM and project QA/QC coordinator will be notified immediately, and the appropriate action will be decided.

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5.0 Data Validation and Usability

5.1 DATA REVIEW

Floyd|Snider will review the laboratory reports for internal consistency, transmittal errors, laboratory protocols, and adherence to the objectives specified in this QAPP. A Stage 2A Data Quality Review will be performed as described in this section for all data. The results of the Data Quality Review will be summarized in a pre-design investigation data memorandum as an appendix to the Engineering Design Report.

A Stage 2A Data Quality Review (Summary Validation) includes the following:

- Evaluation of package completeness
- Verification that sample numbers and analyses match those requested on the chain-of-custody form
- Review of method-specified preservation and sample holding times
- Verification that the required detection limits and RLs have been achieved
- Verification that the field and laboratory duplicates, MS/MSDs, and LCSs were analyzed at the proper frequency
- Verification of analytical precision and accuracy via replicate analysis and analyte recoveries
- Verification that the surrogate compound analyses have been performed and meet QC criteria
- Verification that the laboratory method blanks are free of contaminants

5.2 VALIDATION METHODS AND RECONCILIATION WITH USER REQUIREMENTS

Data validation programs have been established in accordance with USEPA guidance (USEPA 2002a). Data validation will be based on the QA/QC criteria as recommended in the methods identified in this QAPP and in USEPA's National Functional Guidelines (USEPA 2020a, 2020b, 2020c) and environmental data verification and validation guidance (USEPA 2002b).

Data usability and any deviations that may have affected the quality of the data, as well as the basis of application of qualifiers, will be included in the final reporting of the data. Any required corrective actions based on the evaluation of the analytical data will be determined by the laboratory PMs, Floyd Snider PM, and data validators in consultation.

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6.0 References

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Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix B

Tables

Table B.1
Quality Assurance Project Plan Analyte List for Sediment

Analyte	Method	Units	SMS Criteria		Laboratory Detection Limits	
			SCO	CSL	MDL	RL
Geotechnical						
Gravel (>2.00 mm)	ASTM D422 Modified	%	--	--	0.01	0.01
Sand (0.063–2.00 mm)			--	--	0.01	0.01
Silt (0.005 < 0.063 mm)			--	--	0.01	0.01
Clay (<0.005 mm)			--	--	0.01	0.01
% Retained 4.75 mm			--	--	0.01	0.01
% Retained 2.00mm			--	--	0.01	0.01
% Retained 0.85 mm			--	--	0.01	0.01
% Retained 0.425 mm			--	--	0.01	0.01
% Retained 0.250 mm			--	--	0.01	0.01
% Retained 0.150 mm			--	--	0.01	0.01
% Retained 0.106 mm			--	--	0.01	0.01
% Retained 0.075 mm			--	--	0.01	0.01
Conventionals						
Total solids	SM 2540 G	%	--	--	1.0	1.0
Total organic carbon	SM 5310B Modified		--	--	0.02	0.02
Polychlorinated Biphenyls						
Aroclor 1016	USEPA 8082A low level	µg/kg	--	--	2.0	4.0
Aroclor 1221			--	--	2.0	4.0
Aroclor 1242			--	--	2.0	4.0
Aroclor 1248			--	--	2.0	4.0
Aroclor 1254			--	--	2.0	4.0
Aroclor 1260			--	--	2.0	4.0
Aroclor 1268			--	--	2.0	4.0
Total PCB Aroclors [1]			110	2,500	--	--
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	USEPA 8270E	µg/kg	--	--	1.33	2.67
Acenaphthylene	USEPA 8270E		--	--	1.33	2.67
Anthracene	USEPA 8270E		--	--	1.33	2.67
Benzo(a)anthracene	USEPA 8270E		--	--	1.33	2.67
Benzo(a)pyrene	USEPA 8270E		--	--	2.0	4.0
Benzo(b)fluoranthene	USEPA 8270E		--	--	2.0	4.0
Benzo(k)fluoranthene	USEPA 8270E		--	--	2.0	4.0
Benzo(g,h,i)perylene	USEPA 8270E		--	--	1.33	2.67
Chrysene	USEPA 8270E		--	--	1.33	2.67
Dibenzo(a,h)anthracene	USEPA 8270E		--	--	1.33	2.67
Fluoranthene	USEPA 8270E		--	--	1.33	2.67
Fluorene	USEPA 8270E		--	--	1.33	2.67
Indeno(1,2,3-cd)pyrene	USEPA 8270E		--	--	1.33	2.67
1-Methylnaphthalene	USEPA 8270E		--	--	2.67	5.33
2-Methylnaphthalene	USEPA 8270E		--	--	2.67	5.33
Naphthalene	USEPA 8270E		--	--	2.67	5.33
Phenanthrene	USEPA 8270E		--	--	1.33	2.67
Pyrene	USEPA 8270E		--	--	1.33	2.67
Total PAHs [2]	USEPA 8270E		17,000	30,000	--	--

Notes:

1 Total Aroclors is the sum of Aroclors 1016, 1221, 1242, 1248, 1254, 1260, and 1268.

2 Total PAHs is the sum of acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene.

Abbreviations:

CSL Cleanup screening level
MDL Method detection limit
µg/kg Micrograms per kilogram
mm Millimeters
PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
RL Reporting limit
SCO Sediment cleanup objective
SMS Sediment Management Standards
TEQ Toxic equivalent
TOC Total organic carbon

Table B.2
Quality Assurance Project Plan Analyte List for Water

Analyte	Method	Units	Laboratory Detection Limits	
			MDL	RL
Conventionals				
Total suspended solids	SM 2540D	mg/L	5	5
Turbidity	SM 2130B	NTU	0.1	0.2
pH	SM 4500-H	--	0.1	0.1
Conductivity	SM 2510B	µmhols/cm	2.5	2.5
Total Organic Carbon	SM 5310C	mg/L	1	1
Alkalinity	SM 2320B	mg $CaCO_3$/L	20	20
Chloride	EPA 300.0	mg/L	0.5	1
Sulfate	EPA 300.0	mg/L	0.5	1
Nitrate	EPA 353.2	mg/L	0.125	0.25
Nitrite	EPA 353.2	mg/L	0.125	0.25
Total Dissolved Solids	SM 2540C	mg/L	5	5
Orthophosphate	SM 4500-P	mg/L	0.01	0.02
Metals				
Calcium	EPA 6020B	mg/L	0.3	0.6
Magnesium	EPA 6020B	mg/L	0.075	0.15
Potassium	EPA 6020B	mg/L	0.05	0.1
Sodium	EPA 6020B	mg/L	0.05	0.1
Hardness	SM 2340B	mg $CaCO_3$/L	2.2	2.2
Polychlorinated Biphenyls				
Aroclor 1016	USEPA 8082A low level	µg/L	0.02	0.04
Aroclor 1221			0.02	0.04
Aroclor 1232			0.02	0.04
Aroclor 1242			0.02	0.04
Aroclor 1248			0.02	0.04
Aroclor 1254			0.02	0.04
Aroclor 1260			0.02	0.04
Total PCB Aroclors (1)			--	--
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	USEPA 8270E	µg/L	0.010	0.020
Acenaphthylene			0.010	0.020
Anthracene			0.010	0.020
Benzo(a)anthracene			0.010	0.020
Benzo(a)pyrene			0.015	0.030
Benzo(b)fluoranthene			0.015	0.030
Benzo(k)fluoranthene			0.015	0.030
Benzo(g,h,i)perylene			0.010	0.020
Chrysene			0.010	0.020
Dibenzo(a,h)anthracene			0.010	0.020
Fluoranthene			0.010	0.020
Fluorene			0.010	0.020
Indeno(1,2,3-cd)pyrene			0.010	0.020
1-Methylnaphthalene			0.020	0.040
2-Methylnaphthalene			0.020	0.040
Naphthalene			0.020	0.040
Phenanthrene			0.010	0.020
Pyrene			0.010	0.020
Total PAHs (2)			--	--

Notes:

1 Total Aroclors is the sum of Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260.

2 Total PAHs is the sum of acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene.

Abbreviations:

DDD	Dichlorodiphenyldichloroethane	mg/L	Milligrams per liter
DDE	Dichlorodiphenyldichlorethylene	NTU	Nephelometric turbidity unit
DDT	Dichlorodiphenyltrichloroethane	PAH	Polycyclic aromatic hydrocarbon
DDx	Calculated as the sum of DDD, DDE, and DDT	PCB	Polychlorinated biphenyl
MDL	Method detection limit	RL	Reporting limit
µg/L	Micrograms per liter	SM	Standard Method
µmhos/cm	Microhos per centimeter	TSS	Total suspended solids
mg $CaCO_3$/L	Milligrams of calcium carbonate per liter		

Table B.3
Quality Assurance/Quality Control Criteria

Parameter	QA/QC Criteria		
	Precision	**Accuracy**	**Completeness**
Solids/Sediments			
Geotechnical analyses	--	--	90%
Total solids	±25%	--	90%
TOC	±25%	70–130%	90%
PCB Aroclors	±35%	50–150%	90%
PAHs	±35%	50–150%	90%
Waters			
Conventionals	±20%	80–120%	90%
Metals	±20%	80–120%	90%
PCB Aroclors	±30%	60–140%	90%
PAHs	±30%	60–140%	90%

Abbreviations:

PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
QA/QC Quality assurance/quality control
TOC Total organic carbon

Table B.4
Quality Assurance/Quality Control Frequency

Parameter	Method Blank [1]	Laboratory Control Samples [1]	Matrix Spike	Matrix Spike Duplicate [2]	Laboratory Duplicate	Surrogate Spike	Field Duplicate	Equipment Blank
Grain size	--	--	--	--	--	--	--	--
Total solids	--	--	--	--	1 per 20 samples	--	--	--
TSS	1 per 20 samples	1 per 20 samples	--	--		--	1 per 20 samples	--
TDS			--	--		--		--
TOC			1 per 20 samples	--		--		--
Alkalinity			--	--		--		--
Anions (chloride, sulfate, nitrate, nitrite)			1 per 20 samples	--		--		--
Metals				--		--		--
Hardness				--		--		--
Orthophosphate				--		--		--
Turbidity	--	--	--	--		--		--
Conductivity	--	--	--	--		--		--
pH	--	--	--	--		--		--
PCB Aroclors	1 per 20 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	--	every sample		1 per event
PAHs					--			

Notes:

1 If less than 20 samples, analyze 1 per analytical batch.

2 Duplicates may be analyzed in place of matrix spike duplicates.

Abbreviations:

PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
TDS Total dissolved solids
TSS Total suspended solids
TOC Total organic carbon

Table B.5
Container and Preservation Criteria for Sediment

Analyte	Method	Sample Handling		
		Container/ Preservative	Holding Time	Sample Preservation Technique
Solids				
Grain size	ASTM D422 modified	16 oz WMG	180 days	Cool <6 °C
Total solids	SM 2450-G	(combined with total organic carbon volume)	28 days	Cool <6 °C
			1 year	Freeze -18 °C
Total organic carbon	SM 5310B modified	4 oz WMG	28 days	Cool <6 °C
			1 year	Freeze -18 °C
PCB Aroclors	USEPA 8082A	8 oz WMG	1 year	Cool <6 °C
				Freeze -18 °C
PAHs	USEPA 8082A	(combine with PCB Aroclors volume)	14 days to extraction; 40 days to analyze	Cool <6 °C
			1 year	Freeze -18 °C
DRET Solids	USACE	3 x 16oz WMG	14 days	Cool <6 °C
Waters				
DRET Site Water	USACE	1 x 5-gallon carboy	7 days	Cool <6 °C
Total Suspended Solids	SM 2540D	1L HDPE	7 days	Cool <6 °C
Total Dissolved Solids	SM 2540C	1L HDPE	7 days	Cool <6 °C
Total organic carbon	SM 5310C	250 mL HDPE	28 days	H2SO4; Cool <6 °C
Alkalinity	SM 2320B	250 mL HDPE	14 days	Cool <6 °C
Turbidity	SM 2130B	250 mL HDPE	48 hours	Cool <6 °C
pH	SM 4500-H		15 minutes	none
Conductivity	SM 2510B		28 days	Cool <6 °C
Chloride	EPA 300.0	250 mL HDPE	28 days	Cool <6 °C
Sulfate	EPA 300.0		28 days	Cool <6 °C
Nitrate	EPA 353.2		48 hours	Cool <6 °C
Nitrite				
Metals	EPA 6020B	250 mL HDPE	6 months	HNO3; Cool <6 °C
Hardness	SM 2340B			
Orthophosphate	SM 4500-P	250 mL HDPE	Filter w/15 minutes; 48 hours for analysis	Cool <6 °C

Abbreviations:

°C Degrees Celsius
DRET Dredging elutriate test
HDPE High-density polyethylene
mL Milliliters
oz Ounces
PAH Polycyclic aromatic hydrocarbon
PCB Polychlorinated biphenyl
USACE U.S. Army Corps of Engineers
WMG Wide-mouth glass jar

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix C
Health and Safety Plan

Table of Contents

1.0 Plan Objectives and Applicability C-1
2.0 Background Information C-3
2.1 SITE BACKGROUND C-3
2.2 SCOPE OF WORK C-3
3.0 Emergency Contacts and Information C-5
3.1 DIAL 911 ..... C-5
3.2 HOSPITAL AND POISON CONTROL C-5
3.3 PROVIDE INFORMATION TO EMERGENCY PERSONNEL C-6
3.4 PROJECT CONTACTS C-6
4.0 Hazard Evaluation and Risk Analysis C-7
4.1 CHEMICAL EXPOSURE HAZARDS C-7
4.2 JOB HAZARD ANALYSIS C-9
5.0 Site Controls and Monitoring C-11
5.1 DAILY SAFETY MEETINGS C-11
5.2 EMERGENCY MUSTER POINT C-11
5.3 PERSONAL PROTECTIVE EQUIPMENT C-11
5.4 DECONTAMINATION AND WASTE DISPOSAL C11
6.0 Approvals C-13
7.0 Signature Page C-15

List of Figures

Figure C.1 Site Vicinity Location **C-3**
Figure C.2 Hospital Directions **C-5**

List of Attachments

Attachment C.1 Accident Prevention Plan
Attachment C.2 Daily Tailgate Safety Meeting Form
Attachment C.3 Near Miss and Incident Reporting Form

List of Abbreviations

Abbreviation	Definition
APP	Accident Prevention Plan
COC	Contaminant of concern
cPAH	Carcinogenic polycyclic aromatic hydrocarbon
ft	Feet
HASP	Health and Safety Plan
HSO/SS	Health and Safety Officer/Site Supervisor
OSHA	Occupational Safety and Health Act
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PID	Photoionization detector
PM	Project Manager
Port	Port of Vancouver
PPE	Personal protective equipment
Site	Port of Vancouver—Dredge
SSO	Site Safety Officer

1.0 Plan Objectives and Applicability

This Health and Safety Plan (HASP) has been written to comply with the standards prescribed by the Occupational Safety and Health Act (OSHA) and the Washington Industrial Safety and Health Act.

The purpose of this HASP is to establish site-specific protection standards and mandatory safe practices and procedures for all personnel involved with sediment sampling at the Port of Vancouver (Port), in Vancouver, Washington. It has been prepared as a supplement to Floyd|Snider's Accident Prevention Plan (APP; Attachment C.1).

This HASP establishes standard operating procedures and provides for contingencies that may be implemented during sediment sampling and processing at the Port. This HASP consists of a description of the Port's property (Site) and facilities, a summary of work activities, the identification and evaluation of chemical and physical hazards, monitoring procedures, a description of Site zones, decontamination and disposal practices, and emergency procedures.

The provisions and procedures outlined in this HASP apply to all Floyd|Snider personnel on-site. Contractors, subcontractors, other oversight personnel, and all other persons involved in the field work activities described herein are required to develop and comply with their own HASP, Health and Safety Plan, or Job Safety Analysis but must also comply with the requirements of this HASP on job sites managed by Floyd|Snider. All Floyd|Snider staff conducting field activities are required to read this HASP and indicate that they understand its contents by signing the Health and Safety Officer/Site Supervisor's (HSO/SS's) copy of this plan prior to conducting field work activities. A copy of this plan must be maintained on site at all times by the HSO/SS.

This HASP is based on information that was available as of the date indicated on the title page. Additional hazards not specifically addressed by this HASP may exist at the work site or may be created as a result of site activities. Should project personnel identify a site condition that is not addressed by this HASP and have any questions or concerns about site conditions, they should immediately notify the HSO/SS, and work shall be paused to assess any new hazards. If any new hazards identified can be mitigated or controlled, work can proceed and the HASP will be revised, if appropriate.

The HSO/SS has field responsibility for ensuring that the HASP adequately protects worker health and safety and is properly implemented. In this capacity, the HSO/SS will conduct regular site inspections and has the authority to make health and safety decisions that may not be specifically outlined in this HASP based on site conditions. If the HSO/SS leaves the Site while work is in progress, an alternate Site Safety Officer (SSO) will be designated. Personnel responsibilities are further described in the APP.

This HASP was reviewed by the Project Manager (PM) and the HSO/SS prior to commencement of work activities.

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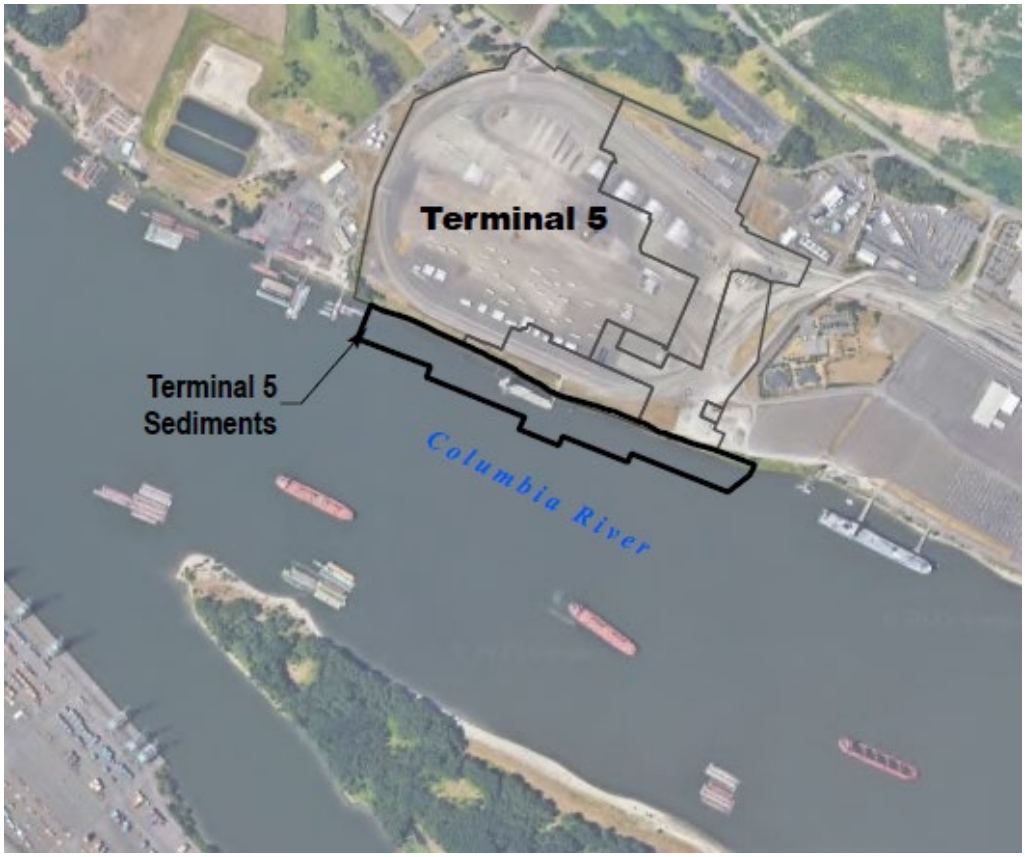
2.0 Background Information

2.1 SITE BACKGROUND

The Terminal 5 property is located along the Columbia River at 5701 NW Old Lower River Road, River Mile 103, approximately 3 miles northwest of Vancouver, Washington. Project activities consist of in-water sediment sampling within the in-water portion of Terminal 5 and sediment sampling processing along an upland Port property (the processing location is to be determined).

Figure C.1
Site Vicinity Location



Contamination is not expected, but contaminants common to industrial in-water property include polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs).

2.2 SCOPE OF WORK

Sediment sampling will be conducted on behalf of the Port to support remedial design of the Port-led Interim Action. Sediment sampling will occur withing the Terminal 5 berth sediments. Sediment sampling cores will be advanced using a vibracore methodology from a vessel. Surface sediment samples will be collected with a Power Grab. Sediment core processing will occur on Port property at a to-be-determined location.

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3.0 Emergency Contacts and Information

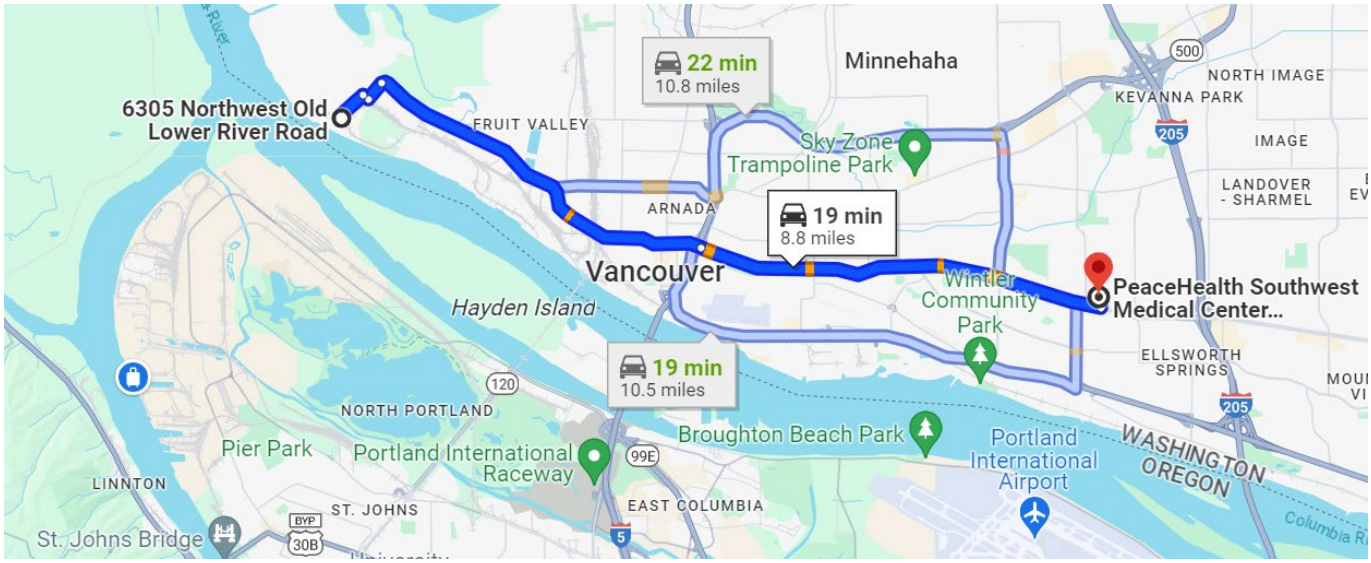
3.1 DIAL 911

In the event of an emergency, dial 911 to reach fire, police, and first aid.

3.2 HOSPITAL AND POISON CONTROL

Nearest Hospital Location and Telephone: (Refer to Figure C.2 for directions and map to the hospital.)	PeaceHealth Southwest Medical Center Emergency Room 400 NE Mother Joseph Place Vancouver, WA 98664 (360) 514-2000
Washington Poison Control Center:	(800) 222-1222

Figure C.2
Hospital Directions



1. Head northeast and turn right onto NW Old Lower River Road
2. Turn left at the 1st cross street to stay on NW Old Lower River Road
3. Turn right onto WA-501 S/NW Lower River Road
4. Continue onto E Mill Plain Blvd
5. Turn left onto NE Mother Joseph Place, continue straight to destination.

3.3 PROVIDE INFORMATION TO EMERGENCY PERSONNEL

All Floyd|Snider project personnel should be prepared to give the following information:

Information to give to Emergency Personnel	
Site Location: (Refer to Figure C.1)	6305 NW Old Lower River Road Vancouver, Washington For in-water emergency: communicate nearest berth number and coordinate with Emergency Medical Services for nearest access location.
Number You Are Calling From:	This information can be found on the phone you are calling from.
Type of Accident or Type(s) of Injuries:	Describe accident and/or incident and number of individuals needing assistance.

3.4 PROJECT CONTACTS

After contacting emergency response crews as necessary, contact the Floyd|Snider PM, or a Principal, to report the emergency. The Floyd|Snider PM may then contact the Port or direct the field staff to do so.

Floyd|Snider Emergency Contacts

Contact	Office Phone Number	Cell Phone Number
Jessi Massingale, Principal	(206) 292-2078	206-683-4307
Erin Murray		206-715-1422
Kara Hitchko HSO/SS		206-795-0523

Port Emergency Contacts

Contact	Office Phone Number	Cell Phone Number
Matt Harding	360-992-1138	360-518-3004

4.0 Hazard Evaluation and Risk Analysis

The typical fire, explosion, and physical hazards likely to be present on the job site, and procedures to control the mitigation of these hazards, are presented in the APP. This HASP presents additional information regarding site-specific hazards, including chemical exposure hazards associated with site COCs or the scope of field activities and analysis of the hazards associated with each site investigation task.

4.1 CHEMICAL EXPOSURE HAZARDS

This section describes potential chemical hazards associated with the field activities being conducted. Based on previous site data, elevated concentrations of the following chemicals may be encountered at the Site:

- cPAHs
- PCB

Human health hazards associated with these chemicals are presented in the following table. This information covers potential toxic effects that might occur in the event of relatively significant acute and/or chronic exposure. Potential routes of exposure include contact with contaminated soil.

Chemical exposure is considered unlikely and highly preventable. In general, the chemicals that may be encountered at this Site are not expected to be present at concentrations that could result in significant exposures. The types of planned work activities and use of monitoring procedures and protective measures will limit potential exposures at this Site. The use of appropriate personal protective equipment (PPE) and decontamination practices will assist in controlling exposure by means of all pathways to the COCs listed in the following table.

Chemical Hazard	OSHA PEL (8-hour TWA/STEL)	Routes of Exposure	Potential Toxic Effects	Maximum Historical Concentration in Sediment
cPAHs (as carbon black or coal tar pitch volatiles)	0.1 mg/m3 ACGIH STEL 0.2 mg/m3	Inhalation of dust; skin and/or eye contact	Cough/bronchitis; irritation to eyes; dermatitis; potential occupational carcinogen	Surface: Total cPAH: 4,800 µg/kg Total PAH: 62,940 µg/kg
PCBs (as Aroclor 1254)	0.5 mg/m3 (skin) NIOSH REL 0.001 mg/m3 TWA	Inhalation of dust; skin absorption; ingestion; skin and/or eye contact	Irritation to eyes; chloracne; liver damage; reproductive effects; potential occupational carcinogen	Surface: Total PCBs: 4,610 µg/kg Subsurface: Total PCBs: 4,800 µg/kg

Abbreviations:

ACGIH	American Conference of Governmental Industrial Hygienists
µg/kg	Micrograms per kilogram
mg/m^3	Milligrams per cubic meter
NIOSH	National Institute for Occupational Safety and Health
PEL	Permissible Exposure limit
REL	Recommended Exposure limit
STEL	Short-term exposure limit
TWA	Time-weighted average

4.2 JOB HAZARD ANALYSIS

This section identifies potential hazards associated with each task listed in Section 2.2 of this HASP. Tasks have been grouped according to the types of potential hazards associated with them.

Work Task	Potential Hazards	Actions to Control Hazards
Load and Transport Equipment on Vehicles	Damage or injury from unsecured cargo	Ensure that all cargo is secured when packing equipment in or out. Prevent movement of equipment while vehicle is in operation.
	Injuries during the removal of work zone delineators	Verify that traffic is clear before removing work zone delineators and/or traffic control devices.
	Musculoskeletal injuries (strain, sprain, broken bones, etc.) from lifting/moving tools and equipment or slips, trips, and falls	Use proper lifting techniques: lift from the knees and team lift heavy objects. Use mechanical devices where appropriate. Keep the ground surface free of trip and fall hazards.
	Heat and cold stress, inclement weather	Implement procedures for monitoring, modified work practices (if needed), and weather safety as described in the APP (refer to Attachment C.1).
Load and Transport Equipment on Vessels	Damage or injury from unsecured cargo, musculoskeletal injuries, heat and cold stress, inclement weather	Use safety precautions as described above.
	Drowning	Wear a personal floatation device at all times when working in or near water. Enter vessel at designated loading area and keep loading area free of trip and fall hazards. Carry objects so that the ground is visible in front of your feet at all times; team lift as necessary.
	Crushing injuries	Avoid pinch points between vessel and dock. Do not tie or untie lines unless specifically directed by vessel crew.

Work Task	Potential Hazards	Actions to Control Hazards
Vibracore sample collection	Overhead hazards from falling objects	Wear proper PPE including hard hat. Stand clear of core tube when hoisting and retrieving. Team lift long core sections; cut long core tubes into smaller sections. Secure core tubes for transport.
	Lacerations from core tubes	Wear appropriate work gloves. Protect sharp surfaces.
	Musculoskeletal injuries, drowning, crushing injuries, heat and cold stress, inclement weather	Use safety precautions as described above.
Grab (Power Grab) Sample Collection	Overhead hazards from falling objects	Wear proper PPE including hard hat. Stand clear of grab when hoisting and retrieving.
	Crushing injuries from pneumatically/hydraulically actuated grab	Disengage closing device prior to visually assessing or touching sample. Wait for vessel crew to verify that closing device is disengaged.
	Musculoskeletal injuries, drowning, heat and cold stress, inclement weather	Use safety precautions as described above.
Core Opening and Processing	Electrical hazards from power saw	Use a power source with a ground fault circuit. Keep work area dry. Unplug tools when not in use.
	Noise or cuts from power saw	Wear appropriate hearing protection and cut-resistant gloves (refer to Section 5.3).
	Lacerations from core tubes, musculoskeletal injuries, heat and cold stress, inclement weather	Use safety precautions as described above
	Chemical hazards	Wear appropriate PPE for the task (refer to Section 5.3) and follow appropriate decontamination procedures (refer to Section 5.4).

5.0 Site Controls and Monitoring

The following sections describe site controls and monitoring that will be implemented during site field activities. The HSO/SS, or a designated alternate (SSO), is responsible for inspecting the work area daily and identifying additional hazards. Personnel responsibilities are further described in the APP.

5.1 DAILY SAFETY MEETINGS

A safety meeting will be conducted by the HSO/SS or designated SSO daily prior to the start of work. Additional safety briefings or safety checks should also be performed when switching tasks or whenever new hazards are identified. Safety meetings topics and attendance will be recorded on the Daily Tailgate Safety Meeting and Debrief Form provided in Attachment C.2.

Any near-misses or incidents that occur on the job site will be recorded on the Near Miss and Incident Reporting Form provided in Attachment C.3.

5.2 EMERGENCY MUSTER POINT

In the event of an emergency, staff on land are to gather at the meeting point that will be determined prior to the field event. Staff performing work on the water are to muster at the nearest safe location, which may include remaining on the vessel or a nearby land location.

The APP describes required emergency equipment and procedures to be followed in the case of medical emergency; release of a hazardous substance; or other emergencies such as a thunderstorm, vehicle collision, fire, or earthquake.

5.3 PERSONAL PROTECTIVE EQUIPMENT

Work will proceed in standard Level D as described in the APP. PPE should be inspected for defects before each use. Field staff will use clean, disposable nitrile gloves when handling sample material. Hard hats are required when overhead hazards are present, and cut-resistant work gloves should be used for manual cutting tasks.

5.4 DECONTAMINATION AND WASTE DISPOSAL

Field staff should always follow the best practices for prevention of contamination detailed in the APP.

Sampling equipment will be decontaminated in accordance with the Sampling and Analysis Plan and Quality Assurance Project Plan and will include Liquinox detergent wash and successive deionized water rinses between all sampling locations. Personnel decontamination will include removal of disposable gloves and washing of hands prior to eating or drinking.

Floyd|Snider and its subcontractors will use safe and prudent waste collection and housekeeping practices to minimize the spread of contamination beyond the work zone and the amount of investigation-derived waste (IDW). The Floyd|Snider HSO/SS will work with site personnel to ensure the proper collection, packaging, and identification of waste materials so that waste materials will be properly disposed of.

6.0 Approvals

Project Manager	Date
Project Health & Safety Officer	Date

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7.0 Signature Page

I have read this Health and Safety Plan and understand its contents. I agree to abide by its provisions and will immediately notify the HSO/SS if site conditions or hazards not specifically designated herein are encountered.

Name (Print)	Signature	Date	Company/Affiliation

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix C

Attachment C.1
Accident Prevention Plan

Accident Prevention Plan

June 2022

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Table of Contents

1.0 Plan Objectives and Applicability 1-1

2.0 Roles and Responsibilities 2-1

2.1 BOARD OF DIRECTORS 2-1

2.2 HEALTH AND SAFETY COMMITTEE 2-1

2.3 HEALTH AND SAFETY ADMINISTRATOR 2-1

2.4 PROJECT MANAGERS 2-1

2.5 FIELD HEALTH AND SAFETY OFFICER AND SITE SUPERVISOR 2-2

2.6 FIELD SITE SAFETY OFFICER 2-2

2.7 FLOOR WARDENS 2-2

2.8 EQUIPMENT MANAGER 2-3

2.9 FLOYD|SNIDER PERSONNEL 2-3

2.10 EMERGENCY CONTACTS 2-3

3.0 Safety Policies 3-1

3.1 GENERAL OFFICE SAFETY 3-1

3.1.1 Injury Prevention 3-1

3.1.2 Administration of First Aid and Cardiopulmonary Resuscitation 3-1

3.1.3 New Employee Orientation 3-2

3.1.4 Workplace Hostility 3-2

3.2 FIELD SAFETY 3-2

3.2.1 Stop Work Authority 3-2

3.2.2 Health and Safety Plan 3-3

3.2.3 Tailgate Safety Meetings 3-3

3.2.4 Buddy System 3-3

3.2.5 Check-in Procedure 3-3

3.2.6 Personal Protective Equipment 3-4

3.2.7 Confined Spaces 3-5

3.3 RESPIRATORY PROTECTION PROGRAM 3-5

3.3.1 Applicability 3-5

3.3.2 Administrator and Employee Responsibility 3-6

3.3.3 Use of Respirators 3-6

3.3.4 Wildfire Smoke Exposure Control Plan 3-7

3.3.5 Selection of Respirators 3-11
3.3.6 Medical Evaluations 3-11
3.3.7 Respirator Fit and Seal Check 3-12
3.3.8 Respirator Replacement, Maintenance, and Storage 3-12
3.3.9 Training 3-13
3.3.10 Record Keeping 3-13
3.4 BUILDING SECURITY 3-13
3.5 VEHICLE SAFETY 3-14
3.5.1 General Vehicle Safety 3-14
3.5.2 Floyd|Snider Vehicle Safety 3-15
3.6 CONTROLLED SUBSTANCE ABUSE 3-16
4.0 Emergency Procedures 4-1
4.1 MEDICAL EMERGENCIES 4-1
4.2 ACCIDENTAL RELEASE OF HAZARDOUS MATERIALS OR WASTES 4-2
4.3 OTHER EMERGENCIES AND NATURAL DISASTERS 4-2
4.4 EMERGENCY COMMUNICATIONS 4-4
4.5 EMERGENCY EQUIPMENT 4-4
4.6 INCLEMENT WEATHER 4-5
4.7 CATASTROPHIC EVENTS 4-5
5.0 Hazard Awareness and Mitigation 5-1
5.1 CHEMICAL EXPOSURE HAZARDS 5-1
5.2 FIRE AND EXPLOSION HAZARDS 5-1
5.3 PHYSICAL HAZARDS 5-1
5.3.1 Cold Stress 5-5
5.3.2 Heat Stress 5-7
5.3.3 Allergies and Biohazards 5-9
5.3.4 Fatigue 5-9
6.0 Job Site Controls 6-1
7.0 Training Requirements 7-1
7.1 MEDICAL MONITORING 7-1
7.2 HAZWOPER TRAINING 7-1
7.3 JOB-SPECIFIC TRAINING 7-2
7.4 CPR/FIRST AID 7-2

7.5 EXITING THE FIELD STAFF SAFETY TRAINING AND MEDICAL MONITORING PROGRAM 7-2
7.5.1 Termination of Employment 7-2
7.5.2 Transition of Role 7-3
8.0 Record Keeping and Reporting 8-1
8.1 RECORD KEEPING 8-1
8.2 REPORTING 8-1
9.0 Signature Page 9-1

List of Tables

Table 3.1 Action Levels for Wildfire Smoke 3-10

List of Abbreviations

Acronym/ Abbreviation	Definition
AED	Automated external defibrillator
APP	Accident Prevention Plan
AQI	Air quality index
COPD	Chronic obstructive pulmonary disease
CPR	Cardiopulmonary resuscitation
°F	Degrees Fahrenheit
FFR	Filtering facepiece respirator
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSO/SS	Health and Safety Officer/Site Supervisor
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
L&I	Washington State Department of Labor & Industries
MTCA	Model Toxics Control Act
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Act
PEL	Permissible exposure limit
PM	Project Manager

Acronym/ Abbreviation	Definition
PPE	Personal protective equipment
RPP	Respiratory Protection Program
SDS	Safety Data Sheet
SSO	Site Safety Officer
USEPA	U.S. Environmental Protection Agency
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act

1.0 Plan Objectives and Applicability

This Accident Prevention Plan (APP) describes the policies and best practices established by Floyd|Snider to ensure the safety of employees to the maximum extent possible when performing their work duties. Employee safety is Floyd|Snider's highest priority. Employees are encouraged to use the Health and Safety Department as a resource in identifying potential hazards and the appropriate precautions to address them. While additional safety precautions may impact project schedules and costs, Floyd|Snider will ultimately benefit as accidents are avoided.

This APP has been written to comply with the standards of the Occupational Safety and Health Act (OSHA) and Washington Industrial Safety and Health Act (WISHA) as they pertain to work activities performed by Floyd|Snider.

This APP applies to all employees of Floyd|Snider. It consists of the following components:

- A description of the roles and responsibilities of all Floyd|Snider personnel in ensuring worker safety,
- General safety policies for the office and the field job site,
- Procedures to follow in an emergency,
- Information on common hazards and steps that should be taken to mitigate these hazards,
- A description of the basic safety controls that should be implemented on all field job sites,
- Training requirements for field staff, and
- Safety record keeping and reporting requirements and procedures.

2.0 Roles and Responsibilities

All staff members share responsibility for safety. The roles and responsibilities for Floyd|Snider staff in ensuring company safety are described in the following sections.

2.1 BOARD OF DIRECTORS

The Floyd|Snider board of directors consists of the elected senior officers of Floyd|Snider who establish the company's culture of safety. These individuals set policy for the company, including safety policy. The Management Committee, which consists of the Board of Directors and additional shareholder representatives, is also responsible for enforcement of this APP.

2.2 HEALTH AND SAFETY COMMITTEE

The Health and Safety Committee is composed of field and management staff, who meet on a quarterly basis or more frequently if needed to review and update the Floyd|Snider Health and Safety Program. The Health and Safety Committee is responsible for making updates to this APP as approved by the Management Committee. Health and Safety Committee meeting minutes are recorded and made accessible on Floyd|Snider's Health and Safety department page on SharePoint.

2.3 HEALTH AND SAFETY ADMINISTRATOR

The Health and Safety Administrator receives, organizes, and reviews reports of near misses and incidents in the workplace. The Health and Safety Administrator is responsible for the administration of benefits, working with managers to identify OSHA-reportable incidents, and managing the OSHA reporting process. The Health and Safety Administrator is also responsible for documentation of Health and Safety Committee meeting minutes and employee training record keeping. The Health and Safety Administrator is supported by the Board of Directors and the Health and Safety Committee, who are responsible for taking corrective actions when near misses, incidents, and other safety issues identified in this plan occur.

2.4 PROJECT MANAGERS

Project Managers (PMs) reinforce the Floyd|Snider safety culture. During all phases of projects, PMs review health and safety issues and will have authority to allocate resources and personnel to safely accomplish project work.

PMs direct the field personnel at a job site. PMs coordinate with the project Health and Safety Officer/Site Supervisor (HSO/SS) to ensure that the scope of the project and site conditions are accurately documented in all project safety materials and that all Floyd|Snider personnel on site have received the required safety training and understand the procedures to follow should an incident occur on site. PMs review safety documentation materials with the HSO/SS at intervals

determined prior to the start of field events and report near misses and incidents to the Health and Safety Administrator.

2.5 FIELD HEALTH AND SAFETY OFFICER AND SITE SUPERVISOR

The HSO/SS prepares and/or approves the site Health and Safety Plan (HASP) and any amendments thereof and is responsible for full implementation of all elements of the HASP.

The HSO/SS will advise the PM and project personnel on all potential health and safety issues of the field investigation activities to be conducted at a site. The HSO/SS will specify required exposure monitoring to assess site health and safety conditions, modify the site HASP based on field assessment of health and safety accidents and/or incidents, and recommend corrective action if needed. The HSO/SS will report all accidents and/or incidents to the PM. If the HSO/SS observes unsafe working conditions by Floyd|Snider personnel or any contractor personnel, the HSO/SS will suspend all work until the hazard has been addressed.

The HSO/SS is responsible for conducting tailgate safety meetings daily before the start of field work. Tailgate safety meetings should identify the work to be completed, safety hazards likely to be encountered, and the appropriate work practices needed to minimize exposure to these hazards. Tailgate safety meeting forms are included in the HASP documents.

2.6 FIELD SITE SAFETY OFFICER

The field Site Safety Officer (SSO) may be a person dedicated to this task, to assist the HSO/SS during field work activities. The SSO will ensure that all personnel have appropriate personal protective equipment (PPE) on site and that PPE is properly used. The SSO will assist the HSO/SS in field observation of Floyd|Snider personnel safety. If a health or safety hazard is observed, the SSO shall suspend all work activity. The SSO will conduct onsite safety meetings daily before work commences. All health and safety equipment will be calibrated daily and records kept in the daily field logbook. The SSO may perform exposure monitoring if needed and will ensure that equipment is properly maintained.

2.7 FLOOR WARDENS

Floor Wardens are Floyd|Snider staff members who have volunteered to coordinate Floyd|Snider's response in case of an emergency at Union Square. Floor Wardens are responsible for ensuring that all staff have evacuated the building if an evacuation order is issued by building management and accounting for staff at the emergency muster point. Floor Wardens also post and update emergency evacuation routes and maintain maintenance records for fire extinguishers located at the office. The names of current Floor Wardens are posted in the office above fire extinguishers and on the Floyd|Snider SharePoint home page.

2.8 EQUIPMENT MANAGER

The Equipment Manager is responsible for ensuring that all field equipment, including the company vehicle, is in safe working order and for keeping records of equipment maintenance. Employees must report any issues with the company vehicle or field equipment to the Equipment Manager. The Equipment Manager will designate an alternate for days when the manager will not be available to assist field staff with urgent equipment or vehicle issues.

2.9 FLOYD|SNIDER PERSONNEL

All Floyd|Snider project personnel will take precautions to prevent accidents and/or incidents from occurring to themselves and others. Employees must read, understand, and sign this APP. Employees will report all incidents and near misses to their PM, HSO/SS, or SSO and inform of any physical conditions that could impact their ability to perform their work.

2.10 EMERGENCY CONTACTS

All Floyd|Snider staff must designate a person outside of the company who may be contacted in case of an emergency in which a staff member requires medical care. Emergency contacts are responsible for making decisions regarding medical treatment in the event that the staff member is incapacitated, or for contacting the individual who has been designated authority by the staff person to make such decisions if they do not have that authority.

Emergency contact information will be provided to the Health and Safety Administrator and updated as needed, at a minimum frequency of once per year. The Health and Safety Administrator is responsible for maintaining emergency contact information in the Floyd|Snider firm contact database and making this information available on the Floyd|Snider SharePoint home page.

3.0 Safety Policies

The safety policies presented in this section have been developed to ensure the safety of all staff. They should be considered the minimum requirements to maintain a safe workplace; staff should be vigilant at all times and take the needed actions to identify and correct unsafe situations.

3.1 GENERAL OFFICE SAFETY

This section describes the policies that have been developed to keep staff safe in all work scenarios, including at the office and on the job site.

3.1.1 Injury Prevention

In office areas, trips and falls are the primary cause of acute injury, and they can be easily prevented. There are many different ways to prevent injury, including, but not limited to:

- Keep all work areas, aisles, and hallways clear at all times.
- Make sure all exits are accessible, clearly marked, and properly illuminated.
- Keep all work and storage areas in a sanitary condition; floors shall be clean and, as much as possible, kept in a dry condition. If floors are wet, they should be marked with signage to notify others.
- Pile or store materials in a stable manner, so that they will not be subject to falling.
- Keep walkways and work areas free of electrical cords.
- Never make repairs to light fixtures unless authorized to do so by a supervisor.
- Use a stepstool when reaching overhead objects.
- Do not lift equipment and materials weighing more than 20 pounds by yourself; ask for help and/or use a handtruck.
- When carrying loads, exercise care to avoid overexertion and strain. Use proper lifting and reaching techniques.
- Use adjustable desk chairs to reduce musculoskeletal injuries; ask for assistance if you are unfamiliar with proper ergonomic adjusts for your desk, computer, and chair.
- Report all unsafe conditions and symptoms of injury to the Health and Safety Administrator.
- Exercise caution in moving about the office.

3.1.2 Administration of First Aid and Cardiopulmonary Resuscitation

First aid and cardiopulmonary resuscitation (CPR) should only be administered by individuals with the appropriate training. Floyd|Snider makes First Aid and CPR/automated external defibrillator (AED) training to available to all staff members and requires this training for all field staff members. At least one person on a field site must be trained and have current certification in

First Aid and CPR. First aid kits compliant with the ANSI Z308.1-2015 Class B standard will be available at the Floyd|Snider office and at all field sites. First aid kits for field sites additionally include basic medications (aspirin and diphenhydramine), tweezers, a clotting sponge, potable water, outdoor skin cleanser, super glue, adhesive moleskin pads, safety pins, sunblock, insect repellant, medical masks and a printed field staff emergency contact list.

3.1.3 New Employee Orientation

All new employees receive an orientation to the Floyd|Snider Health and Safety Program from a member of the Health and Safety Committee. This orientation is arranged by the assigned mentor for the new employee and includes a review of the materials available on the Health and Safety department home page (APP, HASP templates, near miss and incident forms, training resources, etc.) as appropriate to the employee's role at Floyd|Snider, office and field safety policies, and training and documentation requirements for field and office safety.

3.1.4 Workplace Hostility

Floyd|Snider intends to provide a work environment that is free from intimidation, hostility, or other offenses that are inappropriate. Harassment of any sort—verbal, physical, or visual—will not be tolerated.

Harassment can take many forms. It may be, but is not limited to, words, signs, jokes, pranks, physical or verbal intimidation, physical contact, or violence. Harassment is not necessarily sexual in nature, although these prohibitions against harassment specifically include all forms of sexual harassment.

It is the company's policy to regard sexual harassment and other forms of harassment, as well as the threat of such harassment, as very serious matters and to prohibit them in the workplace by any person and in any form. All staff are required to complete harassment training. Floyd|Snider also makes bystander intervention training available to all staff.

3.2 FIELD SAFETY

This section describes the additional policies developed to keep field staff safe on the job site.

3.2.1 Stop Work Authority

All staff members have Stop Work Authority. Stop Work could be a temporary pause in work for a few minutes or a full shutdown of work until unsafe work conditions can be addressed. If unsafe work conditions are encountered and cannot be immediately addressed by the staff on-site, the HSO/SS should report immediately to the PM. Safety hazards may include physical site conditions or dangerous work practices by subcontractors or other workers. The PM will help the field staff to make modifications to the work practices to mitigate the hazard if possible. If the unsafe conditions cannot be mitigated, field staff have the authority to stop all work until the conditions can be properly addressed.

3.2.2 Health and Safety Plan

A site-specific HASP must be prepared and made available to field staff at job sites. A site-specific HASP is required for any activities where field staff may contact contaminated material; activities such as a site visit or oversight where no contact with contaminated material or physical hazards may occur can be completed without a HASP, if approved by the PM. The HASP should address both potential physical and chemical hazards on-site and steps taken to mitigate those hazards.

3.2.3 Tailgate Safety Meetings

The HSO/SS is responsible for conducting tailgate safety meetings daily before the start of field work. Tailgate safety meetings should identify the work to be completed, safety hazards likely to be encountered, and the appropriate work practices needed to minimize exposure to these hazards. Tailgate safety meetings must always cover the site-specific procedures to follow in case of an emergency.

When performing field work, staff should maintain awareness of new or changing hazards at the job site. Staff should always assess then reassess the hazards when changing between tasks or changing the manner in which a task is performed and document meetings and assessments on the tailgate safety meeting form.

3.2.4 Buddy System

Floyd|Snider employs the buddy system for work at job sites meaning employees are never alone in the field. The buddy system ensures that employees can get help in case of an emergency. Working in the field without another Floyd|Snider employee present may be permissible in the following scenarios:

- When the site is occupied, you are not performing an activity with high risk of injury (e.g., not working in traffic, not entering small spaces or lifting heavy objects), and you are in close proximity of other people capable of responding if you call for help.
- If you are accompanied by a teaming partner or subconsultant who may act as your buddy.
- IF FOR ANY REASON YOU ARE NOT COMFORTABLE WITH THE ASSIGNMENT OR THE CONDITIONS, DISCUSS IT WITH YOUR PM AND ASK FOR A BUDDY.

3.2.5 Check-in Procedure

All employees in the field, whether in groups or alone, will follow the check-in procedure detailed below:

- Notify front desk or your PM when you are leaving for field work. Notification can be by email, phone, or in person.
- Provide an estimated completion time of when you think you will return to the office or head home.

- At the end of the field day, before leaving the site, call the office and let the front desk or your PM (the same person you notified at the beginning of the day) know you are returning to the office or heading home. Ask to be transferred to the PM to discuss how things went.
- If you will not be finished with field work by 5:00 p.m., call the office and let the front desk know you are still in the field and that you will check in with the PM when fieldwork is finished.
- Communicate with the PM when you are finished with work and leaving the site (after 5:00 p.m.).
- If you are in a group of Floyd|Snider employees doing this field work, one person can do this check-in process on behalf of the group.
- If you fail to check in and cannot be reached by cell phone, someone from the office may be sent to locate you, or local authorities may be notified.

3.2.6 Personal Protective Equipment

Field staff must wear the appropriate PPE required in the site-specific HASP. Floyd|Snider provides employees with all required PPE such as steel-toed boots, reflective vest/jacket, hardhat, safety glasses, gloves, ear protection, and first aid kits. Field staff are responsible for wearing the appropriate PPE in accordance with the HASP, keeping their PPE in good condition, and replacing it as needed.

All work will proceed in Level D PPE, which shall include hard hat, protective footwear, hearing protection, eye protection, gloves, and sturdy outer work clothing. Protective footwear must be compliant with ASTM F2413 or the former ANSI Z41 (repealed) standard, with oil- and chemical-resistant soles, and must be securely laced without signs of excessive tread wear. For all work involving potential exposure to soil and groundwater, workers will wear nitrile gloves and Level D PPE. Personal floatation devices will be worn at all times during work in the vicinity of surface water. When working in a remote location, all teams must carry a field first aid kit. The contents of a field first aid kit include basic medications (aspirin and diphenhydramine), sterile dressings, adhesive bandages and tape, wound-cleansing towelettes, sting-relief wipes, antibiotic ointment, butterfly bandages, tweezers, safety pins, and a printed field staff emergency contact list.

All field personnel will be properly fitted for PPE and trained in the use of PPE during initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training (refer to Section 7.0 for additional training information). The level of protection will be upgraded by the HSO/SS whenever warranted by conditions present in the work area. The HSO/SS will ensure that field staff know how to properly use PPE and periodically inspect equipment such as gloves and hard hats for defects.

3.2.7 Confined Spaces

Floyd|Snider field staff are not trained in confined space entry and may not enter permit-required confined spaces. It is considered entry if your head/face breaks the plane of the confined space opening.

Confined spaces are defined as a spaces that have limited or restricted means for entry or exit and are not designed for continuous occupancy. Confined spaces commonly encountered at field sites may include vaults, manholes, pits, and tanks. OSHA designates confined spaces as "permit-required confined spaces" if they exhibit one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere
- Contains material that has the potential to engulf an entrant
- Has walls that converge inward or floors that slope downward and taper into a smaller area that could trap or asphyxiate an entrant
- Contains any other recognized safety or health hazard (e.g., unguarded machinery, exposed wires, extreme heat)

In accordance with OSHA regulations, only personnel with specialized confined space training may enter a permit-required confined space under a confined space entry plan.

3.3 RESPIRATORY PROTECTION PROGRAM

The goals of the Respiratory Protection Program (RPP) are to protect employees from potential exposure to respiratory hazards and to ensure compliance with applicable occupational safety and health standards regarding respiratory hazards. Additionally, the RPP provides requirements for the proper selection and use of respiratory protection equipment.

On July 16, 2021, the Washington State Department of Labor & Industries (L&I) adopted an emergency rule to protect workers who are exposed to harmful levels of wildfire smoke (WAC 296-62-085). This RPP conforms to the Washington Administrative Code (WAC) standards for WAC 296-841 Airborne Contaminants and WAC 296-842 Respirators, as well as draft rule WAC 296-65-085 Wildfire Smoke.

3.3.1 Applicability

This RPP applies to respiratory protection used in the field due to impaired ambient air quality when respirator use is not required but may be preferred for comfort. This applies to impaired ambient air quality due to chemical hazards or wildfire smoke. Employees will not be required to perform site work when airborne substances (i.e., site contaminants) are present at concentrations exceeding their OSHA permissible exposure limits (PELs) or if air quality due to wildfire smoke exceeds the Stop Work action threshold and respiratory protection would be

required to safely complete the work. Employees may additionally elect to use respirators for comfort purposes to control non-hazardous substances such as nuisance odors.

If there is the potential to exceed a PEL or wildfire smoke action threshold at a site, engineering and administrative controls will be implemented to mitigate the hazard. Project work that cannot be altered by using engineering or administrative controls must be approved by the Management Committee in advance of the scheduled fieldwork.

The RPP is intended to help employees identify conditions that may warrant the voluntary use of a respirator and to support the selection and maintenance (if applicable) of an appropriate respirator. The RPP should be implemented when employees are working in conditions where respiratory hazards may be encountered, such as when working in conditions with wildfire smoke.

3.3.2 Administrator and Employee Responsibility

The RPP administrator is the Health and Safety Committee chair. The RPP administrator oversees the development, execution, and evaluation of the RPP and will ensure procedures are followed, respirator use is monitored, and respirators provide adequate protection when job conditions change. The RPP administrator will ensure appropriate respirators and the associated supplies are provided to employees for voluntary use at no cost to the employee.

Employees voluntarily using respirators have the following responsibilities:

1. Participate in the Floyd|Snider medical monitoring program in accordance with Section 7.1.
2. Use the respirator only for the specific tasks that it was issued for.
3. Seek medical help if wearing a respirator creates negative health effects such as difficulty breathing, dizziness, or anxiety.
4. Care for and maintain respirators as instructed, including following the manufacturer's specific cartridge change-out or respirator replacement schedule.
5. Notify the supervisor of any problems associated with using a respirator. This includes a respiratory hazard that needs further evaluation, if the respirator is not providing adequate protection, and any concerns with the RPP.
6. Monitor air quality while wearing a respirator and calling Stop Work if PELs are exceeded or if the Stop Work action level for wildfire smoke is exceeded.

3.3.3 Use of Respirators

Respirator use by Floyd|Snider employees is done on a voluntary basis and may be done at any time when the use of an approved respirator may increase comfort or provide additional

protection when air quality conditions are still within a level considered to be safe for work. Voluntary use of respirators applies only when it has been determined that:

- Such respirator use will not in itself create a hazard.
- Airborne occupational exposures to hazardous chemicals will not exceed applicable PELs.
- Exposure to fine particles called PM2.5 in wildfire smoke does not exceed the Stop Work action level (refer to Table 3.1).
- No airborne biological hazard is present.
- No specification standards require the mandatory use of respirators.

3.3.4 Wildfire Smoke Exposure Control Plan

The Wildfire Smoke Exposure Control Plan is intended to address risks to employees working outside from potential exposure to wildfire smoke. This plan will be in effect whenever wildfires are present in the region (in Washington State, surrounding states, or British Columbia, Canada) and will continue to be implemented until such a time that wildfire smoke is no longer a health risk as determined by the air quality index (AQI). The greatest risk of wildfire coincides with the dry season from approximately mid-May through mid-October; however, fires can also occur outside of the typical dry season.

Smoke from wildfires contains chemicals, gases, and fine particles that can be harmful to human health. Breathing in smoke can cause immediate health effects such as coughing, trouble breathing, stinging eyes, a scratchy throat, runny nose, irritated sinuses, wheezing and shortness of breath, chest pain, headaches, an asthma attack, tiredness, and fast heartbeat (CDC 2013). The smallest and most harmful particulate matter in wildfire smoke and other air pollutants are PM2.5. PM2.5 are particles that are 2.5 micrometers or less in width. Increases in daily PM2.5 exposure has been linked to premature death in people with heart or lung disease and nonfatal heart attacks (USEPA 2020). Long-term exposure to PM2.5 is associated with increased rates of lung cancer and heart disease.

Those at increased risk for adverse health effects from wildfire smoke include the following:

- People with lung diseases such as asthma or chronic obstructive pulmonary disease (COPD), including bronchitis and emphysema, and those who smoke
- People with respiratory infections, such as pneumonia, acute bronchitis, bronchiolitis, colds, or flu, or those with or recovering from COVID-19
- People with existing heart or circulatory problems, such as irregular heartbeat, congestive heart failure, coronary artery disease, or angina, and those who have had a heart attack or stroke
- Adults over age 65 and pregnant women

- People with diabetes
- People with other medical or health conditions that can be exacerbated by exposure to wildfire smoke as determined by a physician

Program elements and protocols for wildfire smoke have been developed in accordance with emergency rule WAC 196-62-085 and additionally consider Cal/OSHA Title 8 California Code of Regulations Section 5141.1 regarding Wildfire Smoke.

The Wildfire Smoke Program includes the following elements:

1. Identification of Harmful Exposures (WAC 296-62-08530):

   When wildfire smoke is present, the site-specific HSO will monitor the AQI before each shift and periodically thereafter using U.S. Environmental Protection Agency's (USEPA's) AirNow,[1] available at www.airnow.gov, or a similar state or federal AQI modeling service. The HSO can also monitor real-time air quality using an air quality detector capable of measuring $PM_{2.5}$. The HSO will take actions consistent with the action levels presented in Table 3.1.

2. Hazard Communication (WAC 296-62-08540):

   The HSO will communicate wildfire smoke hazards to employees during the tailgate safety meeting and will record the AQI or $PM_{2.5}$ concentration on the tailgate meeting form when wildfire smoke is present in the air. The HSO will communicate available measures for employees to mitigate wildfire smoke exposure and the symptoms of smoke exposure.

3. Information and Training (WAC 296-62-08550):

   Employees will be trained in the information presented in this RPP (refer to Section 3.3.9), consistent with mandatory information presented in WAC 296-62-08590, prior to conducting work in the presence of wildfire smoke.

4. Exposure Symptom Response (WAC 296-62-08560):

   Employees displaying adverse symptoms of wildfire smoke exposure must be monitored to determine whether medical attention is necessary and may not be penalized for seeking medical treatment. Symptoms of wildfire smoke exposure most often include persistent coughing, difficulty breathing, and aggravation of existing respiratory conditions such as asthma. Provisions for prompt medical treatment will be established for each job site and reviewed during the tailgate safety meetings.

[1] AirNow reports air quality using the official U.S. AQI, a color-coded index designed to communicate whether air quality is healthy or unhealthy. AirNow is a partnership of the USEPA; National Oceanic and Atmospheric Administration; National Park Service; National Aeronautics and Space Administration; Centers for Disease Control and Prevention; and tribal, state, and local air quality agencies.

5. Exposure Controls (WAC 296-62-08560):

   Floyd|Snider will reduce workers' exposure to wildfire smoke by using the hierarchy of controls. Controls are encouraged whenever the ambient air concentration of PM2.5 is greater than 20.5 micrograms per cubic meter (µg/m^3; AQI 69) and required when the concentration of PM2.5 is greater than 55.5 µg/m^3 (AQI 151).

   A. Engineering controls will be implemented where feasible. Such controls include providing enclosed buildings, structures, or vehicles where the air is adequately filtered.

   B. If engineering controls are not sufficient to reduce exposure, Floyd|Snider will implement administrative controls. Such controls include relocating work to a location with a lower ambient air concentration of PM 2.5, changing work schedules to a time where the ambient air concentration of PM 2.5 is less, reducing work intensity, and providing additional rest periods.

   C. In addition to the standards provided in the emergency regulation (WAC 296-62-085), Floyd|Snider has developed action levels for wildfire smoke exposure to be followed at job sites. Table 3.1 shows the AQI categories, equivalent $PM_{2.5}$ measurement in micrograms per cubic meter, the level of health concern, and the action required. The HSO will stop work if the AQI for $PM_{2.5}$ is greater than 301 or if it is not possible to conduct field activities safely due to discomfort or decreased visibility.

   D. Where overnight stays are required in areas that do not have filtered indoor air, additional Floyd|Snider policies apply. If the AQI is forecasted to be greater than 301 overnight, or if the AQI exceeds 500 for several hours, the HSO, Floyd|Snider PM, and client PM will coordinate and decide whether demobilization to an off-site location is necessary.

6. Respiratory Protection (WAC 296-62-08570):

   Floyd|Snider will provide respirators at no cost to all employees for voluntary use in accordance with WAC 296-842 Safety Standards for Respirators. Employees are encouraged to use respirators any time the PM2.5 concentration is greater than 20.2 µg/m^3 (AQI 69), and especially when the PM2.5 concentration is 55.5 µg/m^3 (AQI 151) or greater.

Table 3.1
Action Levels for Wildfire Smoke

AQI Categories for PM2.5	PM2.5 (µg/m³)	Levels of Health Concern	Action [1]
0 to 50	0 to 12.0	Good	• Monitor air quality if wildfire smoke is present. • Stop work if employees have symptoms of smoke exposure.[2] All employees have Stop Work authority.
51 to 68	12.1 to 20.1	Moderate	• Monitor air quality. • Stop work if employees have symptoms of smoke exposure.[2] All employees have Stop Work authority. • Implement administrative and engineering controls.
69 to 150	20.2 to 55.4	Unhealthy for Sensitive Groups	• Monitor air quality. • Stop work if employees have symptoms of smoke exposure.[2] All employees have Stop Work authority. • Implement administrative and engineering controls. • Respirator provided for voluntary use; respirator use is strongly encouraged. • Take frequent breaks in an indoor space with filtered air.
151 to 200	55.5 to 150.4	Unhealthy	• Monitor air quality. • Stop work if employees have symptoms of smoke exposure.[2] All employees have Stop Work authority. • Implement administrative and engineering controls. • Respirator provided for voluntary use; respirator use is strongly encouraged. • Provide for frequent breaks—at least once per hour—in an indoor space with filtered air; stop work if an indoor space with filtered air is not available. • Accommodations must have filtered air for multi-day and overnight field events.
201 to 300	150.5 to 250.4	Very Unhealthy	• Monitor air quality. • Stop work if employees have symptoms of smoke exposure.[2] All employees have Stop Work authority. • Implement administrative and engineering controls. • Respirator provided for voluntary use; respirator use is strongly encouraged. • Take breaks at least once per hour in an indoor space with filtered air; stop work if an indoor space with filtered air is not available. • Accommodations must have filtered air for multi-day and overnight field events. • Reduce work hours; limit workday to no more than 8 hours on-site.
301 to 500	250.5 to 500.4	Hazardous	• **Stop work.** • Demobilize to an off-site work location if necessary.

Notes:
(1) Respirators can be worn at lower AQI levels based on personal preference. Respirators are provided at no cost to employees for use during any air quality conditions.
(2) Symptoms of wildfire smoke exposure most often include persistent coughing, difficulty breathing, and aggravation of existing respiratory conditions such as asthma.

3.3.5 Selection of Respirators

Employees can voluntarily use a respirator based on personal preference. Floyd|Snider will provide respirators at no cost to all employees for voluntary use in accordance with WAC 296-842 Safety Standards for Respirators. PPE is the last line of defense and should be considered after engineering and administrative controls are implemented.

The only approved respirator types to be used without fit testing are filtering facepiece respirators (FFRs), also known as N95 dust masks. Per WAC 296-842-10200, FFRs are any tight-fitting, half-facepiece, negative-pressure, particulate air purifying respirator with the facepiece composed mainly of filter material. These respirators do not use cartridges or canisters and may have sealing surfaces composed of rubber, silicone, or other plastic-like materials. Employees may elect to use respirators for other voluntary uses such as to control nuisance odors and may additionally elect to use respirators other than FFRs for protection from wildfire smoke if the respirator provides protection from PM2.5 equivalent to or greater than an FFR. Use of respirators other than FFRs is subject to fit testing requirements in accordance with the manufacturer specifications. Fit testing, if required for the selected respirator, is provided by Floyd|Snider at no cost to employees.

The National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention certifies N95 respirators including FFRs. A label or statement of certification by NIOSH should appear on the respirator or respirator packaging. KN95 respirators, which are filtering facepiece respirators manufactured to the Chinese particulate filtration standard equivalent to N95, are approved for respiratory protection by the U.S. Food and Drug Administration and may also be used if an adequate supply of NIOSH-approved respirators is not available.

Any employee who experiences any difficulties while wearing a respirator must immediately inform their supervisor. If an employee requests to wear a respirator other than an FFR, they must contact their supervisor to ensure the respirator is appropriate and properly fitted for the user.

3.3.6 Medical Evaluations

All Floyd|Snider field staff participate in a medical monitoring program and are evaluated biennially. This evaluation includes respiratory clearance and accomplishes the goal of medical clearance for this program on a voluntary use basis per WAC 296-842-11005. Workers with breathing problems such as asthma, COPD, or chronic heart and lung disease should communicate these conditions to their doctor to determine whether it is safe for them to voluntarily wear an FFR or other type of protection at work. Respirators restrict breathing and can put stress on the heart and lungs, which may worsen health symptoms.

3.3.7 Respirator Fit and Seal Check

Proper fit is necessary to get the most protection from a respirator. Fit testing is not required for FFRs, so employees are not required to participate in fit testing; however, fit testing can be provided at employee request. Note that facial hair, piercings, or facial abnormalities may disqualify an employee from using certain types of tight-fitting respirators. Shaving facial hair is recommended, but not required, for voluntary FFR or use. Employees who choose to use a tight-fitting elastomeric respirator (half- or full-face respirators) will require fit testing and additional training, which Floyd|Snider will provide at no cost to employees.

FFRs should fit according to the manufacturer's instructions. Elastic straps, a moldable nosepiece, or adhesive may be used to aid in sealing. A seal check should be performed after fitting the respirator to the face, using the following procedure:

1. Cover the respirator with both hands and exhale. If air leaks where the respirator seals against the face, readjust the respirator and nosepiece and try again. When a proper fit is achieved, the respirator should bulge from the face and not leak around the seal.
2. Cover the respirator with both hands and inhale. If air leaks where the respirator seals against the face, readjust the respirator and nosepiece and try again. When a proper fit is achieved, the respirator should collapse slightly and not leak around the seal.

The following video provides additional demonstration of fitting the respirator to the face and performing a seal check: https://www.youtube.com/watch?v=GmJxzGXeIvo

3.3.8 Respirator Replacement, Maintenance, and Storage

FFRs are disposable and generally designed for single use (i.e., one 8-hour day); however, the total hours of use may vary by manufacturer. Employees will replace respirators according to the manufacturer-recommended schedule, or a minimum of once per work day if not specified. Disposable respirators should also be immediately discarded if, at any time during use, they become damaged, deformed, dirty, or difficult to breathe through. The number of times an FFR is doffed and donned should be limited whenever possible. Respirators other than FFRs will be maintained or replaced (in full or in part, such as in the case of respirators with detachable cartridges) according to the manufacturer specification. Respirators will be given to a specific employee and may not be shared among employees.

Before donning, respirators will be inspected by the user for damage, deterioration, or improper functioning before use. FFRs will also be checked for proper sealing using the seal check procedures described in Section 3.3.7.

Respirators will be stored in a clean, dry, and sealed area in the field room, field vehicle, or a designated clean area on the job site.

3.3.9 Training

Training will be provided to all employees who voluntarily wear respirators. At a minimum, the training will cover the following information:

- Identification of the hazard (i.e., wildfire smoke)
- Floyd|Snider's policy on hazard communication and how to obtain current information regarding the AQI
- Potential health affects as a result of exposure to the hazard
- Employee rights regarding medical treatment for exposures
- Mitigation measures for smoke exposure
- Employer requirements to provide respirators under the L&I emergency rule
- The respirator's capabilities and limitations
- Proper fit, use, and maintenance of respirators

3.3.10 Record Keeping

As per WAC 296-842-11010, voluntary use of respirators does not require record keeping; however, all employees are required to read and sign this APP, and Floyd|Snider will retain a copy of the signature page and any additional relevant training materials.

3.4 BUILDING SECURITY

For security purposes, Union Square is equipped with an access card system. Computerized proximity cards let you enter the building on your own, any time, but prevent unauthorized access to the building.

To help maintain the integrity of this system:

- Do not let others follow you into the building when exiting and entering when entrances to the building are locked.
- Notify Tenant Services of lost access cards.
- Notify the company when transferring ownership of access cards.

General regular building hours are defined as the time between 6:00 a.m. and 6:30 p.m. After-hours are defined as the time between 6:30 p.m. and 6:00 a.m. During this time period, One and Two Union Square are in after-hours mode and will require an after-hours access card for entry into the buildings.

There is a security guard desk in the main lobby where any security-related incidents should be reported. The security guards are also available to escort employees to their vehicles if they are

feeling unsafe for any reason or can provide access to the office (after verifying your employment status by calling a Principal) if you do not have your access card or keys with you.

3.5 VEHICLE SAFETY

Floyd|Snider maintains a company vehicle for use during field work and to attend meetings. Personal vehicles and/or rental vehicles may be used if additional transportation is needed for a specific task. General vehicle safety and Floyd|Snider vehicle-specific procedures when driving for business purposes are described in the following sections.

3.5.1 General Vehicle Safety

Before driving a vehicle, always perform a safety check:

- Walk around and look for damage such as broken reflectors, damaged mirrors, windshield cracks, missing wiper blades, obviously low tire pressure or damage to tires, new dents, or scratches. Report new damage to the Equipment Manager. Do not drive a vehicle with obvious tire damage or an unrepaired windshield crack. Also note collision hazards in the immediate area.
- Check the vehicle emergency kit for the following items: first aid kit, potable water, eye wash, fire extinguisher, Mylar blanket, road flares, and collapsible traffic cones.
- Ensure that all items stored inside the vehicle are secure and will not slide or tumble during transport. Do not drive with unsecured loads.
- Start the vehicle and check that safety systems are working: headlights, turn signals, emergency flashers, headlights, brake lights, and windshield wipers. Check for dashboard warning lights and address any critical safety warnings (low tire pressure, low oil pressure, high engine temperature, antilock brake system, battery) immediately.

When driving a vehicle for business purposes, all traffic laws must be obeyed. Obey speed limits and all posted signs. Minimize distractions and stay aware of your surroundings. In addition to your safety, you are also a representative of the company behind the wheel and should not conduct any behaviors that would put you or Floyd|Snider in a negative light.

The following safety violations will not be tolerated by Floyd|Snider and will cause revocation of your driving privileges for company business purposes (even if they occur after business hours):

- Texting/cell phone use while driving (hands-free device permitted)
- Citations for reckless driving
- Use of alcohol or drugs before or while driving
- Carrying more passengers than available seatbelts

In the event of an accident, call 911 and follow the procedures in Section 4.3. In the event of a breakdown, call roadside assistance if possible in the area where you are located. If roadside assistance is not available, staff may perform basic tasks (such as addressing a flat tire) in order to be able to return to the office safely only if they are trained and feel comfortable to do so. If you are stuck, call your PM to arrange for emergency assistance.

In the event of a multi-day field effort or a late-night finish, all field equipment (high-dollar-value items) must be stored in a locked garage or other locked storage area for the night and should not be left in the vehicle.

3.5.2 Floyd|Snider Vehicle Safety

The Floyd|Snider vehicle is not equipped with 4-wheel drive, so no off-road driving should be attempted. If the project site is especially muddy or has limited access, an appropriate vehicle should be rented. No one other than Floyd|Snider employees (except for emergency personnel in case of emergency or qualified repair personnel) should be allowed to drive the company vehicle. Do not smoke in the company vehicle.

A first aid kit and fire extinguisher will be kept in the vehicle at all times. A checklist of supplies is kept in the vehicle bulkhead vertical file area and inside the door to the field room for reference. Additional safety supplies that are stocked in the vehicle include nitrile and work gloves, hearing protection, safety glasses, and basic decontamination equipment including Alconox solution, distilled water, disinfectant spray/wipes, and paper towels. If you have used these items, please notify the Health and Safety Committee so they can be replenished. The vehicle is also equipped with basic maintenance supplies including a jack, air pump, and spare tire. The gas tank should always be left at least half full before returning the company vehicle to the garage. The vehicle engine has a minimum octane rating and should be filled with premium gasoline.

Report vehicle warning lights immediately to the Equipment Manager or a designated alternate in the event that the Equipment Manager is not available. The Equipment Manager will work with you to determine a plan to safely address the warning light. If you cannot use the field vehicle safely, notify your PM to assist you with arranging an alternate vehicle. Tire pressure warning lights should be addressed immediately using the pump stored in the van or at a service station if a station is readily available—never drive a vehicle with insufficient tire pressure.

The Equipment Manager will be responsible for making sure the following routine maintenance is performed (but please notify them immediately if you notice any other problems):

- Oil changes and periodic routine maintenance per dealer schedule
- Monthly walk-around check (tires, lights, damage, etc.)
- Detailing when needed

3.6 CONTROLLED SUBSTANCE ABUSE

Floyd|Snider has a strong commitment to provide a safe and drug-free workplace for its employees.

Drug or alcohol testing of current employees may be performed where (a) there are reasonable grounds to believe an employee is under the influence of or suspected of consuming alcohol or using marijuana during work hours or using illegal drugs at any time; (b) as a follow-up to a rehabilitative program; or (c) on a random basis when health and safety requirements for clients or projects necessitate testing.

If the alcohol or drug test reveals positive results, the employee may be suspended pending evaluation of the situation by management.

An employee who voluntarily seeks assistance on a timely basis for an alcohol- or drug-related problem, prior to the company identifying the problem, may do so without jeopardizing their employment status, provided the prescribed treatment is followed and work performance is acceptable. In some cases, temporary reassignment may be necessary.

If an employee is undergoing a prescribed medical treatment with a substance that may alter physical or mental capacity, the employee must report this to the Health and Safety Administrator, particularly if they will be conducting field work. The Health and Safety Administrator will coordinate with the Board of Directors, who will determine how to manage the affected employee's work load.

Any manager who observes or receives a report of alcohol or drug use must promptly investigate the allegations in a confidential manner. The Board of Directors should also be notified immediately. Any other employee who observes or has knowledge of a violation, whether by an employee or others, has an obligation to promptly report this to their immediate supervisor. If an employee's immediate supervisor is suspected of violating the company's drug and alcohol policy, the report should be made directly to the Board of Directors.

In any instance where there exists an imminent threat to the safety of persons or property, an employee shall immediately contact a Principal.

4.0 Emergency Procedures

This section defines the emergency procedures for Floyd|Snider. Reasonably foreseeable emergency situations include medical emergencies; accidental release of hazardous materials or hazardous waste; and general emergencies such as vehicle accident, fire, thunderstorm, and earthquake.

A muster point should be designated for all personnel. The Floyd|Snider office emergency muster point is at the Paramount Theatre, on the corner of Pine Street and 9th Avenue. A map of the office evacuation route and a map of the locations of first aid kits, fire extinguishers, and AEDs is posted in all communal office spaces including kitchens and conference rooms, is available on the Floyd|Snider SharePoint home page. On a job site, the SSO should designate a muster point that is clear of adjacent hazards and not located downwind of site activities and communicate this location to the field team each day. In an emergency, all personnel and visitors will evacuate to the muster point for roll call.

It is important that each person understand their role in an emergency and that they remain calm and act efficiently to ensure everyone's safety. Expected actions for potential emergency situations are outlined in the following sections.

4.1 MEDICAL EMERGENCIES

In the event of a medical emergency, the following procedures should be used:

- Stop any imminent hazard if you can safely do so.
- Remove ill, injured, or exposed persons from immediate danger if moving them will clearly not cause them harm and no hazards exist to the rescuers.
- Evacuate other personnel from the immediate vicinity until the ill, injured, or exposed persons have been evacuated and it is safe for work to resume.
- If serious injury or a life-threatening condition exists, call 911 for paramedics, fire department, and police. When in doubt, contact emergency services; do not drive a seriously ill or injured person to the hospital unless emergency services cannot be summoned (for example, if phone service is out or there is not an ambulance that can reach the location).
- Clearly describe the location, injury, and conditions to the dispatcher. Designate a person to go to the site entrance and direct emergency equipment to the injured persons. Provide the responders with information about any chemical hazards that might be present on a job site.
- Trained personnel may provide first aid/CPR if it is necessary and safe to do so. Remove contaminated clothing and PPE only if this can be done without endangering the injured person.

- Once more highly trained personnel (i.e., emergency services) have taken over care of the person experiencing the medical emergency, immediately contact the staff member's designated emergency contact person.
- If you are in the field, notify your PM and HSO/SS.
- If a person experiencing a medical emergency is taken to the hospital, another staff member should accompany whenever possible and remain at the hospital until a designated emergency contact person arrives.
- Immediately implement steps to prevent recurrence of the accident.

4.2 ACCIDENTAL RELEASE OF HAZARDOUS MATERIALS OR WASTES

In the event of a release of a hazardous material or waste:

1. Evacuate all personnel to the designated emergency muster point until it is safe for work to resume.
2. If you are in the field, instruct a designated person to contact the PM or HSO/SS and confirm a response. If a release occurs in the office, the Floor Wardens will contact building security.
3. Contain the spill, if it is a known material, is possible, and can be done safely.
4. If the release is not stopped, contact 911 to alert the fire department.
5. Contact the Washington State Emergency Response Commission at 1 (800) 258-5990 to report the release.
6. Initiate the cleanup process. Cleanup must be performed by professionals trained in cleanup response for the type of material released.
7. Submit a written report to the Washington State Department of Ecology in the event of a reportable release of hazardous materials or wastes.

4.3 OTHER EMERGENCIES AND NATURAL DISASTERS

Vehicle Accident

In the event of an accident:

- Check yourself and your passengers and, if safe to do so, any other persons involved in the accident for serious injuries. If anyone is seriously injured, call 911 and wait for emergency personnel.
- If the vehicle can be moved, move to the shoulder or side of the road out of the way of traffic before calling 911. Do not leave the scene of the accident, and avoid engaging in conversation with other persons involved, aside from confirming injury status.
- If the vehicle cannot be moved, get yourself and your passengers to safety if possible. If the vehicle is disabled in a place with fast moving traffic (such as a multi-lane freeway), it may be safest to wait in the vehicle. Use your best judgment.

- If you are able to move the vehicle to the shoulder, use road flares (located in the vehicle emergency kit) to warn oncoming drivers.
- Wait for police to arrive and fill out an accident report.
- Call your PM or HSO/SS to report the accident. In the case of a minor accident, the PM or HSO/SS will consult with the Equipment Manager to determine whether the vehicle should be driven back to the office or towed to a repair facility. Contact roadside assistance if towing is needed.

Fire

During the incipient phase of a fire, the available fire extinguisher may be used by persons trained in putting out fires, if it is safe for them to do so.

If a fire is identified in the office building (either by smell or by the fire alarm), walk to the nearest emergency exit and walk down the stairs (do not use the elevator). Walk to the emergency muster point. Use common sense during a fire to avoid injury if areas are inaccessible.

In the case of a fire in a job site, work shall be halted and all onsite personnel will be immediately evacuated to the emergency muster point, if the fire cannot be extinguished. The local police/fire department shall be notified if the emergency poses a continuing hazard by calling 911.

Thunderstorm

A thunderstorm may present danger of lightning strike any time that visible lightning or audible thunder are present.

In the event of a thunderstorm, seek shelter inside a building if possible. Avoid concrete walls and floors, corded phones, and puddles. When a thunderstorm is accompanied by high winds, also avoid windows. If sheltering in a building is not possible, shelter inside your vehicle, and avoid direct contact with any metal objects in contact with the frame of the vehicle.

Do not resume work activities outdoors until at least 30 minutes have elapsed since the last thunder or lightning was observed.

Earthquake

If you are inside a building during an earthquake, the area near the exterior wall of a building is the most dangerous place to be. Windows, facades, and architectural details are often the first parts of the building to collapse. To stay away from this danger zone, stay inside if you are inside and outside if you are outside. In a high-rise: drop, cover, and hold on. Face away from windows and other hazards. Do not use elevators. Do not be surprised if sprinkler systems or fire alarms activate. Once the earthquake is over, be alert for aftershocks that might occur, follow instructions of your Floor Warden or building security, take your emergency kit or emergency supplies, proceed to the emergency exit, and walk down the stairs. Walk to the emergency

muster point. The above are general guidelines and are not meant to apply to every situation, so please use common sense during an earthquake to avoid injury. Additional office safety precautions for earthquakes are posted in the Production Room of the Floyd|Snider office and posted to the Health and Safety department page on SharePoint.

If you are on a jobsite when an earthquake occurs, move away from buildings, overhead power lines, and any other structures that may collapse. Get down low and stay down until the shaking stops to avoid injury. If you are in a moving vehicle, stop as quickly and safely as possible. Move to the shoulder or curb, away from utility poles, overhead wires, and under- or overpasses. Stay in the car and set the parking brake. Turn on the radio for emergency broadcast information. A vehicle may jiggle violently on its springs, but it is a good place to stay until the shaking stops. If a power line falls on the vehicle, stay inside until a trained person removes the wire. After the shaking stops, take your emergency supplies and proceed to the emergency muster point if it is safe to do so. Call your PM or HSO/SS when it is safe to do so.

4.4 EMERGENCY COMMUNICATIONS

Emergencies at Union Square will be communicated by building security using the public address system. If an emergency announcement is made, pause what you are doing and listen to the entire message. Emergencies involving the Floyd|Snider office only may be communicated over the office telephone system.

In the case of a job site emergency, signals may vary by site and should be discussed at daily tailgate meetings so all personnel on-site are aware of the site-specific signals and alarms. In general, horns (vehicle or airhorns) are used as needed to signal the emergency. One long (5-second) blast will be given as the emergency/stop work signal. If horns are not working, waving of arms is typically used to signal an emergency. In any emergency, all personnel will evacuate to the designated muster point and await further instruction.

After an emergency is resolved, the involved personnel or management will meet and debrief on the incident—the purpose is not to fix blame, but to improve the planning and response to future emergencies. The debriefing will review the sequence of events, what was done well, and what can be improved. The debriefing will be documented in a written format and filed by the Health and Safety Administrator.

4.5 EMERGENCY EQUIPMENT

The following minimum emergency equipment will be readily available in the office and at all job sites and functional at all times:

- First Aid Kit: Contents approved by the HSO/SS, including two blood-borne pathogen barriers. First aid kits are located in the company vehicle; a personal vehicle kit is located in the field room and should be used when field staff drive personal or rental vehicles; and in the office, first aid kits are located at each fire extinguisher location in the north hall, west hall, main kitchen, and large conference room. The location of

first aid kits and fire extinguishers will also be posted on maps kept in communal office spaces (kitchens and conference rooms).

- Portable fire extinguishers are included in the field first aid/safety kits and are also located in the office in the north hall, west hall, main kitchen south entrance, and Cedar Conference room.
- A copy of the HASP if on a job site.
- A binder of Safety Data Sheets (SDSs) for commonly encountered chemicals and all potential contaminants of concern that may be present on a job site. This binder is kept in the document organizer compartment of the company vehicle and an additional copy is kept in the field room.

4.6 INCLEMENT WEATHER

Occasionally, there are weather conditions, like snow, that make travel difficult. If the Seattle Public Schools are closed for the day due to hazardous road conditions, then the office will also be closed out of concern for your safety. Any field work scheduled during an office closure due to inclement weather should also be postponed.

4.7 CATASTROPHIC EVENTS

Floyd|Snider has formed an Emergency Planning Committee to develop preparation, communication, and safety plans to implement if a catastrophic event occurs. A catastrophic event is an event that disrupts or destroys critical infrastructure, such as a large-scale earthquake or other natural disaster.

Emergency Kits

Each staff member is provided one emergency kit backpack in case of emergencies that disrupt transportation or utilities. These backpacks include a map with critical structures, contact list and work plan, 32-ounce water bottle (to be filled and replaced every 6 months by the employee), additional 14-ounce water bottle and Platypus water container, water purification tablets, food bars, magnesium firestarter and matches, a multi-purpose tool, an LED flashlight and extra batteries, an emergency radio, an emergency (heat reflective) blanket, rags, nylon rope, a tarp and trash bags, duct tape, hand cleanser, Super Glue, and a hiker's first aid kit. Employees should provide their own raingear, extra socks, walking/hiking shoes, family plan, sunscreen, and 3-day supply of critical medicines. Not all packs are exactly the same, but all should include the items listed above. The Emergency Planning Committee will send regular reminders to check emergency kits and replace expired items.

Staff members should keep their emergency contact card up to date, listing phone numbers for whom to contact if they are unable to make calls themselves. Emergency contact cards should be kept in the front pocket of the backpack, where they can be easily located by others.

Staff should familiarize themselves with the contents of the emergency backpack to make sure all necessary items are included and that they are operational. The Emergency Planning Committee will remind staff every 6 months to check and update backpack contents (replace water in water containers, check the expiration date on the nutrient bars, update contact list if it is not current, etc.). Staff are responsible for keeping the employee contact list updated and having a sensible pair of shoes available in the office.

WhatsApp Emergency Contact Group

The purpose of our WhatsApp group is for group coordination needs during periods of emergency. It will be an easy way for management to communicate next steps back to the entire group, such as the status of the office/IT and expected timelines for returning to work. It also serves as an additional way to check in and communicate that staff and family are safe. Remember, immediately after an emergency, the initial call to check in with Jessi should still be made. Join the Floyd|Snider group on WhatsApp:

1. Download the WhatsApp app on to your phone and setup your account
2. Join the "F|S Emergency Contact" group by following the instructions on the Health & Safety Department site: https://floydsnider.sharepoint.com/Dept/Safety/SitePages/Emergencies.aspx#emergency-coordination-whatsapp

At the 6-month check-in time for backpack contents, employees should also confirm that they are still connected and included in the WhatsApp group. If an employee has been removed from the group (which can occur during software updates, etc.), the employee should notify the Emergency Planning Committee to have the group invitation resent so they can rejoin the group.

What to Do if You Are in the Office When a Disaster Occurs

If you are in the office when an emergency occurs, first and foremost is to remain safe. Wait until the building gives instructions over the PA system, then take your emergency kit and exit the building safely and quickly to meet at the Floyd|Snider muster point at the Paramount Theatre, on the corner of Pine Street and 9th Avenue. Once you have checked in with other Floyd|Snider staff there, you should find your way home safely to check on family and property. Jessi Massingale has been identified as the Disaster Contact. One person from the muster point will contact Jessi once all employees have been safely evacuated. Floyd|Snider will use the WhatsApp group to communicate next steps, as well as email (if available). WhatsApp is described in more detail above.

What to Do if You Are Not in the Office When a Disaster Occurs

If you are not in the office when an emergency occurs, the first thing to do after ensuring your safety and the safety of your family and property, is to text Jessi or Matt Massingale in Bend, Oregon. Report that you are okay and await further instructions. Other management team

members can also be contacted if needed. Floyd|Snider will use the WhatsApp group to communicate next steps, as well as email (if available).

In Emergency, Text Jessi/Matt in Bend		
Jessi	206.683.4307 (cell)	
Matt	206.255.2799 (cell)	541.241.6255 (work)
Management Team Numbers		
Allison	206.722.2460 (cell)	206.842.4484 (home)
Kate	206.375.0762 (cell)	206.781.7682 (home)
Tiffany	206.779.2806 (cell)	

Building Access

Depending on the severity of the disaster, Union Square may be closed for inspection, bus routes may be disrupted, and cell phone service may be limited. The nature and likely duration of the emergency aftermath will affect decision-making around working at the office during this time. Floyd|Snider will send out communications via WhatsApp and/or email with information on when to resume work and when it is safe to return to the office.

5.0 Hazard Awareness and Mitigation

In general, there are three broad hazard categories that may be encountered on the job: chemical exposure hazards, fire and explosion hazards, and physical hazards. Sections 5.1 through 5.3 discuss the specific hazards that fall within each of these broad categories and ways to mitigate these hazards.

Additional hazard analysis for specific chemicals present or tasks to be performed at a job site should be detailed in the HASP for the site.

5.1 CHEMICAL EXPOSURE HAZARDS

Potential toxic effects can occur from significant acute or chronic exposure to hazardous chemicals.

Hazardous products used in the office or on the job site should be sealed and stored in places where they cannot be easily spilled. Always follow manufacturer instructions for storage and use of hazardous chemicals. Discard chemicals no longer in use in accordance with manufacturer's instructions, and discard chemicals if containers are damaged, corroded, or otherwise leaking. Consider nontoxic alternatives to cleaning and other products when possible. Consider use of gloves or eye protection when handling or using chemicals with the potential to irritate eyes or skin if contacted.

On contaminated sites and on work sites where hazardous chemicals are used, chemical exposure hazards, monitoring procedures, and decontamination procedures should be detailed in the site HASP.

5.2 FIRE AND EXPLOSION HAZARDS

When storage of material posing a fire and explosion hazards is necessary, such material will be stored in containers approved by the Washington State Department of Transportation in a location not exposed to strike hazards and provided with secondary containment. A minimum 2A:20B fire extinguisher will be located within 25 feet of the storage location and where refueling occurs. Any subcontractors bringing flammable and combustible liquid hazards to a job site are responsible for providing appropriate material for containment and spill response, which should be addressed in their respective HASP, Job Hazard Analysis (JHA), or Job Safety Analysis (JSA). Transferring of flammable liquids (e.g., gasoline) will occur in areas with containment to capture any spillage, and only after making positive metal-to-metal connection between the containers, which may be achieved by using a bonding strap. Storage of ignition and combustible materials will be kept away from fueling operations.

5.3 PHYSICAL HAZARDS

When working in or around any hazardous or potentially hazardous substances or situations, all personnel should plan all activities before starting any task. Personnel shall identify health and

safety hazards involved with the work planned. If you have concerns or uncertainty about the safety of a given task, always consult with your PM or, if in the field, with your HSO/SS to determine how the task can be performed in the safest manner.

All field personnel will adhere to general safety rules including wearing appropriate PPE—hard hats, steel-toed boots, high-visibility vests, safety glasses, gloves, and hearing protection, as appropriate. Eating, drinking, and/or use of tobacco or cosmetics will be restricted in all work areas. Personnel will prevent splashing of liquids containing chemicals and minimize dust emissions.

The following table summarizes a variety of physical hazards that may be encountered during work activities. For convenience, these hazards have been categorized into several general groupings with recommended preventative measures.

Hazard	Cause	Prevention
Head strike	Falling and/or sharp objects, bumping hazards	Hard hats will be worn by all personnel at all times when overhead hazards exist.
Foot/ankle twist, crush, slip/trip/fall	Sharp objects, dropped objects, uneven and/or slippery surfaces	Steel-toed boots must be worn at all times on site while heavy equipment is present. Pay attention to footing on uneven or wet terrain and do not run. Keep work areas organized and free from unmarked trip hazards.
Hand cuts, splinters, and chemical contact	Hands or fingers pinched or crushed; chemical hazards; cut or splinters from handling sharp/rough objects and tools	Nitrile safety gloves will be worn to protect the hands from dust and chemicals. Leather or cotton outer gloves will be used when handling sharp-edged rough materials or equipment. Refer to preventive measures for mechanical hazards below.
Eye damage from flying materials, or splash hazards	Sharp objects, poor lighting, exposure due to flying debris or splashes	Safety glasses will be worn at all times on a job site. If a pressure washer is used to decontaminate heavy equipment, a face shield will be worn over safety glasses or goggles. Care will be taken during decontamination procedures to avoid splashing or dropping equipment into decontamination water.

Hazard	Cause	Prevention
Electrical hazards	Electrical cord hazards	Make sure that no damage to extension cords occurs. If an extension cord is used, make sure it is the proper size for the load that is being served and rated SJOW or STOW (an "-A" extension is acceptable for either) and inspected prior to use for defects. The plug connection on each end should be of good integrity. Insulation must be intact and extend to the plugs at either end of the cord. All portable power tools will be inspected for defects before use and must be either double-insulated or grounded with a ground-fault circuit interrupter.
Mechanical hazards	Heavy equipment such as drilling machine	Ensure the use of competent operators, backup alarms, "kill" switches, regular maintenance, daily mechanical checks on all hoses and cables, and proper guards. Verify that "whip checks" or similar securing devices are installed on "quick-connections," where the failure of high-pressure connections could lead to the whipping of hoses. Discuss the need for plastic sheeting or other methods to contain drips (hydraulic oil, motor oil, etc.) to determine if measures are needed to prevent releases to the ground. Subcontractors will supply their own JHA, HASP, or JSA. All personnel will make eye contact with operator and obtain a clear OK before approaching or working within a hazardous radius of the heavy equipment.
Noise damage to hearing	Machinery creating more than 85 decibels time-weighted average, less than 115 decibels continuous noise, or peak at less than 140 decibels	Wear earplugs or protective ear covers when a conversational level of speech is difficult to hear at a distance of 3 feet or if an employee must shout to be heard by nearby coworkers; when in doubt, a sound level meter may be used on site to document noise exposure.

Hazard	Cause	Prevention
Strains from improper lifting	Injury due to improper lifting techniques, overreaching/ overextending, lifting overly heavy objects	Use proper lifting techniques and mechanical devices where appropriate. The proper lifting procedure first involves testing the weight of the load by tipping it. If in doubt, ask for help. Do not attempt to lift a heavy load alone. Take a good stance and plant your feet firmly with legs apart, one foot farther back than the other. Make sure you stand on a level area with no slick spots or loose gravel. Use as much of your hands as possible, not just your fingers. Keep your back straight, almost vertical. Bend at the hips, holding load close to your body. Keep the weight of your body over your feet for good balance. Use large leg muscles to lift. Push up with one foot positioned in the rear as you start to lift. Avoid quick, jerky movements and twisting motions. Turn the forward foot and point it in the direction of the eventual movement. Never try to lift more than you are accustomed to lifting.
Traffic hazards	Vehicle traffic and hazards when working near active operations	When working in or near the right-of-way, orange cones and/or flagging will be placed around the work area. Safety vests will be worn at all times while conducting work in or near the right-of-way. Multiple staff will work together (buddy system) and spot traffic for each other. Avoid working with your back to traffic whenever possible.
Cold stress	Cold temperatures and related exposure	Workers will ensure appropriate clothing, stay dry, and take breaks in a heated environment when working in cold temperatures. Further detail on cold stress is provided in Section 5.3.1.
Heat exposure	High temperatures exacerbated by PPE, dehydration	Workers will ensure adequate hydration, shade, and breaks when temperatures are elevated. Further detail on heat stress is provided in Section 5.3.2.
Accidents due to inadequate lighting	Improper illumination	Work will proceed during daylight hours only or under sufficient artificial light.
Drowning hazards	Work in or near water	Wear a personal flotation device at all times when working in or near water. Be aware of surroundings including head strike and trip hazards that could cause a fall into water.

Hazard	Cause	Prevention
Slip, trip, and fall hazards	Working in vegetated areas, areas with uneven ground surface, or areas with obstructions	Watch your step when walking and minimize distractions. Establish a path free of obstructions before mobilizing equipment.

5.3.1 Cold Stress

Exposure to moderate levels of cold can cause the body's internal temperature to drop to a dangerously low level, causing hypothermia. Symptoms of hypothermia include slow, slurred speech, mental confusion, forgetfulness, memory lapses, lack of coordination, and drowsiness.

To prevent hypothermia, stay dry and avoid exposure. On a job site, personnel will have access to a warm, dry area, such as a vehicle, to take breaks from the cold weather and warm up. Site personnel will be encouraged to wear sufficient clothing in layers such that outer clothing is wind- and waterproof and inner layers retain warmth (wool or polypropylene), if applicable. Site personnel will keep hands and feet well protected at all times. The signs and symptoms and treatment for hypothermia are summarized below.

Signs and Symptoms

- Mild hypothermia (body temperature of 98–90 degrees Fahrenheit [°F])
  - Shivering
  - Lack of coordination, stumbling, fumbling hands
  - Slurred speech
  - Memory loss
  - Pale, purplish gray, or dusky and cold skin
- Moderate hypothermia (body temperature of 90–86 °F)
  - Shivering stops
  - Unable to walk or stand
  - Confused and irrational
- Severe hypothermia (body temperature of 86–78 °F)
  - Severe muscle stiffness
  - Very sleepy or unconscious
  - Ice cold skin
  - Death

Treatment of Hypothermia—Proper Treatment Depends on the Severity of the Hypothermia

- Mild hypothermia
  - Move to warm area.
  - Stay active.
  - Remove wet clothes, replace with dry clothes or blankets, and cover the head.
  - Drink warm (not hot) sugary drinks.
- Moderate hypothermia
  - All of the above, plus:
    - Call 911 for an ambulance.
    - Cover all extremities completely.
    - Place very warm objects such as hot packs or water bottles on the victim's head, neck, chest, and groin.
- Severe hypothermia
  - Call 911 for an ambulance.
  - Treat the victim very gently.
  - Do not attempt to re-warm—the victim should receive treatment in a hospital.

Frostbite

Frostbite occurs when the skin actually freezes and loses water. In severe cases, amputation of the frostbitten area may be required. Although frostbite usually occurs when the temperatures are 30 °F or lower, wind chill factors can allow frostbite to occur in above-freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands. Frostbite symptoms include cold, tingling, stinging, or aching feeling in the frostbitten area followed by numbness and skin discoloration: Paler skin may change from red to purple, then to white or very pale, and darker skin may become more pale, dusky, or purplish. Frostbitten skin will be waxy and firm while still frozen and may redden, swell, or blister when thawed. Should any of these symptoms be observed, wrap the area in soft cloth, do not rub the affected area, and seek medical assistance. Call 911 if the condition is severe.

Protective Clothing

Wearing the right clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. The following are recommendations for working in cold environments:

- Wear at least three layers of clothing.
  - An outer layer to break the wind and allow some ventilation (like Gortex or nylon)

  - A middle layer of down or wool to absorb sweat and provide insulation even when wet
  - An inner layer of cotton or synthetic weave to allow ventilation
- Wear a hat—up to 40 percent of body heat can be lost when the head is left exposed.
- Wear insulated boots or other footwear.
- Keep a change of dry clothing available in case work clothes become wet.
- Do not wear tight clothing—loose clothing allows better ventilation.

Work Practices

- Drinking—Drink plenty of liquids, avoiding caffeine and alcohol. It is easy to become dehydrated in cold weather.
- Work Schedule—If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold in heated vehicles.
- Buddy System—Work in pairs to keep an eye on each other and watch for signs of cold stress.

5.3.2 Heat Stress

To avoid heat-related illness, current regulations in WAC 296-62-095 through 296-62-09570 will be followed during all outdoor work activities. These regulations apply to any outdoor work environment from May 1 through September 30 when workers are exposed to temperatures greater than 89 °F when wearing breathable clothing, greater than 77 °F when wearing double-layered woven clothing (such as jackets or coveralls), or greater than 52 °F when wearing non-breathing clothing such as chemical resistant suits or Tyvek. Floyd|Snider will identify and evaluate temperature, humidity, and other environmental factors associated with heat-related illness including, but not limited to, the provision of rest breaks that are adjusted for environmental factors and encourage frequent consumption of drinking water. Drinking water will be provided and made readily accessible in sufficient quantity to provide at least 1 quart per employee per hour. All Floyd|Snider personnel performing outdoor work will be informed and trained for responding to signs or symptoms of possible heat-related illness and accessing medical aid.

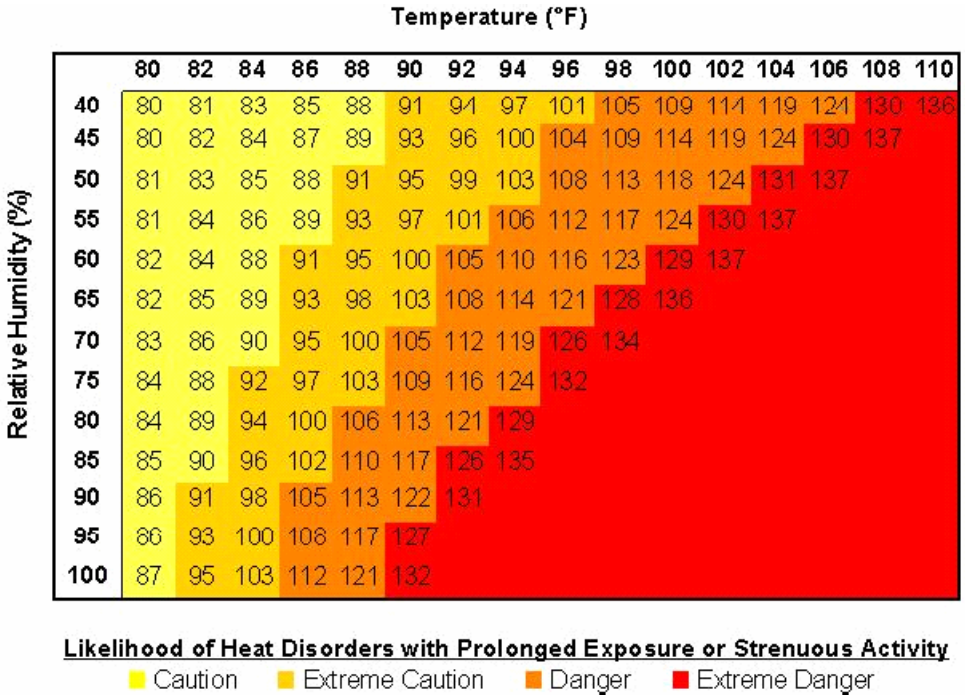
Employees showing signs or demonstrating symptoms of heat-related illness must be relieved from duty and provided with a sufficient means to reduce body temperature, including rest areas or temperature-controlled environments (i.e., air conditioned vehicle). Any employee showing signs or demonstrating symptoms of heat-related illness must be carefully evaluated to determine whether it is appropriate to return to work or whether medical attention is necessary.

Any incidence of heat-related illness must be immediately reported to the employer directly through the HSO/SS.

The signs, symptoms, and treatment of heat stress include the following:

Condition	Signs/Symptoms	Treatment
Heat cramps	Painful muscle spasms and heavy sweating	Increase water intake, rest in shade/cool environment.
Heat syncope	Brief fainting and blurred vision	Increase water intake, rest in shade/cool environment.
Dehydration	Fatigue, reduced movement, headaches	Increase water intake, rest in shade/cool environment.
Heat exhaustion	Pale and/or clammy skin, possible fainting, weakness, fatigue, nausea, dizziness, heaving sweating, blurred vision, body temperature slightly elevated	Lie down in cool environment, water intake, loosen clothing, and call 911 for ambulance transport if symptoms continue once in cool environment.
Heat stroke	Cessation of sweating, skin hot and dry, red or flushed face, high body temp, unconsciousness, collapse, convulsions, confusion or erratic behavior; life-threatening condition	**Medical Emergency!! Call 911** for ambulance transport. Move victim to shade and immerse in water.

If site temperatures are forecast to exceed 85 °F and physically demanding site work will occur in impermeable clothing, the HSO/SS will promptly consult with a certified industrial hygienist and a radial pulse monitoring method will be implemented to ensure that heat stress is properly managed among the affected workers. The following heat index chart indicates the relative risk of heat stress.



5.3.3 Allergies and Biohazards

Allergens capable of triggering a severe reaction may be present in the office environment or the job site. Outdoor work presents additional biohazards such as bees and other insects and wildlife.

Staff with severe allergies should make these allergies known to Floyd|Snider and maintain appropriate preventative medications (EpiPen, Benadryl, etc.) as directed by their physician in a location that can be easily accessed in case of emergency. The locations of these medications should be shared with the Floor Wardens, along with instructions for delivery if needed.

In the field, persons with allergies to bees or other insects will make the HSO/SS aware of their allergies and will avoid areas where bees/insects are identified. Controls such as repellents, hoods, nettings, masks, or other personal protection may be used. Report any insect bites or stings to the HSO/SS and seek first aid, if necessary. Especially when working during the summer months, staff should monitor the work area for evidence of insect nests of stinging insects. A nest may be nearby if multiple flying insects are observed in the area, or if flying insects appear to be entering and leaving the same locations. Nests may be buried underground, located in vegetated areas, or in structures such as well monuments, vaults, and buildings.

Inspect the work area for hazardous plants, medical waste (syringes and similar items), and indications of hazardous organisms, and avoid such areas if possible. On job sites, personnel will maintain a safe distance from any urban wildlife encountered, including stray dogs, raccoons, and rodents, to preclude a bite from a sick or injured animal.

A severe allergic reaction, or anaphylaxis, is a rapid immune response that may be fatal if untreated. Persons experiencing anaphylaxis require medical care beyond preventative medication or first aid. The signs of anaphylaxis may include the following:

- Extensive skin rashes, itching, or hives
- Swelling of the lips, tongue, or throat
- Shortness of breath, trouble breathing, or wheezing
- Dizziness and/or fainting
- Stomach pain, bloating, vomiting, or diarrhea
- Uterine cramps
- Feelings of panic or dread

5.3.4 Fatigue

Worker fatigue can impair judgment and increase the risk of injuries on the job site. Fatigue may be caused by physical exertion from difficult tasks, extended working hours, and environmental challenges, including exposure and extreme weather. Fatigue can be caused by working extended hours for a duration of 1 week or more (including overtime work, consecutive long shifts, and extended work weeks) or by extremely physically and mentally demanding work of any duration. Tasks should be assessed individually for risk of fatigue. Variable weather conditions (high and

low temperatures, sustained strong winds) can place additional physical and mental strain on field personnel.

5.3.4.1 Fatigue Symptoms and Self-Monitoring

Signs and symptoms of fatigue may present similarly to inebriation and can include:

- Reduced fine motor skills and coordination (e.g., tripping or dropping items)
- Impaired concentration
- Poor communication
- Poor judgment
- Mood swings or irritation

The above are typical symptoms of fatigue, but individuals can also experience or present fatigue in other ways that may be less obvious to an observer. The HSO/SS should additionally check in with staff members to ensure they are not experiencing any symptoms of fatigue that may impair their judgment or coordination in the field.

5.3.4.2 Managing Fatigue

Fatigue should be managed by limiting working hours and implementing rest days. Signs and symptoms of fatigue and fatigue management should be discussed, when applicable, at the daily tailgate and debrief meetings.

Potential actions to minimize fatigue include the following:

- Plan to get 7 to 9 hours of sleep each night
- Take a lunch break inside, or out of the weather
- Take snack and hydration breaks throughout the day
- Take a late start, half-day, or rest day during the field event

5.3.4.3 Fatigue Response Actions

In job situations where fatigue is likely, the HSO/SS should monitor employee fatigue using the following guide.

If the answer is yes to any of the following questions, the HSO/SS should consider implementing a shortened work day, light duty, or a day off for the affected employee.

- Do environmental factors pose an additional fatigue load (e.g., exposure to extreme hot/cold weather or wind)?
- Has the team member exhibited signs of fatigue?
- Has the team member worked on a physically intense task?

- Has the team member worked through the day without taking regular breaks to eat, stay hydrated, and rest?
- Has the team member had less than 6 hours of sleep in the past 24 hours?
- Did the team member work more than 12.5 hours in the past day?

If the answer is yes to either of the following questions, the HSO/SS will implement a day off for the affected employee.

- Did the team member work more than 75-80 hours in the past week?
- By the end of the shift, has the team member been awake for more than 17 hours?

Employees should also self-monitor for signs of fatigue and immediately report to the HSO/SS if fatigue becomes a concern.

If fatigue becomes a team-wide safety issue on the job site, the HSO/SS should coordinate with the PM to determine the actions that will be taken at the project level to manage fatigue. Actions may include adding team members, changing work practices, and/or adjusting the work schedule.

6.0 Job Site Controls

This section describes the best practices to be implement on a field job site to protect personnel and the environment. These best practices are considered the minimum controls for any job site, and additional site-specific protocols should be detailed in the site-specific HASP.

- All site work should be completed in teams when possible. Teams should establish a primary means of communication on-site and with offsite contacts (generally via cell phones or radios on-site). An agreed-upon system of alerting via air horns and/or vehicle horns may be used around heavy equipment to signal an emergency if shouting is ineffective.
- Work area perimeter controls should be established to ensure that members of the public do not enter the work area and limit the potential for chemical exposure associated with site activities when hazardous materials may be present. These work areas include a support zone, a contaminant reduction zone (decontamination area), and an exclusion zone.
- Staff will take precautions to prevent contamination:
    - Inspect all PPE prior to entering the exclusion zone.
    - Avoid walking through puddles or areas of known or obvious surface soil contamination.
    - Do not carry unnecessary items into the exclusion zone.
    - Take care to limit contact with heavy equipment and vehicles.
    - Protect the ground surface when processing samples and wipe down or sweep surfaces frequently to minimize the amount of potential contaminated material that may be spread during site work.
- Staff will decontaminate all equipment and gear as necessary during field events. Decontamination procedures will be strictly followed to prevent offsite spread of contaminated materials. Decontamination procedures should be detailed in the site-specific HASP but at a minimum will include cleaning equipment to a visually debris-free surface. The HSO/SS will assess the effectiveness of decontamination procedures by visual inspection.
- Hands must be thoroughly washed before leaving the Site to eat, drink, or use tobacco or cosmetics.
- Visual monitoring for fugitive dust and soil track-out by vehicles leaving the job site should be conducted by the HSO/SS or a dedicated member of the field staff. If visible dust leaving the work area or track-out are observed, immediate action should be taken to correct the issue.
- The HSO/SS will ensure the proper collection, packaging, and identification of waste materials so that waste materials will be properly disposed of.

7.0 Training Requirements

All Floyd|Snider field personnel must comply with applicable regulations specified in WAC Chapter 296-843, Hazardous Waste Operations, and WISHA (WAC Chapter 296-800). WISHA states that personnel who may come into contact with hazardous materials must have current HAZWOPER certification and participate in an employer-sponsored medical monitoring program. Therefore, these sections apply to any employee at Floyd|Snider who performs work where they have the potential to come in to contact with hazardous or dangerous substances. Additionally, when doing site work, at least one person on-site must be trained in CPR/First Aid. In order to maintain compliance with the regulation, **employees whose medical clearance or HAZWOPER certification are expired may not conduct field work unless their medical examination or refresher course is scheduled to occur within 30 days of their previous certification expiration date.**

7.1 MEDICAL MONITORING

In accordance with state medical surveillance regulations, field staff employees must participate in the medical monitoring program, which benefits both the employees and Floyd|Snider by evaluating the overall health of each individual in connection with the work to be performed, as well as monitoring workplace health and safety initiatives. Employees who will be working on-site are required to participate in a baseline examination and biennial examinations, as well as completion of an exit exam should an employee no longer conduct onsite work requiring medical monitoring.

The purpose of the Floyd|Snider examination program is to:

- Provide a baseline of health information for an employee, which can be used for comparison in related future examinations;
- Detect any adverse health effect that might be a result of workplace exposures;
- Detect any underlying medical condition that may place an employee at higher risk for medical problems related to workplace activities; and
- Ensure that an employee is able to function safely while performing their essential job functions at Floyd|Snider.

When an employee is no longer participating in fieldwork and wishes to unenroll from the Floyd|Snider medical monitoring program, the employee should contact the Health and Safety Administrator for approval and to begin the medical monitoring program exit process described in Section 7.5.

7.2 HAZWOPER TRAINING

HAZWOPER training and certification are required for all staff on-site at sites regulated by the Model Toxics Control Act (MTCA) or the USEPA more than 30 days per year. This training typically

includes an initial 40-hour HAZWOPER certification and annual 8-hour refresher courses. Field staff who have the potential to contact contaminated materials must have 40-hour HAZWOPER certification and attend annual 8-hour refresher courses. HAZWOPER certification may also be necessary on a project-specific basis for PMs who are not active in the field safety training and medical monitoring program. Field staff who do not have the potential to contact contaminated material, and are not in a supervisory field role, may require fewer hours of HAZWOPER training, to be determined on a case-by-case basis. These employees will also be required to attend annual 8-hour refresher courses.

7.3 JOB-SPECIFIC TRAINING

In addition to the 40-hour classroom training required by HAZWOPER, all field staff must complete 24 hours of job-specific training. This training is conducted on-site in the field under direct supervision of a skilled supervisor who is another Floyd|Snider employee. These training hours can occur on one or multiple field events and can cover an array of standard field activities. Once the 24-hours of training is complete, job-specific training forms (available on Floyd|Snider's Health and Safety department page on SharePoint) must be completed and signed by the trainer and submitted to the Health and Safety Administrator.

Additional site-specific training should be conducted to cover onsite hazards; PPE requirements, use, and limitations; decontamination procedures; and emergency response information as outlined in the HASP for the site.

7.4 CPR/FIRST AID

When conducting field work, at least one person on-site must be trained in CPR/First Aid, with a current certification. All employees who are on-site at MTCA- or USEPA-regulated sites more than 30 days per year are required to have current CPR/First Aid certification. This training is also provided by the company to any interested employees, including those who do not do field work.

7.5 EXITING THE FIELD STAFF SAFETY TRAINING AND MEDICAL MONITORING PROGRAM

This section presents the protocols to be followed in the event that an employee must exit the field staff safety training and medical monitoring program due to termination of their employment or transition to a different role at Floyd|Snider.

7.5.1 Termination of Employment

Washington's medical surveillance regulations require Floyd|Snider to schedule an exit exam for an employee upon termination of employment. Upon termination, employees will be notified of the appointment date and time and will be given information to reschedule the appointment if needed. The exit exam will be provided at Floyd|Snider's sole expense, and it is strongly recommended, in the best interest of your health, that you attend the appointment.

Floyd|Snider reserves the right to withhold payment of any severance package offered until confirmation of the exam is received.

7.5.2 Transition of Role

Floyd|Snider is a company of versatile employees with technical expertise who collaborate effectively to meet client and project needs; because of this collaborative approach, we do not employ full-time field technicians who exclusively fill a sampling role. Therefore, to ensure that client needs are met even during our busiest times and spread workload equitably across the firm, it is essential that all staff involved in field data collection, including in a supervisory capacity, maintain current field safety certification and medical clearance.

However, under certain limited circumstances, an employee may transition roles at the company such that field certifications are no longer needed. An employee who wishes to exit the field staff safety training and medical monitoring program must:

- Document that employee has performed fewer than 30 partial or full days of field work for each of the past 2 calendar years; and
- Obtain approval from the Management Committee, by coordinating with the Health and Safety Administrator.

If an employee's exit from the program is approved, the employee is required by WISHA to complete a medical monitoring exit exam. Failure to complete an exit exam may result in withholding any bonus pay and a delay in annual pay increases.

A letter to document the date and reason for an employee's rationale for terminating participation in the field staff safety training and medical monitoring program, signed by the employee and a Principal, must be maintained in the employee's personnel file.

8.0 Record Keeping and Reporting

Prompt and accurate recording and reporting is essential for continuing to improve the Floyd|Snider health and safety program and comply with the safety regulations.

8.1 RECORD KEEPING

Records should be kept of all employee training, safety meetings including Health and Safety Committee meetings and daily tailgate safety meetings conducted in the field, and near misses and incidents. Forms for on-the-job employee training, daily tailgate safety meetings, and near misses and incidents are available on the company's Health and Safety department page on SharePoint.

The minutes of Health and Safety Committee meetings are recorded by the Health and Safety Administrator and maintained on Floyd|Snider's Health and Safety department page on SharePoint.

The HSO/SS, or a designated alternate, will be responsible for conducting daily tailgate safety meetings and recording the meeting on a daily tailgate safety meeting form. The form, which must be appended to all HASPs, lists the hazards discussed and is signed by all personnel present at the meeting. The HSO/SS will manage the administration of job-specific training. Job-specific training forms must be completed and signed by the trainer.

Daily tailgate safety meeting and job-specific training forms must be reviewed with the PM after completion of the field event. After PM review, scans of the forms should be saved to the appropriate project folder, and the original copies of the forms will be submitted to the Health and Safety Administrator. The PM and the Health and Safety Administrator will determine whether any issues identified on tailgate safety meeting forms require further review or follow-up actions.

8.2 REPORTING

Near misses and incidents should be recorded on a Near Miss and Incident Reporting Form. The form gathers information regarding the circumstances of the near miss or incident, consequences, and corrective actions implemented. Near misses and incident report forms may be filled out by any Floyd|Snider staff. If a near miss or incident occurs in the field, the form must be reviewed and signed by the HSO/SS and the PM. This form must be appended to all site-specific HASPs.

Near Miss and Incident Reporting Forms will be maintained by the Health and Safety Administrator and made accessible to all staff for review after information that may identify specific individuals is redacted. In the event that an injury occurs in the workplace, the Health and Safety Administrator will coordinate with the PM or Management Committee to determine whether the injury is OSHA-reportable and implement follow-up reporting.

9.0 Signature Page

I have read this Accident Prevention Plan and understand its contents. I agree to abide by its provisions and will immediately notify the Health and Safety Administrator or Board of Directors if conditions or hazards not specifically designated herein are encountered.

Name (Print)	Signature	Date

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix C

Attachment C.2
Daily Tailgate Safety Meeting Form

DAILY TAILGATE SAFETY MEETING FORM

Instructions: To be completed by the Field Lead or Site Safety Officer (SSO) prior to beginning of work each day, when changes in work procedures occur, or when additional hazards are present. Review with your Project Manager (PM) at the conclusion of your event and file with your field notes.

PROJECT NAME AND SCOPE OF WORK:	**SITE ADDRESS FOR EMERGENCY RESPONDERS:**

EMERGENCY RESPONSE:

Muster Point:
Emergency Contacts & Resources:
Allergies/ Medical Alerts:

GENERAL TOPICS/HAZARDS: (Discuss all)

☐ Emergency Response Information	☐ Weather/Heat or Cold Stress
☐ HASP Review and Location	☐ Required PPE: Overview and Verification
☐ Near Miss & Incident Reporting	☐ Slip, Trip, Fall Hazards
☐ Safety Equipment Location: AED, First Aid Kit, & Fire Extinguisher	☐ Buddy System and Communication
☐ Chemicals of Concern & SDS locations	☐ Vehicle Safety, Road Conditions

DETAILS OF DISCUSSION

SITE SPECIFIC CONSIDERATIONS: (Discuss as applicable)

☐ Lessons Learned	☐ Construction	☐ Forested/Brush Environment
☐ Fatigue	☐ Heavy Equipment	☐ Insects/Animals
☐ Site Access & Security	☐ Overhead Hazards	☐ Water Hazards & Vessel Safety
☐ Establishing Work Zones	☐ Excavation/Trenching	☐ Decontamination
☐ Urban Environment	☐ Flammables/Sparks	☐ Mob/Demob
	☐ Tool Usage	☐ Other (Describe)

DETAILS OF DISCUSSION

ATTENDEE NAME/AFFILIATION/SIGNATURE:

SSO/Field Lead Signature & Date: _____

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix C

Attachment C.3
Near Miss and Incident Reporting Form

NEAR MISS AND INCIDENT REPORTING FORM

Date & Time:	**Project:**
Incident Type: □ **Near Miss** □**Incident**	**Site/Location:**
Check all that apply: □ **Injury/illness** □ **Vehicle/Equipment** □ **Workplace Violence** □ **Evacuation/Emergency** □ **Other Stop Work Hazard (describe: _____)**	

Employee(s) Involved (include witnesses, teaming partners, and subcontractors)**:**

Description of Incident (include precise location, injuries, the task performed, equipment/materials involved, 3rd party involvement, structure, or property damage)**:**

Describe Any First Aid or Medical Treatment:

What Was the Root Cause of the Incident Based on the 5 Whys Approach?

What were the Contributing Factors or Conditions during the incident? (weather, fatigue, low visibility, lighting, etc.)**:**

What actions can be taken to prevent the incident from reoccurring? (Include any preliminary actions taken):

Preparer's Signature:_____ Date:_____

SSO or Field Lead Signature:_____ Date:_____

Instructions:

- A Near Miss is a potential hazard or incident in which no property was damaged, and no personal injury was sustained, but where, given a slight shift in time or position, damage or injury could have easily occurred. An incident is when injuries or damage do occur and can range in severity.
- If there are multiple employees involved in an incident or near miss, select one to be the primary reporter.
- Complete the form as soon as practical after the incident with any witnesses or involved employees. A witness may complete the form on behalf of an injured employee if they cannot complete the form themselves.
- Fill out the forms completely. If a section does not apply mark the section as "N/A."

Field Near Miss/Incident

6. All Near Misses/Incidents in the field shall be reported to the Site Safety Officer or Field Lead.
   A. Serious field incidents (Injury, equipment damage, stop work etc.) are to be reported to the Project Manager (PM) as soon as it is safe to do so.
7. Complete the Near Miss and Incident Reporting form with the SSO/Field lead as soon as practical after the near miss/incident.
   A. The SSO/Field Lead will ensure any required reporting is made to the Client on the site.
8. Review the completed form with the PM at the end of the field work for the day.
9. Submit the final form to the Safety Program Manager after the PM review.

For incidents that result in injury, the SSO or PM will complete the Injury Reporting Follow-up Form within 24 hours and submit it to the Safety Program Manager.

Non-Field Near Misses/Incidents

1. Report the Near Miss or Incident to the Safety Program Manager or a Safety Committee Member.
2. Complete the Near Miss and Incident Reporting form as soon as practical after the incident with any witnesses or involved employees.
3. Review the completed form with the Safety Program Manager or a Safety Committee Member
4. For incidents that result in injury, the Safety Committee Member or Safety Program Manager will complete the Injury Reporting Follow-up Form within 24 hours.
5. Final versions of all forms should be submitted to the Safety Program Manager.

Follow-Up From an Incident

- For all near misses/incidents additional information (i.e., corrective action or medical updates) should be reported to the Safety Program Manager within 1 week.
- Notification of the event to the firm will be shared in a timely manner in the format most appropriate for the severity/complexity of the incident.
- Corrective action completion will be tracked and verified by the Safety Program Manager as applicable.
- Additional notifications to third parties (agencies, teaming partners, or clients) may be required by the PM or Principal-in-charge as appropriate.
- For vehicle incidents, notify Tiffany of the accident as insurance reporting may be required.
- Notify the Field Equipment Manager of any damage to equipment or vehicles.

INJURY REPORTING FOLLOW-UP FORM

Instructions for the Site Safety Officer or Project Manager:

- Complete this form following an incident with an injury within 24 hours of the incident.
- Submit this form with a copy of the completed Near Miss and Incident Reporting Form to the Safety Program Manager with copies to the Principal-in-Charge for the project if applicable.[1]
- Any additional information (i.e., corrective action or medical updates) should be reported to the Safety Program Manager within 1 week of the incident.

Was this an OSHA- Recordable Injury/Illness? Why?

□**Yes**	□ Loss of consciousness □ Days away from work □ Restricted work/Job transfer □ Medical Treatment Beyond First Aid[1] □ Other _____
□**No**	□First Aid treatment only □ Recordkeeping exemption □ No treatment □ Other _____

Describe Any Follow-Up First Aid or Medical Treatment:

Did the Injury/Illness involve Inpatient Hospitalization, Amputation or Loss of an Eye?
□No □Yes – Contact the Principal-in-Charge

What Was the Root Cause of the Incident Based on the 5 Whys Approach?

Follow-Up Actions Taken (include owners & dates)**:**

SSO or Field Lead Signature:_____ Date:_____

Project Manager's Signature: _____ Date:_____

[1] First Aid is defined as: using non-prescription medication at non-prescription strength, cleaning wounds on the skin surface, applying wound coverings (not sutures/staples), removing foreign bodies from the eye using irrigation or a swab, removing foreign bodies from elsewhere (not the eye) using tweezers, hot/cold therapy, drinking fluids to relieve heat stress, using finger guards or eye patches, using non-rigid means of support (such as bandages), using temporary immobilizing devices while transporting an injured person, administering tetanus immunizations. Guidelines for determining what incidents are OSHA Recordable are available here: *https://www.osha.gov/recordkeeping/*. The principal in charge is to be notified of any Recordable Incidents.

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix D
State Environmental Policy Act Checklist

A. Background

1. **Name of proposed project, if applicable:**

   Port of Vancouver Terminal 5 Alcoa Vancouver Site Interim Action Cleanup of Contaminated Sediments (the Project)

2. **Name of applicant:**

   Port of Vancouver USA

3. **Address and phone number of applicant and contact person:**

   Address: 3103 NW Lower River Road, Vancouver, Washington 98660

   Phone: (360) 693-3611

   Contact Person: Mary Mattix, Environmental Director/Project Manager

4. **Date checklist prepared:**

   May 2025

5. **Agency requesting checklist:**

   Washington Department of Ecology

6. **Proposed timing of schedule (including phasing, if applicable):**

   The Project is anticipated to occur in two phases to facilitate environmental compliance and project logistics: Phase 1 would occur in the upstream portion of Terminal 5 during the agency-approved in-water work window, which is anticipated to be from August 1 to January 31 each year, depending on agency approvals. Phase 1 is tentatively scheduled for the 2026 to 2027 in water work window, pending receipt of all permits and approvals, funding, and other project delivery considerations. Phase 2 would occur in the downstream portion of Terminal 5 during the subsequent in-water work window (2027 to 2028). Depending on economic, market, project delivery considerations, and/or agency coordination and approvals, work could occur during one in-water work window in either 2026 to 2027 or 2027 to 2028.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

   Terminal 5 is a key maritime asset of the port, providing deepwater moorage and upland infrastructure that has good connectivity to river, road, and rail transportation. The Project facilitates future maritime opportunities of Terminal 5.

   The port is currently marketing Terminal 5 as a bulk export facility. The port has secured federal, state, and local permits that can be utilized to construct in-water infrastructure that supports bulk export use.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Environmental information that has been prepared for the Project Site (but not for the purpose of this Project) is as follows:

- *Remedial Investigation/Feasibility Study, Alcoa/Evergreen Vancouver Site. Prepared for the Washington State Department of Ecology (on behalf of Alcoa, Inc.), prepared by Anchor Environmental, LLC (Anchor), September 2008.*
- *Final Cleanup Action Plan and Schedule (CAP), prepared by the Washington State Department of Ecology, December 2008.*
- *Sediment Characterization Report for Terminal 5 Berth 17, prepared by Floyd|Snider for Port of Vancouver, May 2019.*
- *Port of Vancouver Terminal 5 Berth 17 Sediment Sampling Results Memorandum, prepared by Floyd|Snider for Washington State Department of Ecology, October 2019.*
- *Final Periodic Review Data Report, Former Alcoa Vancouver Site, prepared for the Alcoa Corporation, prepared by Anchor QEA, January 2024.*

The following documents are being prepared as part of the Project and would be complete prior to completion of the Project:

- *Interim Action Work Plan for the Terminal 5 Former Alcoa Site, prepared by Floyd|Snider for the Port of Vancouver, March 2025.*
- *Engineering Design Report for the Terminal 5 Former Alcoa Site, prepared by Floyd|Snider for the Port of Vancouver, January 2026.*

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

There are no pending applications for governmental approvals of other proposals directly affecting the properties covered in this SEPA checklist. There are existing permits for development of in-water infrastructure to support a bulk export facility at Terminal 5, as mentioned above.

10. List any government approvals or permits that will be needed for your proposal, if known.

The proposed cleanup action would be conducted under an Agreed Order (AO) with Ecology. The proposed sampling that will be conducted as part of the Interim Action would be covered by existing programmatic authorizations held by the port.

Per WAC 173-340-710[9][b], remedial actions conducted under an AO are exempt from the procedural requirements of certain laws and all local and state permits but must comply with the substantive requirements of these laws and permits. The exemption from procedural requirements applies to the following relevant state and local regulations:

- Solid Waste Management Act (Chapter 70A.205 RCW)
- Hazardous Waste Management Act (Chapter 7A.300 RCW)

- Construction Projects in State Waters (Chapter 77.55 RCW)
- Water Pollution Control Act (Chapter 90.48 RCW)
- Shoreline Management Act (Chapter 90.58 RCW)
- Hydraulic Code Rules (Chapter 220-660 WAC)
- Any laws requiring or authorizing local government permits or approvals

The following federal permit and associated consultations would be secured:

- U.S. Army Corps of Engineers Nationwide Permit 38—Cleanup of Hazardous and Toxic Waste
    - Endangered Species Act (ESA) Section 7 Consultation
    - National Historic Preservation Act Section 106 Consultation

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Terminal 5 is located within the Alcoa Vancouver Model Toxics Control Act (MTCA) cleanup site, Cleanup Site ID No. 2867. Previous remedial activity included both uplands and in-water sediment cleanup actions (Figure 1). Terminal 5 sediments have not been dredged since completion of the cleanup activities in 2009 by Alcoa. Sampling conducted in 2018 and 2019 as part of an effort to bring Berth 17 into the port's Maintenance Dredging Program, identified remaining polychlorinated biphenyl (PCB) contamination and polycyclic aromatic hydrocarbon (PAH) contamination in the proposed dredge prism. Subsequent sediment sampling conducted by Alcoa in 2021 and 2022, to support the Washington State Department of Ecology's (Ecology's) 2020 periodic review process, and further sampling by the port, identified additional remaining PCB contamination and PAH contamination within the original 2009 cleanup action footprint. Ecology's 2020 periodic review document, informed by the 2018 through 2022 sampling results, is in process and is expected to be completed in 2025, prior to implementation of the Interim Action.

The 2009 cleanup of the Terminal 5 sediments failed to fully address the PCB and PAH sediment contamination present above the December 2008 CAP cleanup standards, and contaminated sediment remains throughout the cleanup boundary. Ecology has therefore determined that an Interim Action is necessary under WAC 173-340-430. The purpose of this Project is to implement a phased Interim Action to address contaminated sediments under a forthcoming Agreed Order (Order #XXXX) between the port and Ecology. The Interim Action may be executed in phases to support construction of the permitted bulk facility's in-water structures and bring Site sediments into compliance with the December 2008 CAP cleanup standards.

The following description provides the anticipated construction methods based on a preliminary concept plan. Completing this review early in the project design is consistent with

WAC 197-11-055(1), which directs the SEPA process to be integrated with agency activities at the earliest possible time to ensure that planning and decisions reflect environmental values.

During Phase 1, an estimated volume of approximately 20,000 cubic yards (CY) of sediment would be dredged upstream of the Berth 17 dock structure to the upstream end of the 2009 cleanup area boundary, with removal depths varying by location reaching approximately -60 feet Columbia River Datum (CRD) in some areas. During Phase 2, an estimated volume of approximately 20,000 CY of sediment would be dredged. Refer to Figure 2 for the Phase 1 and Phase 2 Interim Action Dredge Areas. A pre-design investigation is anticipated to be conducted in summer 2025 to inform remedial design, as well as refine the final dredge extents and dredge volumes.

Upon completion of each phase of dredging, post-dredge grab sampling would be conducted to verify the sediment cleanup criteria have been met. If the post-dredge surface-weighted average concentration (SWAC) for total PCBs exceeds 97 micrograms per kilogram (µg/kg; the sediment cleanup level in the CAP and 2009 Consent Decree), and/or any specific location exceeds Ecology's Sediment Management Standards (SMS) freshwater sediment cleanup objectives for either total PCBs or total PAHs, dredging would continue until both the post-dredge SWAC and all surface locations are in compliance.

During all dredging, dredge material would be placed on a watertight barge or scow and there would be no passive dewatering into the Columbia River. All monitoring will be conducted in accordance with an Ecology-approved Water Quality Monitoring and Protection Plan (WQMPP) that will be prepared as part of the Engineering Design Report (EDR) for the Interim Action. All dewatering water would be treated at the transload site in compliance with water quality standards and either discharged back to the Columbia River following treatment or discharged to the sanitary sewer, if needed. Dredge material is expected to be off-loaded at a port berth that supports this type of activity; however, in the past, a project contractor has performed maintenance dredging for the port and off-loaded dredged material at their yard for upland disposal. Consistent with the previous occurrence, the port and Contractor would coordinate with Ecology and any applicable agencies regarding off-loading of dredge material outside of the port berths. All material would be transported for disposal at a permitted landfill facility.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Terminal 5 property is located along the Columbia River at 5701 NW Old Lower River Road, River Mile 103, approximately 3 miles northwest of Vancouver, Washington (Figure 1). The port owns the Berth 17 pier and adjacent 208-acre upland parcels (Parcel Numbers 152799000, 152798000, and 152905000). The in-water portion of Terminal 5 that is subject to the Interim Action consists of multiple parcels owned by the Washington State Department of Natural Resources (DNR) and are managed under a Port Management Agreement (PMA;

Parcel Numbers 500501000, 503000000, 503001000, 500504000, and 503020000). One in-water parcel is owned by the Port (Parcel Number 503010000).

Terminal 5 is situated in the NW ¼ and NE ¼ of Section 19, Township 2N, Range 1E.

B. Environmental Elements

1. Earth

a. General description of the site:

Circle or highlight one: (Flat), rolling, hilly, steep slopes, mountainous, other:

Terminal 5 was designed to provide deepwater moorage, accommodating vessels from the adjacent federal navigation channel. Extending from ordinary high water mark along the shoreline at Terminal 5, the in-water portion of the site slopes down to approximately -50 feet CRD. The area between the face of Berth 17 dock and federal navigation channel is sloped at a lower gradient with depths ranging from approximately -35 feet CRD to -50 feet CRD—this area is intended to provide deepwater moorage.

b. What is the steepest slope on the site (approximate percent slope)?

The steepest existing slope is 3:1 and is located under the Berth 17 dock.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The substrate within the Terminal 5 sediment area consists of sand, silt, gravel, and native rock alluvial deposits.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

There are no known indications or history of naturally unstable soils in the vicinity of the Project. However, evaluation of the bathymetry surveys conducted by the port over the past decade has shown areas upstream and within the berth that have experienced continued erosion and lowering of the mudline. Additionally, a documented slope failure, attributed to Alcoa's cleanup activities, occurred over 15 years ago adjacent to the upriver side of the Berth 17 dock.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Please refer to the response to Question A.11, which provides additional detail regarding the purpose, location, and approximate extents of the proposed dredging. No filling is proposed as part of this project; however, the potential for placement of up to 2,000 CY of sand as a BMP for dredge residual management will be evaluated in the EDR, based on the design dredge extents and feasibility if deeper subsurface contamination is

encountered. Although the project proposes dredging and removal of contaminated sediments, if there are dredging constraints next to the Berth 17 structure, an armored cap consisting of up to 4,000 CY of sand and armored rock may be necessary.

The dredging quantities estimated for the Project based on the current information available are provided below; these will be updated as additional data are collected in coordination with Ecology:

- For Phase 1, an estimated volume of approximately 20,000 CY of sediment would be dredged from upstream of the Berth 17 dock structure to the upstream end of the 2009 cleanup area boundary, with the removal down to a maximum elevation of approximately -60 feet CRD in some locations.
- For Phase 2, an additional an estimated volume of approximately 20,000 CY of sediment would be dredged from the downstream end of the Phase 1 footprint to approximately 300 feet downstream of the Berth 17 dock structure, also down to a maximum elevation of -60 feet CRD.

The majority of the mudline within the Terminal 5 navigable area is already at or deeper than -43 feet CRD, the authorized navigational channel. Therefore, the proposed Interim Action remedial dredging would be going below this authorized depth and deeper than what is needed for operational use and/or outside of navigable areas (i.e., shoreward of the face of a terminal/dock structure) solely for the purpose of removing contamination. The cleanup dredging will not be based on operational or maintenance dredging needs.

f. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Erosion is not anticipated, as no clearing, grading, or upland construction activities are proposed other than transloading of dredged material.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Project activities would occur in water. The Project does not involve the addition of any impervious surfaces. The site conditions would remain unchanged in terms of impervious surface coverage following completion of the Project.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any.

The Project would not disturb upland soil. To minimize and control potential erosion during dredging activities, BMPs would be implemented as described below in response to Question 6.c.4.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

The primary emissions associated with the Project are related to construction equipment, support vessels (e.g., tugs, skiffs), and other equipment used during dredging activities,

including trucks. Emissions of this kind are typical for an industrial area, such as a working port. The emissions would be temporary in nature because the dredging activities are limited to a short-term project duration. The anticipated increase in emissions during dredging would best be described as negligible.

No significant ongoing emissions are anticipated, as the Project does not involve permanent equipment or facilities that produce air emissions.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no known off-site sources of emissions or odors that would affect the Project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any.

The contractor would be required to maintain all equipment in good working order to minimize emissions. The port would also require contractors to minimize unnecessary idling during operations. Emissions associated with the Project would be temporary and limited in nature and are not expected to significantly affect air quality.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes, the project would require work in and adjacent to the Columbia River.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Dredging would occur in, over, and within 200 feet of the Columbia River.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill placement is currently proposed as part of the Project. The Project would involve the removal of an estimated volume of approximately 40,000 CY of contaminated sediment from the in-water portion of Terminal 5, as shown on Figure 2.

4) Will the proposal require surface water withdrawals or diversions? Give a general description, purpose, and approximate quantities if known.

The Project would not require surface water withdrawals or diversions.

5) **Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.**

The Project would occur within and adjacent to the Columbia River, which is identified as a floodway by the Federal Emergency Management Agency, Flood Insurance Rate Map, effective September 5, 2012 (Map number 53011C0342D).

6) **Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.**

The Project does not involve direct discharges of waste materials to surface waters. All dredged material would be placed on a watertight barge or scow to prevent passive dewatering and all dredge return water would be treated before being discharged back to the Columbia River.

b. Ground:

1) **Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give a general description, purpose, and approximate quantities if known.**

The Project would not include groundwater withdrawal for drinking or other purposes.

2) **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (domestic sewage; industrial, containing the following chemicals…; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.**

The Project would not include discharge of waste material into the ground from septic tanks or other sources.

c. Water Runoff (including stormwater):

1) **Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.**

During dredging operations, stormwater from the deck of barges and scows would be contained along with dredge material, with no passive dewatering into the Columbia. At the transload site, this commingled stormwater and dewatering water would be treated prior to discharge to the Columbia River in compliance with water quality standards or directed to the sanitary sewer system if required.

Any stormwater at the onshore transload and material handling areas would be managed per site-specific stormwater pollution prevention measures.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Waste materials would not enter the ground or surface waters during the Project. Given that the Project is located in the Columbia River, there is the potential for debris to inadvertently enter surface water during work activities. Additionally, there is also potential for leaks and spills of fuel, hydraulic fluids, and lubricants from standard construction-related equipment and storage containers. Furthermore, all dredge return water would be treated before being discharged back to the Columbia River. The BMPs the Contractor would be required to implement to ensure that waste materials, including contaminated water, do not enter surface water are listed below in the response to Question 3.c.4.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The Project would not alter or affect drainage patterns in the vicinity of the site.

4) Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any.

The following water quality protection measures will be implemented throughout the Project:

- All in-water work will occur during the agency-approved in-water work window anticipated to be from August 1 to January 31 each year.
- The Contractor will develop a Dredging Plan; Spill Prevention, Control, and Countermeasure Plan (SPCC); and other relevant plans, subject to approval by the regulatory agencies before construction begins.
- Turbidity will be monitored to ensure that construction activities are in compliance with Washington State Water Quality Standards for Surface Waters (WAC 173-201A). All monitoring will be conducted in accordance with an Ecology-approved WQMPP.
- A suite of BMPs will be employed to minimize sediment loss and turbidity generation during dredging and dewatering including, but not limited to, the following:
    - Elimination of multiple bites while the bucket is on the bottom
    - No stockpiling of dredge material below the ordinary high-water line
    - No riverbed leveling
    - Use of spill plates during transloading
- Depending on the results of the water quality monitoring program, enhanced BMPs may also be implemented to further control turbidity. Enhanced BMPs may include the following:
    - Slowing the velocity (i.e., cycle time) of the ascending, loaded clamshell bucket through the water column.

    - Pausing the dredge bucket near the bottom while descending and near the water line while ascending.
- The barge will be managed such that the dredged sediment load does not exceed the capacity of the barge. The load will be placed in the barge to maintain an even keel and avoid listing.
- Dredge material will be placed on a watertight barge or scow and there will be no passive dewatering into the Columbia River. All dewatering water will be treated at the transload site and either discharged back to the Columbia River or discharged to the sanitary sewer, if acceptable.
- Dredge vessel personnel will be trained in hazardous material handling, and spill response and will be equipped with appropriate response tools, including absorbent oil booms. If a spill occurs, spill cleanup and containment efforts will begin immediately and will take precedence over normal work; appropriate spill notifications will occur per the conditions of the project permits and contract.
- Fuel hoses, oil or fuel transfer valves, and fittings will be inspected on a regular basis for drips or leaks in order to prevent spills into the surface water.
- The Contractor will monitor spillage during transfer operations.
- There shall be no path for material to fall into the water during off-loading operations. Spill aprons or other containment devices shall be used to prevent the release of spilled material into the water between the barge and the dock.
- To verify that no material is released, visual water quality monitoring will be conducted around the barge during removal and transfer operations. Additional follow-up measures will be implemented, if needed.
- If stockpiling of dredge material becomes necessary, BMPs will be employed as appropriate to control runoff and erosion. Such BMPs may include the following:
    - Installing silt fences, hay bales, and/or containment berms to present runoff of accumulated water to the Columbia River
- Routinely inspecting the stockpile areas to ensure that BMPs are functioning properly.

4. Plants

a. Check the types of vegetation found on the site:

☐ **deciduous tree: alder, maple, aspen, other**

☐ **evergreen tree: fir, cedar, pine, other**

☐ **shrubs**

☒ **grass**

☐ **pasture**

☐ **crop or grain**

☐ **orchards, vineyards, or other permanent crops**

☐ **wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other**

☐ **water plants: water lily, eelgrass, milfoil, other**

☒ **other types of vegetation**

Little to no aquatic vegetation exists within the Terminal 5 sediments and upland vegetation is sparse (consisting of blackberry and grass) along the shoreline and within the adjacent Terminal 5 area.

b. What kind and amount of vegetation will be removed or altered?

No vegetation would be removed or altered as a result of the Project.

c. List threatened and endangered species known to be on or near the site.

There are no threatened or endangered plant species known to be on or near the site. The Washington Natural Heritage Information System lists several plant species for Clark County, with one recorded as occurring within the floodplain of the lower Columbia River. However, the potential for this water howellia (*Howellia aquatilis*) to occur within the project site is considered very low because the species requires clay and organic soils, semipermanent water, and overhanging deciduous trees, which are not characteristics of the area surrounding Terminal 5.

Further, the Project would not disturb plant species because construction activities occur in water.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

No landscaping is proposed as part of the Project, and measures to preserve or enhance vegetation on the site are not proposed either, because the Project would not have an effect on plant species.

e. List all noxious weeds and invasive species known to be on or near the site.

The invasive Himalayan blackberry (*Rubus armeniacus*), false indigo, and invasive grass species exist throughout the lower Columbia River.

5. Animals

a. List any birds and other animals that have been observed on or near the site or are known to be on or near the site.

Examples include:

- **Birds: hawk, heron, eagle, songbirds, other:**

- **Mammals: deer, bear, elk, beaver, other:**
- **Fish: bass, salmon, trout, herring, shellfish, other:**

Birds: Washington Department of Fish and Wildlife's (WDFW's) Priority Habitat and Species on the Web identifies most of Parcel 3 (to the northwest of Terminal 5) and lands north of the flushing channel as part of the "Ridgefield Lowlands," which support wintering concentrations of Canada geese (*Branta canadensis*), sandhill cranes (*Grus canadensis*), tundra swans (*Cygnus columbianus*), white fronted geese (*Anser albifrons*), dabbling ducks (*Anatinae*), and nesting ducks. Parts of Parcel 3 and lands north of the flushing channel are also part of the "Vancouver Shillapoo Lake AG lands," which includes winter waterfowl habitat and is heavily used by geese populations such as Taverner's, lesser, dusky, and cackling Canada geese; mallard; wigeon; and pintail. Other bird species known to occur in the general area of the port's properties are pigeons, songbirds (robins, swallows, starlings, and sparrows), bald eagle (*Haliateetus leucocephalus*), heron, owls, hawks, egrets, and osprey. Streaked horned lark (*Eremophila alpestris strigata*) have previously been documented at the Parcel 3 dredge placement site (further detailed under Section 5.b. below).

Mammals: Mammal species known to occur in the general upland areas include those common to urban environments, such as small rodents, raccoons, coyotes, feral cats, and deer. Beavers, sea lions, and otters are known to occupy the Columbia River.

Fish: The Columbia River is known to support numerous species of fish, including salmon and trout. WDFW's Priority Habitats and Species on the Web identifies the following fish species associated with occurrence or migratory patterns within the lower Columbia River: fall chinook (*Oncorhynchus tshawytscha*), pink salmon (*Oncorhynchus gorbuscha*), coho salmon (*Oncorhynchus kisutch*), winter steelhead (*Oncorhynchus mykiss*), fall chum (*Oncorhynchus keta*), sockeye (*Oncorhynchus nerka*), white sturgeon (*Acipenser transmontanus*), summer chinook (*Oncorhynchus tshawytscha*), green sturgeon (*Acipenser medirostris*), summer steelhead (*Oncorhynchus mykiss*), resident coastal cutthroat (*Oncorhynchus clarki*), spring chinook (*Oncorhynchus tshawytscha*), and Dolly Varden/bull trout (*Salvelinus malma/S. confluentus*).

b. List any threatened and endangered species known to be on or near the site.

The following threatened and endangered species, or evolutionarily significant units (ESUs) and their distinct population segments (DPS), exist within the Columbia River near Terminal 5. Consultation occurred under Section 7 of the ESA to bring Berth 17 into the port's dredging program. Potential effects to these species from the in-water work proposed under this Project is consistent with the affected species described in the Biological Opinions issued by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (WCRO-2024-10762) and U.S. Fish and Wildlife Service (USFWS; 01EWFW00-2017-F-1273-R001).

- **Chinook salmon (*Oncorhynchus tshawytscha*):** Lower Columbia River ESU, Upper Willamette River ESU, Upper Columbia River spring-run ESU, Snake River spring/summer-run ESU, Snake River fall-run ESU

- **Chum salmon (*Oncorhynchus keta*):** Columbia River ESU
- **Coho salmon (*Oncorhynchus kisutch*):** Lower Columbia River ESU
- **Sockeye salmon (*Oncorhynchus nerka*)**: Snake River ESU
- **Steelhead (*Oncorhynchus mykiss*):** Lower Columbia River ESU, Middle Columbia River ESU, Upper Columbia River ESU, Snake River Basin ESU
- **Eulachon (*Thaleichthys pacificus*):** Southern DPS of Pacific eulachon
- **Bull trout (*Salvelinus confluentus*):** Columbia River DPS

Streaked horned larks have been documented at the port's nearby Parcel 3 dredge deposit site that is located downriver approximately 1.5 miles. However, they have not been noted in surveys since 2016, and streaked horned larks have not been documented at Terminal 5. Streaked horned lark critical habitat includes several specifically identified sandy dredge deposit locations in and adjacent to the Lower Columbia River, but critical habitat is not documented within port facilities or Clark County. The nearest designated critical habitat is downstream of the port, near Kalama, Washington.

The following are other special status species that may occur within or near the port. These special status species may include species protected by other federal regulations (e.g., the Marine Mammal Protection Act, MBTA, or Bald and Golden Eagle Protection Act), state-listed endangered or threatened species, or other sensitive species:

- Steller sea lion (Eastern DPS) (*Eumetopias jubatus*)
- Sandhill crane (*Grus canadensis*): WDFW has mapped migratory occurrence locations of sandhill cranes on agricultural land west of the site at the port's Parcel 3 and areas north of the Flushing Channel known as Cranes' Landing. A berm has been constructed on Parcel 3 to provide a buffer for sandhill crane habitat north of the flushing channel.
- Bald eagle (*Haliaeetus leucocephalus*): No eagle nests were observed during the August 2021 bird surveys conducted at the project site.
- Western pond turtle (*Actinemys marmorata*): Western pond turtles (also known as Pacific pond turtles) have not been documented as occurring in the vicinity of the port but have been documented in Clark County and have the potential to occur in the port area.
- Osprey (*Pandion haliaetus*): Osprey were observed during the August 2021 bird surveys conducted at the Project site.
- Pacific lamprey (*Entosphenus tridentatus*)
- Other migratory birds

The Eastern DPS of Steller sea lion was delisted from the endangered species list on November 4, 2013. Prior to delisting, it was a federally threatened species under the ESA. Steller sea lions are still listed as threatened by the State of Washington.

Sandhill cranes are listed by the State as endangered but are not federally listed under the ESA. Sandhill cranes are known to occur in the vicinity of the port in the Vancouver Lake Lowlands (Lowlands). WDFW has mapped migratory occurrence locations of sandhill cranes on agricultural land west of the site. Fall migration of cranes in the Lowlands typically occurs in late September and early to mid-October. Spring migration through the Lowlands generally occurs from mid-March to mid-April. The Lowlands are used as stopover habitat during migration and for foraging by overwintering birds. Cranes are known to rest and feed on Parcel 3 but more commonly use the land north of the flushing channel known as Cranes' Landing, which is managed to provide wintering food for migrating and staging flocks of sandhill cranes, as well as other geese, ducks, raptors, and mammalian species, by Columbia Land Trust. A berm has been constructed on Parcel 3 to provide a buffer for sandhill crane habitat.

The bald eagle is currently a species of concern (federal) and state-listed sensitive. Bald eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act and are listed by the State as sensitive. The USFWS National Bald Eagle Management Guidelines recommend that potentially disturbing activities occur outside a 660-foot protective buffer around an active nest during the nesting season, which generally occurs January to August. No eagle nests were observed during the August 2021 bird surveys conducted at the project site.

Western pond turtle is a State-listed endangered species. Western pond turtles have not been documented as occurring in the vicinity of the port but have been documented in Clark County and have the potential to occur in the port area. Potentially suitable habitat would include emergent wetland habitats in the vicinity of Vancouver Lake.

Ospreys are not listed in ESA or by the State but are considered a State-monitored species.

There are numerous other species that are listed and have known occurrences or historical ranges in Washington but are not likely to occur on or near the port. Examples include the northern spotted owl (*Strix occidentalis caurina*), Oregon spotted frog (*Rana pretiosa*), yellow-billed cuckoo (*Coccyzus americanus*), marbled murrelet (*Brachyramphus marmoratus*), gray wolf (*Canis lupus*), and Columbian white-tailed deer (*Odocoileus virginianus leucurus*). USFWS listed the Taylor's checkerspot butterfly (*Euphydryas editha taylori*) as threatened and also designated critical habitat for the species. There is no critical habitat designated for this species on or near the port.

c. Is the site part of a migration route? If so, explain.

The general area of the site is within the Pacific Flyway, a broad migratory corridor that extends from Alaska to Central America and is used by waterfowl, eagles, hawks, falcons, songbirds, sandhill cranes, and shorebirds (Management Recommendations for Washington's Priority Species, Volume IV: Birds [WDFW 2024]). The Columbia River serves as a migration corridor for salmonids.

d. Proposed measures to preserve or enhance wildlife, if any.

The response to Question B.3.c.4 lists BMPs that would be implemented to avoid or minimize potential impacts fish and wildlife.

e. List any invasive animal species known to be on or near the site.

Two animal species from Washington's comprehensive list of invasive animals, plants, microorganisms, or pathogens have been observed within the lower Columbia River, although no sightings have occurred within the project area. These include the bullfrog (*Rana catesbeiana*) and the nutria (*Myocastor coypus*).

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

There would be no change in energy to meet the completed Project's energy needs.

During dredging, the primary energy needs of the Project would be related to construction equipment, as well as support vessels/vehicles and other equipment (i.e., tugs, skiffs, land-based equipment).

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The Project would not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any.

Construction equipment operating upland would be required to follow the port's anti-idling policy, limiting unnecessary idling during port-contracted program activities.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur because of this proposal? If so, describe.

Please see the responses to questions B.7.a.1 through 5 for detail regarding potential environmental health hazards that could potentially occur as a result of the Project, as well as BMPs to minimize potential occurrences and potential related impacts.

1) Describe any known or possible contamination at the site from present or past uses.

The upland parcels adjacent to Berth 17 were historically operated as an aluminum smelter and series of aluminum fabrication plants. The dock was used as an unloading facility for alumina shipped to Vancouver from South America. The crane and conveyor were used to unload vessels and transport the alumina to storage silos, all of which are no longer present. A variety of materials and potential contaminants were handled at the property during historical operations that contributed to soil, groundwater, and sediment contamination. The port was not an owner of Terminal 5

when contamination occurred. In order to fulfill the requirements of a Consent Decree with Ecology to address this contamination, Alcoa performed numerous cleanups at the site in both the uplands and sediments.

Between October 2008 and April 2009, a sediment cleanup was performed by Alcoa that involved dredging of 49,990 CY of PCB-contaminated sediment along the shoreline and placement of 34,305 CY of enhanced natural recovery (ENR) sand (Anchor QEA 2009). Process residue (i.e., tar), iron slag, asbestos, and miscellaneous debris were also removed from the shoreline to the east and west of the Berth 17 dock. Upon removal of this contamination, these areas of the shoreline were covered with revetment riprap supplement.

PCBs were the driver for the sediment cleanup, which included dredging sediment with PCB concentrations greater than the remedial action level (RAL) of 320 µg/kg and ENR of sediment with PCB concentrations less than the RAL and greater than the cleanup level (CUL) of 97 µg/kg. Performance sampling of the ENR sand was conducted after placement.

In the uplands, various remedial actions occurred on the upland property between March 2008 and June 2009, including the decontamination of abandoned fuel underground storage tanks, excavation of contaminated soil, transformer remediation, and removal or capping of fluoride-enriched alumina ore and coal tar pitch.

Port-Led Sediment Sampling

In 2018, the port initiated efforts to incorporate Berth 17 into its existing maintenance dredging program to maintain operable berth depths and obtain a suitability determination from the Portland Sediment Evaluation Team (PSET) for the future maintenance dredged material. The results identified elevated PCBs (relative to SMS) within the proposed dredge prism (and 2009 cleanup action footprint) and localized PAH contamination. In July 2019, the port conducted additional sediment samples within Berth 17, as well as upriver and down river, to understand sediment conditions relative to potential future operational use. Consistent with the 2018 data, the results indicated that elevated concentrations of PCBs are present in surface sediment and shallow subsurface sediments directly waterward of the Berth 17 dock and directly up river.

In June and July 2021 (concurrent with 5-year periodic review activities described below) the port also collected samples pre- and post-fender pile replacement along the pier-face of Berth 17 to document surface and shallow subsurface conditions prior to fender pile replacement. Similar to the 2018 and 2019 data, the results indicated that elevated concentrations of PCBs are present in surface sediment and shallow subsurface sediments adjacent to the dock.

Alcoa-Led Sediment Sampling (as part of Periodic Review)

Because of the contamination identified above, Ecology requested additional data to support their upcoming 2020 periodic review. Between 2021 and 2022 Alcoa

collected sediment samples within the Terminal 5 berth area. Results were consistent with those identified by the port. A final data report was submitted in January 2024 that summarizes the contamination still present within the sediments.

Summary of Contamination

Total PCB Aroclor concentrations in surface sediment range from 2.2 to 4,600 µg/kg, with 21 collected samples exceeding the SMS benthic freshwater Sediment Cleanup Objective (SCO) of 110 µg/kg. In subsurface sediment, PCB Aroclor concentrations ranged from 11 to 18,000 µg/kg. Of the 89 samples analyzed 38 samples from 15 locations exceed the SMS benthic freshwater SCO of 110 µg/kg.

Total PAH concentrations in surface sediment range from 2.3 to 63,000 µg/kg, with four samples exceeding the SMS benthic freshwater SCO of 17,000 µg/kg. Total PAH concentrations in subsurface sediment samples collected range from 5.8 to 110,000 µg/kg. Of the 49 samples analyzed, 5 samples exceed the SMS benthic freshwater SCO of 17,000 µg/kg.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

The known potential hazardous chemicals that might affect the Project are sediment concentrations of PCBs and PAHs located Terminal 5 sediment area, as described in the response to Question B.7.a.1.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Gas, oil, and grease required for standard construction equipment would be used. The Contractor would be required to prepare an SPCC Plan to identify procedures to avoid, minimize, and, if necessary, respond to any such releases. Toxic or hazardous chemicals are not expected to be stored or used on site after project construction.

4) Describe special emergency services that might be required.

Safety protocols would be developed by the Contractor prior to dredging to reduce the need for emergency medical services at the site.

5) Proposed measures to reduce or control environmental health hazards, if any.

To prevent impacts resulting from an unintentional release of fuel, lubricants, or other hazardous materials, the Contractor will prepare an SPCC Plan to be used for the duration of the project activities.

- The SPCC Plan will identify construction planning elements and recognize potential spill sources at the site. The SPCC Plan will outline responsive actions in the event of a spill or release and will identify notification and reporting

procedures. The SPCC Plan will also outline Contractor management elements such as personnel responsibilities, project site security, site inspections, and training.

- The SPCC Plan will outline the measures taken by the Contractor to prevent the release or spread of hazardous materials, either found on-site and encountered during construction but not identified in contract documents, or any hazardous materials that the contractor uses on the construction site during construction activities. These items include, but are not limited to, gasoline, oils, and grease.
- The Contractor will maintain, at the job site, the applicable equipment and material designated in the SPCC Plan, as well as personnel trained in its use.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

The port is a working waterfront and an active industrial area, with zoning that allows for noise-generating activities. The noise associated with standard operations at the port would not affect the Project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise from the dredging and material placement would be short term. Long-term noise would not be generated by the Project. The dredge equipment and other construction equipment would operate at a similar volume to other industrial activities that occur on port-owned property, and the work is most likely to occur during standard working hours but could occur at night if required. Regardless, the noise generated would remain below the maximum permissible noise levels provided in WAC 173-60-040 and would remain in full compliance with the noise levels outlined in these regulations.

3) Proposed measures to reduce or control noise impacts, if any.

No additional measures are proposed to reduce or control noise impacts, as noise effects are not anticipated.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Terminal 5 is currently used as a cargo laydown area and rail corridor. NGL Supply Terminal Company leases a portion of Terminal 5 for propane truck loading and unloading off railcar. CalPortland leases a portion of Terminal 5 for sand and gravel laydown. The Berth 17 dock, which supports a nested vessel configuration, is currently being

temporarily leased by a Maritime Administration (MARAD) naval vessel. The tidelands associated with the Project are owned by DNR and are managed under a PMA.

The properties directly adjacent to Terminal 5 consist of industrial and commercial businesses. Directly to the east is Clark County Jail Work Center, an 18.3-acre minimum security facility for low-risk inmates. To the west of Terminal 5 is Tidewater Barge Lines. Tidewater Barge Lines handles and transports freight such as grain, wood products, fertilizers, and garbage. Numerous barges are moored at the facility for transport of goods. Directly adjacent to the north of Terminal 5 is CPU River Road Generation Plant (and their associated outfall and DNR lease).

These properties would not be affected by the Project.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

There is no known history of agricultural use at Terminal 5; the Project area is an aquatic environment.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?

The Project would not affect nor be affected by surrounding working farm or forest land normal business operations.

c. Describe any structures on the site.

Within Terminal 5, is the Berth 17 dock, an approximately 425-foot dock constructed in 1967 with a concrete superstructure supported on prestressed concrete piling. The dock is in good condition. A new fender system and mooring dolphins, pedestrian access catwalks, and vehicular access causeway support the dock and provide access.

d. Will any structures be demolished? If so, what?

No structures would be demolished as part of the Project.

e. What is the current zoning classification of the site?

The current zoning classification for the Terminal 5 in-water area is water.

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation for the Terminal 5 in-water area is water.

g. If applicable, what is the current shoreline master program designation of the site?

The areas above the ordinary high-water mark on the site are designated as Urban: High Intensity in the City of Vancouver Shoreline Master Program, effective September 24, 2012. Additionally, the Shoreline Master Program designates the Columbia River and Vancouver Lake as shorelines of statewide significance and are designated Aquatic.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The entire City of Vancouver, because of its location above the Troutdale Aquifer, is within a critical aquifer recharge area as defined in VMC 14.26.115, and has been designated as a sole source aquifer by the U.S. Environmental Protection Agency. However, the project site and the new project components are not within 1,900 feet of a municipal water well supply and are therefore not subject to the special protection area provisions of VMC 14.26, Water Resources Protection. Additionally, the Project would not disturb existing critical habitat or riparian buffers located adjacent to the area being dredged.

i. Approximately how many people would reside or work in the completed project?

The Project does not support housing or employment.

j. Approximately how many people would the completed project displace?

The Project would not result in the displacement of people.

k. Proposed measures to avoid or reduce displacement impacts, if any.

Measures to avoid or reduce displacement impacts are not proposed.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any.

The Project would not change the existing and projected land use at the site or at the port; rather, it would remediate known sediment contamination at Terminal 5 that could restrict potential future uses if not addressed.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any.

The Project would not result in direct or indirect impacts to nearby agricultural and forest lands. Further, there are no agricultural or forest lands of long-term commercial significance in the City of Vancouver.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

No housing units would be provided as part of the Project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing units would be eliminated as part of the Project.

c. Proposed measures to reduce or control housing impacts, if any.

No measures are proposed as the Project would not provide or eliminate housing.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No new structures are proposed as part of the Project.

b. What views in the immediate vicinity would be altered or obstructed?

The Project would not alter or obstruct views in the immediate vicinity. The equipment associated with dredging is consistent with a working port facility and the industrial and commercial use of the Columbia River.

c. Proposed measures to reduce or control aesthetic impacts, if any.

The Project would not result in short-term or permanent aesthetic impacts; therefore, no measures to reduce or control aesthetic impacts are proposed.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Light and glare associated with the Project would be limited to temporary and short-term impacts and would be generated by dredging equipment, support vessels, and trucks during construction. It is anticipated that most work would occur during a 10-hour workday, from 7:00 a.m. to 5:00 p.m.; thus, lighting requirements should be minimal and typically used during the beginning and ending of the standard daily shifts when natural light levels are lower. However, if work extends into nighttime hours, the light or glare associated with project construction is expected to be within the ambient light levels of an operational industrial facility and would be directed toward work areas to minimize glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No, the Project would not produce light or glare.

c. What existing off-site sources of light or glare may affect your proposal?

Off-site sources of light or glare would not affect the Project.

d. Proposed measures to reduce or control light and glare impacts, if any.

The Project would not result in impacts from light or glare; therefore, no measures to reduce or control light and glare are proposed.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The lower Columbia River is used for waterborne recreation such as boating, kayaking, wind surfing, and fishing. Shoreline access is available at several informal and established scenic viewpoints and parks, such as Blurock Landing, located approximately 1.7 miles downriver of the Project site.

Vancouver Lake and the neighboring Vancouver Lake Regional Park are used for a variety of passive and active recreational opportunities, including picnicking, birdwatching, fishing, swimming, windsurfing, and kayaking.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The Project would not displace any existing recreational uses. Dredging would occur by barge, but this vessel traffic is consistent with other commercial vessel traffic that exists along the lower Columbia River.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any.

The Project would not result in recreational impacts; therefore, no measures to reduce or control recreational impacts are proposed.

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

The Project would not have any direct impact to structures.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

The banks of the Lower Columbia River are known to have been used by Native Americans for temporary fishing camps prior to European settlement. The Project area has been classified by the City of Vancouver as Level A High Probability for archaeological resources. Since the early 1970s, numerous archaeological investigations have been conducted in the project vicinity, with involvement of the Confederated Tribes of the

Grand Ronde, Chinook Tribe, Cowlitz Tribe, Confederated Tribes of Siletz, Shalwater Bay Tribe, and the Yakama Nation.

The Project is located within areas that have been previously dredged and sampled without encountering cultural resources. The Project would focus on accumulated deposits of river sediment. Therefore, the risk of disturbing cultural resources is low.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

As part of the evaluation of potential cultural resources in the area, the following databases were queried: the National Register of Historic Places, the Washington State Department of Archaeology and Historic Preservation's Washington Information System for Architectural and Archaeological Records Data, and the Clark County database of historic sites.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

As part of the process to secure federal permits for the Project, consultation would be initiated with potentially affected Tribes and with the Department of Archaeology and Historic Preservation (DAHP). This opportunity for consultation would allow the Tribes and DAHP to propose measures to avoid, minimize, or compensate for loss of, changes to, and disturbance to resources.

As required by WAC-173-340-515, an Inadvertent Discovery Plan (IDP) is being prepared as part of the Interim Action Work Plan. The Project would be conducted in accordance with the RCW 27.53.060 (Archaeological Sites and Resources) and RCW 27.44.020 (Indian Graves and Records) and all applicable DAHP regulations. If any unknown archaeological or historical materials are encountered during project activities, work in the immediate area of the discovery would be halted and the following actions taken per the IDP: 1) implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering, 2) notify all appropriate parties, 3) take reasonable steps to ensure the confidentiality of the discovery site, and 4) take reasonable steps to restrict access to the site of discovery.

Should a discovery occur, a professional archaeologist would be called in to assess the significance of the find, and DAHP and concerned tribes would be notified so that a course of action could be implemented.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The Project would not result in changes to access and use of the existing street system. The primary roadway serving the port is State Route 501. Several roads stem from

State Route 501 and run internal to the port property, including NW Old Lower River Road, NW Gateway Avenue, W 26th Avenue, St. Francis Lane, and Thompson Avenue. Access to and egress from the port has not changed since the previous environmental reviews.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

C-TRAN's "The Current" is an on-demand rideshare service that provides point-to-point bookable rides throughout the Vancouver area. One of the service zones includes service to the Port of Vancouver and surrounding industrial area, west of the Vancouver rail yard and train station. The nearest C-TRAN bus stop for fixed route service is as follows:

- The nearest transit stop is approximately 0.5 to 1 mile from the port, on Fruit Valley Road. The stop is served by C-TRAN Bus Route 6: Fruit Valley/Grand.

c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle, or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The Project does not require any new or improved roadways or other transportation improvements.

d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The Project area is in the immediate vicinity of water and rail transportation, as the port is located on the lower Columbia River and is served by BNSF Railway and Union Pacific Railroad.

Dredging and associated construction equipment would be transported to the site via the Columbia River. Equipment would operate at the designated dredging locations within Terminal 5. Dredged material would be placed on a watertight barge or scow and transported downstream for offloading at Berth 4, Berth 9, Berth 10, Berths 13/14, or Berth 17. All dredged material would then be transported by truck for disposal at a permitted landfill facility.

e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

No additional vehicular trips are expected to be generated by the completed project.

Vehicle trips associated with the Project would be temporary and primarily related to dredging activities. After dredged material is offloaded at the relevant berth location, it would be loaded into trucks for transport to a permitted landfill facility. Although it is anticipated that transport to the landfill would occur via truck, material could be loaded onto a barge and transloaded to a landfill. Based on the upper dredging estimate of

40,000 CY and a standard dump truck capacity of 10 CY, an estimated 4,000 truck trips would be required to transport contaminated sediment. This would occur over two different in-water work windows, with approximately 2,000 truck trips occurring during each phase. Peak truck traffic would be expected to occur during active dredging and material transport operations, which is often during the standard working day. The majority of trips would be made by commercial trucks transporting dredged material from an industrial facility to the final disposal site.

No specific transportation models were used to estimate traffic impacts, as vehicle trips would be limited to the duration of dredging and material transport activities.

f. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The Project is not expected to affect the movement of agricultural and forest products on roads and streets in the area because the truck traffic generated by project activities would use roads internal to the port and State Route 501, consistent with the truck trips generated by current maintenance dredging activities or other industrial activities that occur within port facilities.

g. Proposed measures to reduce or control transportation impacts, if any.

Transportation impacts are not anticipated; therefore, measures to reduce or control transportation impacts are not proposed.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The Project would not result in an increased need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

The Project would not affect public services; therefore, no measures to reduce or control impacts are proposed.

16. Utilities

Circle utilities currently available at the site:

a. electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other:

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new or modified utilities are proposed as part of the Project.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

X

SEPA Responsible Offical

Type name of signee: Click or tap here to enter text.

Position and agency/organization: Click or tap here to enter text.

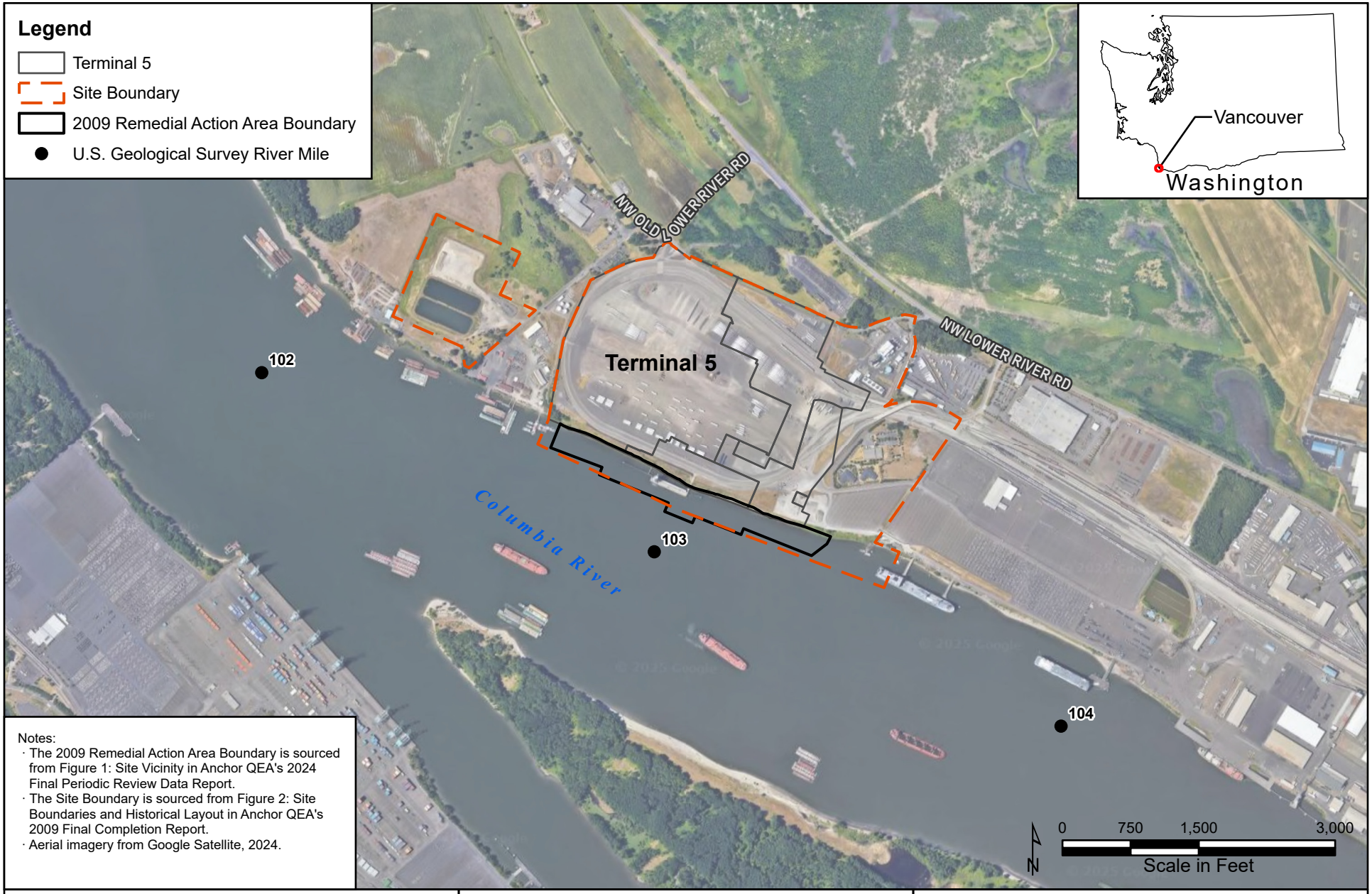
Date submitted: Click or tap to enter a date.

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix D

Figures



Notes:
- The 2009 Remedial Action Area Boundary is sourced from Figure 1: Site Vicinity in Anchor QEA's 2024 Final Periodic Review Data Report.
- The Site Boundary is sourced from Figure 2: Site Boundaries and Historical Layout in Anchor QEA's 2009 Final Completion Report.
- Aerial imagery from Google Satellite, 2024.

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Interim Action SEPA Checklist
Port of Vancouver
Terminal 5 Alcoa Vancouver Site
Vancouver, Washington

Figure 1
Vicinity Map

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3/4/2025

Legend

- Approximate Area Interim Action Dredging (2)
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Existing Structures
- 5-foot Bathymetry Contour (CRD)

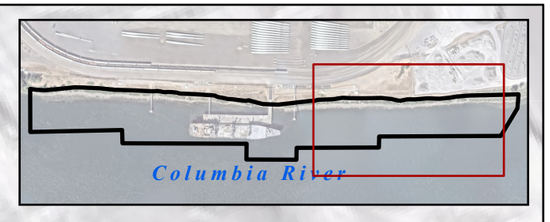
Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

- >700
- >110-700
- >97-110
- ≤ 97

Notes:
1. Interpolated surface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCBs results from sediment grab samples (0–10 centimeters below mudline) and core sample results from the 0–0.5 feet below mudline interval. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. Extent of dredging (and individual dredge units) will be defined after the pre-design investigation and final design.
   · Bathymetry contours created from 2022 Conditions Survey.
   · Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CRD = Columbia River Datum
µg/kg = Micrograms per kilogram
PCB = Polychlorinated biphenyl

0 40 80 160
Scale in Feet



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Interim Action SEPA Checklist
Port of Vancouver
Terminal 5 Alcoa Vancouver Site
Vancouver, Washington

Figure 2a
Approximate Area of Interim Action Dredging

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3/24/2025

Legend

- Approximate Area Interim Action Dredging (2)
- 2009 Remedial Action Area Boundary
- 2009 Shoreline Armored Cap Area
- Existing Structures
- 5-foot Bathymetry Contour (CRD)

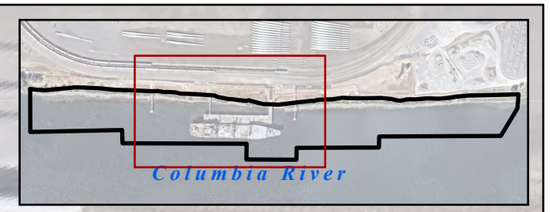
Interpolated Surface Sediment Total PCBs Concentration (µg/kg) (1)

- >700
- >110-700
- >97-110
- ≤ 97

Notes:
1. Interpolated surface sediment total PCBs concentration was generated via inverse distance weighted interpolation of total PCBs results from sediment grab samples (0–10 centimeters below mudline) and core sample results from the 0–0.5 feet below mudline interval. Interpolation results are shown for the in-water portion of the 2009 Remedial Action Area.
2. Extent of dredging (and individual dredge units) will be defined after the pre-design investigation and final design.
   · Bathymetry contours created from 2022 Conditions Survey.
   · Orthoimagery obtained from Nearmap, 2024.

Abbreviations:
CRD = Columbia River Datum
µg/kg = Micrograms per kilogram
PCB = Polychlorinated biphenyl

0 40 80 160
Scale in Feet



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Interim Action SEPA Checklist
Port of Vancouver
Terminal 5 Alcoa Vancouver Site
Vancouver, Washington

Figure 2b
Approximate Area of Interim Action Dredging

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3/24/2025

Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix E
Inadvertent Discovery Plan

INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): Port of Vancouver Terminal 5 Location: Vancouver, WA

Project Lead/Organization: Ecology County: Clark

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP should always be kept at the project site** during all project activities. All staff, contractors, and volunteers should be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move.***
- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact		Alternate Contact	
Name:	Erin Murray	Name:	Jessi Massingale
Organization:	Floyd|Snider	Organization:	Floyd|Snider
Phone:	(206) 805-2171	Phone:	(206) 805-2157
Email:	erin.murray@floydsnider.com	Email:	jessi.massingale@floydsnider.com

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager		Alternate or Cultural Resource Contact	
Name:	Dave Johnson	Name:	John Klem, Archaeologist
Program:	Toxics Cleanup	Program:	Toxics Cleanup
Phone:	(360) 338-2638	Phone:	(206) 556-5584
Email:	dave.johnson@ecy.wa.gov	Email:	jonk461@ECY.WA.GOV

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe:	Yakama Nation	Tribe:	Cowlitz Tribe
Name:	Rose Ferri	Name:	James Gordon
Title:	Interim THPO	Title:	THPO
Phone:	(509) 307-2009	Phone:	(360) 577-5680 Ext. 2222
Email:	Rose_Ferri@yakama.com	Email:	jgordon@cowlitz.org
Tribe:	Chinook Tribe	Tribe:	Confederated Tribes of Siletz Indians
Name:	Tony Johnson	Name:	Buddy Lane
Title:	Chair	Title:	Cultural Resources Manager
Phone:	(360) 875-6670	Phone:	(541) 444-2532
Email:	office@chinooknation.org	Email:	BuddyL@ctsi.nsn.us

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:		State Agency:	
Agency:	Not applicable	Agency:	Not applicable
Name:		Name:	
Title:		Title:	
Phone:		Phone:	
Email:		Email:	

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL MATERIAL

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: *RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):
   - Local Medical Examiner or Coroner name and phone: Martha Burt - (564) 397-2595
   - Local Law Enforcement main name and phone: Vancouver Police Department - (360) 487-7500
   - Local Non-Emergency phone number (911 if without a non-emergency number): 311 or (360) 693-3111
2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. Organizations may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessment are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

The archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below

surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the sites and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)
(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Interactive Map of Tribes by Area
(https://dahp.wa.gov/archaeology/tribal-consultation-information)

WSDOT Tribal Contact Website
(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Shalwater Bay Indian Tribe
Earl Davis, Cultural Resources
Phone: (360) 267-0731

Confederated Tribes of the Grand Ronde
David Harrelson, THPO
Phone: (503) 879-1630

Please note that the Project is located within areas that have been previously dredged and would focus on accumulated deposits of river sediment. No cultural resources have ever been identified during previous work. Therefore, the risk of disturbing cultural resources is low.

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.

Stone artifacts from Oregon.

Stone artifacts from Washington.

Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.

Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.

Artifacts from unknown locations (left and right images).

Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.

Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants. Right: Bone Pendants. Both from Oregon and Washington.*

Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.

Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP).*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry*.

Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- "Unusual" accumulations of rock (especially fire-cracked rock).
- "Unusual" shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a "layer cake" appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the "unusual" or out of place (for example, rock piles in areas with otherwise few rocks).

Shell Midden pocket in modern fill discovered in sewer trench.

Underground oven. Courtesy of DAHP.

Shell midden with fire cracked rock.

Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.

Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.

Main Image: *Dishes, bottles, workboot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*

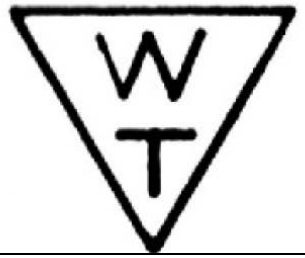
Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.

Far Left: .303 British cartridge found by a WCC planting crew on Skagit River. Don't ever touch something like this!
Left: Maker's mark on bottom of old bottle.

Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*



Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).

Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

You see historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.

Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see...

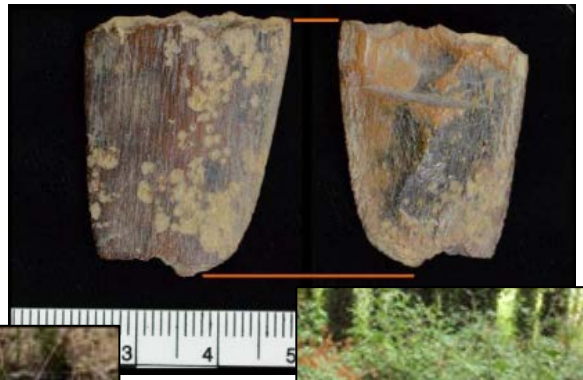
Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.



Directly Above: This is a real discovery at an Ecology sewer project site.

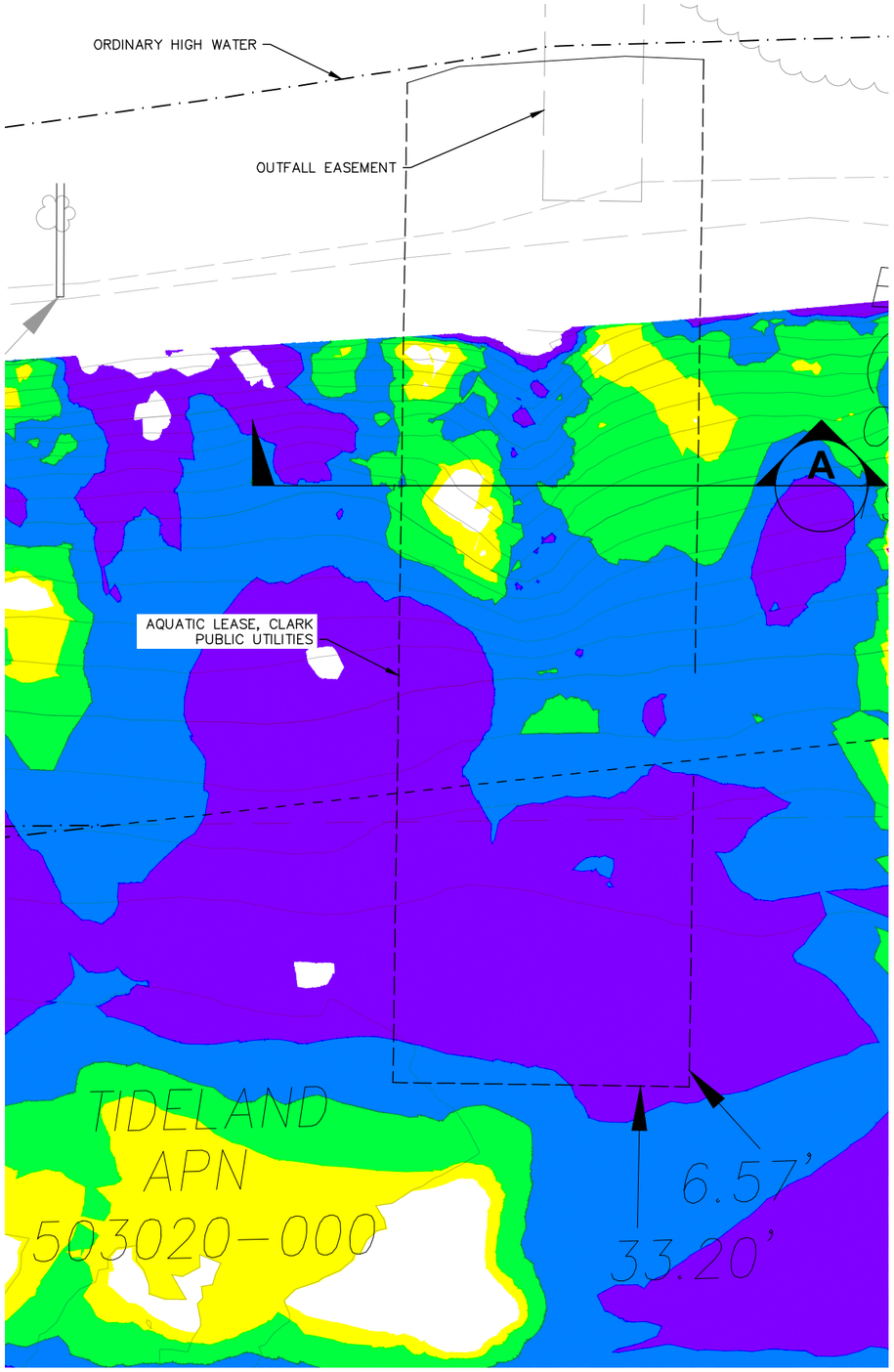
What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*

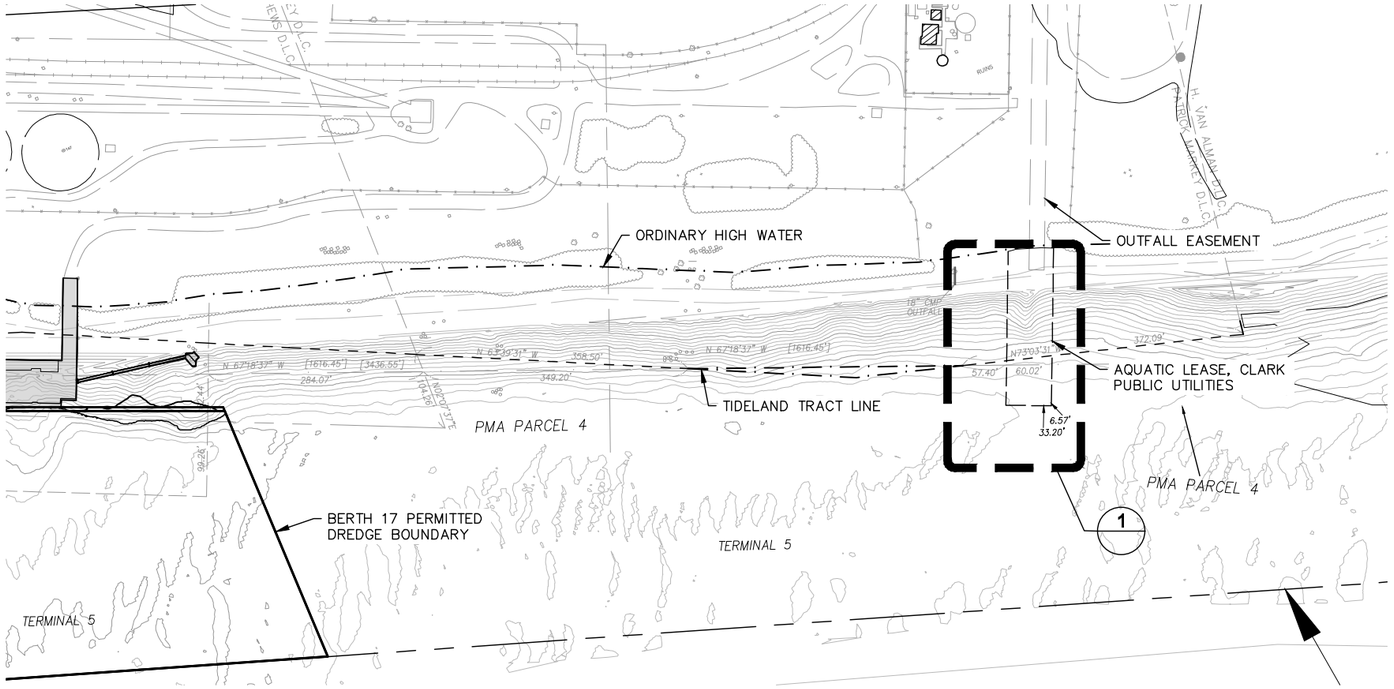
Interim Action Work Plan

Port of Vancouver Terminal 5 Alcoa Vancouver Site

Appendix F
2009 to 2020 Bathymetric Comparison of Terminal 5 Sediments

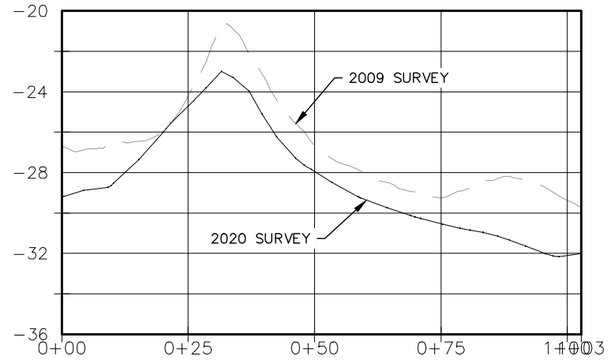


1 **OUTFALL NEAR B17**
SCALE: 1" = 30'



2009 TO 2020 SURVEY COMPARISON			
NUMBER	MAX DEPTH	MIN DEPTH	COLOR
1	0.50	1.00	
2	−1.00	−0.50	
3	−2.00	−1.00	
4	−3.00	−2.00	
5	−5.00	−3.00	

POSITIVE VALUES INDICATE DEPOSITION OF MATERIAL BETWEEN 2009 AND 2018 BATHYMETRIC SURVEYS. NEGATIVE VALUES INDICATE A LOSS OF MATERIAL. EXISTING CONTOURS SHOWN FROM ETRAC SURVEY PERFORMED IN 2020.



A **OUTFALL SECTION**

NOTES:
1. BATHYMETRIC SURVEY PERFORMED BY ETRAC IN 2020. HORIZONTAL DATUM SHOWN IS NAD83(2007), VERTICAL DATUM SHOWN IS COLUMBIA RIVER DATUM (CRD).
2. 2009 SINGLE BEAM BATHYMETRIC SURVEY PERFORMED BY ETRAC IN MARCH 2009 UPON COMPLETION OF CLEANUP PROJECT.

100' 0 200' 400'
SCALE: 1"=200'

DRAFT - FOR DISCUSSION PURPOSE ONLY

DRAFT

kpff
1601 5th Avenue, Suite 1300
Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

OUTFALL NEAR B17
2009 TO 2020 SURVEY COMPARISON

DATE: 10/22/2020	SCALE: VARIES
DRAWN BY: BED	SHT 1 OF 7

Plotted: Sep 28, 2020 - 1:36pm bdonahue Layout: Ex 1 (2)
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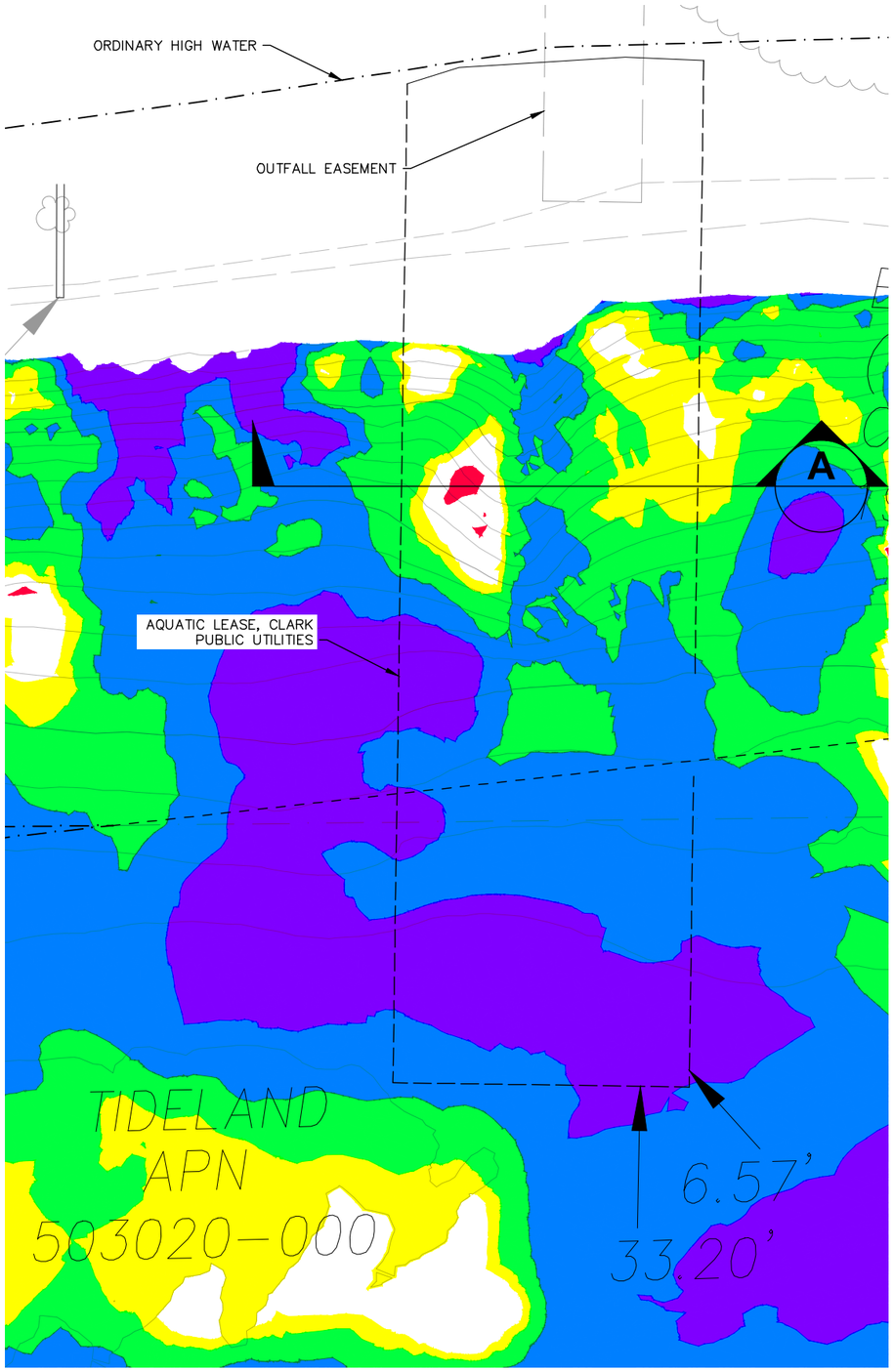
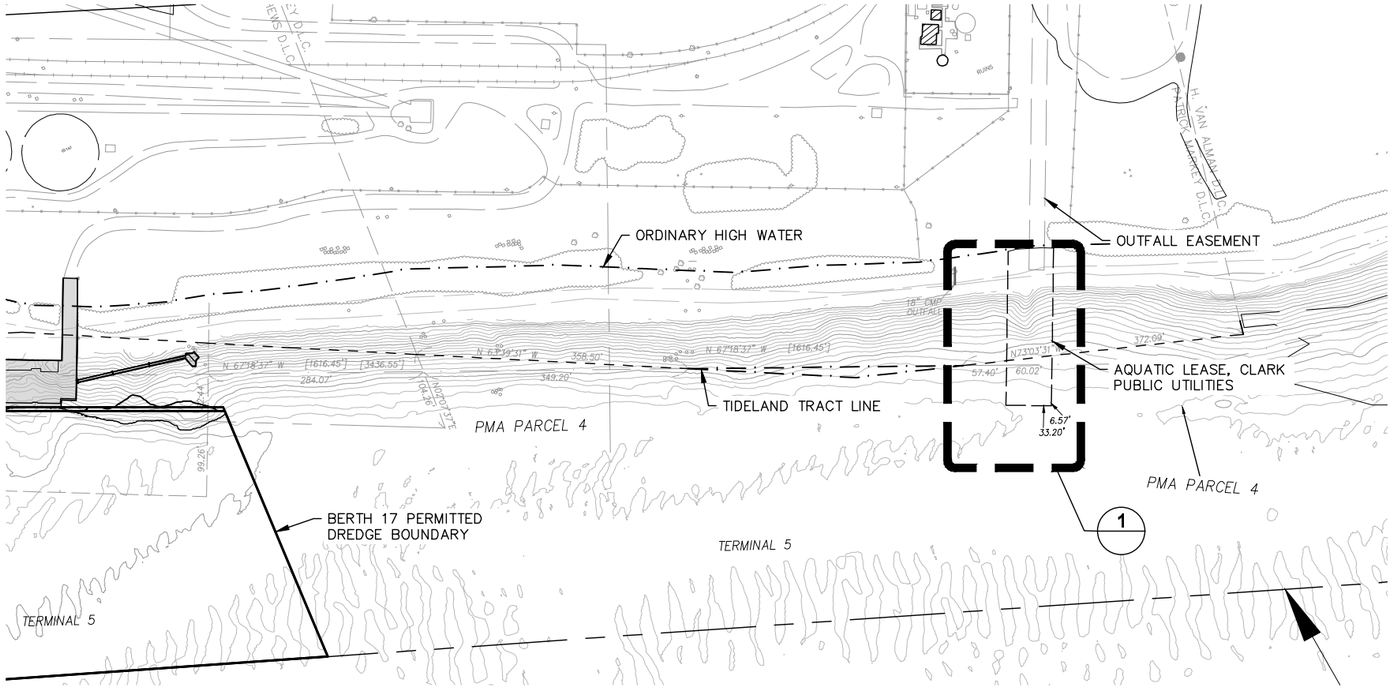
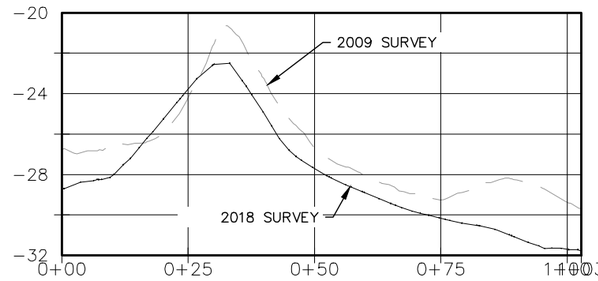


1 **OUTFALL NEAR B17**
SCALE: 1" = 30'



2009 TO 2018 SURVEY COMPARISON			
NUMBER	MAX DEPTH	MIN DEPTH	COLOR
1	0.50	1.00	
2	−1.00	−0.50	
3	−2.00	−1.00	
4	−3.00	−2.00	
5	−5.00	−3.00	

POSITIVE VALUES INDICATE DEPOSITION OF MATERIAL BETWEEN 2009 AND 2018 BATHYMETRIC SURVEYS. NEGATIVE VALUES INDICATE A LOSS OF MATERIAL. EXISTING CONTOURS SHOWN FROM ETRAC SURVEY PERFORMED IN 2018.



A **OUTFALL SECTION**

NOTES:
1. BATHYMETRIC SURVEY PERFORMED BY ETRAC JULY 2018. HORIZONTAL DATUM SHOWN IS NAD83(2007), VERTICAL DATUM SHOWN IS COLUMBIA RIVER DATUM (CRD).
2. 2009 SINGLE BEAM BATHYMETRIC SURVEY PERFORMED BY ETRAC IN MARCH 2009 UPON COMPLETION OF CLEANUP PROJECT.

100' 0 200' 400'
SCALE: 1"=200'

DRAFT - FOR DISCUSSION PURPOSE ONLY

DRAFT

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Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

OUTFALL NEAR B17
2009 TO 2018 SURVEY COMPARISON

DATE: 10/22/2020	SCALE: VARIES
DRAWN BY: BED	SHT 2 OF 7

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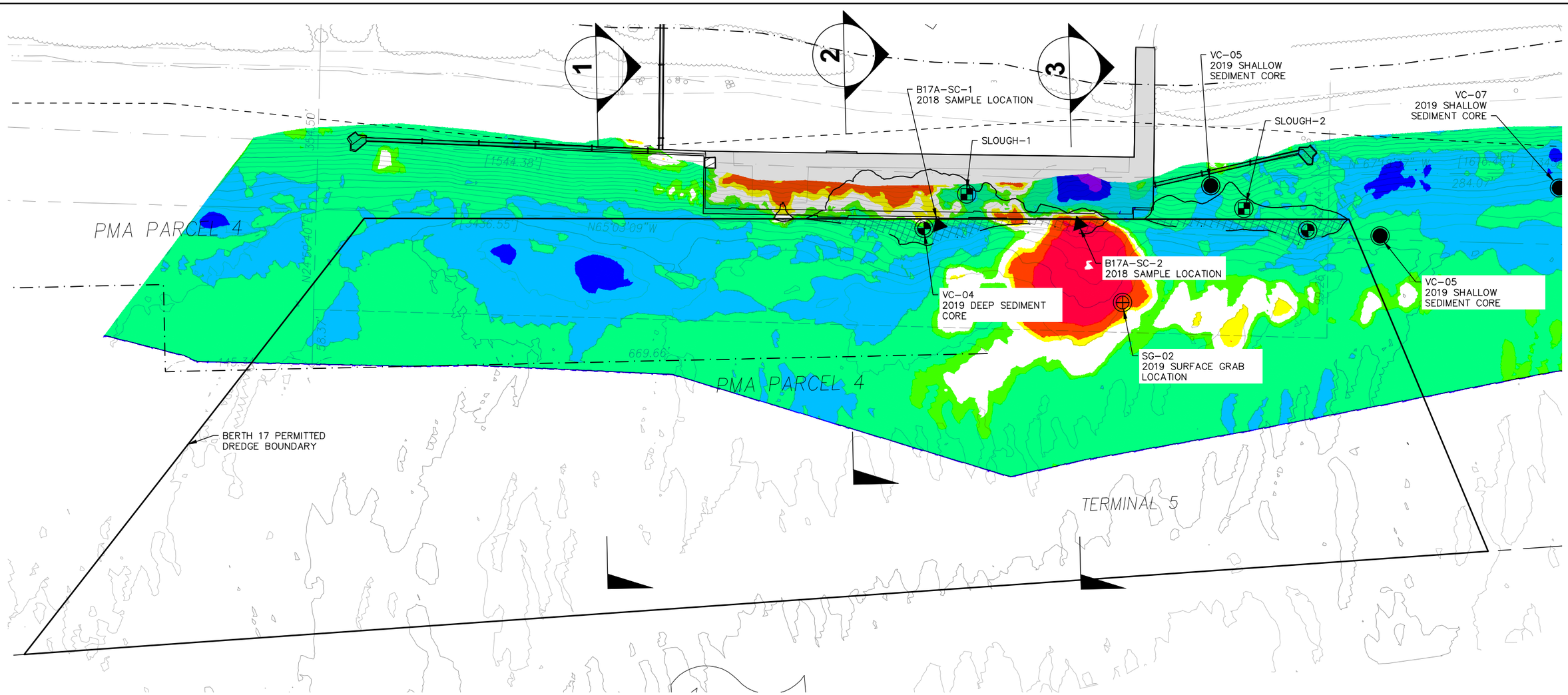

NOTES:
1. BATHYMETRIC SURVEY PERFORMED BY ETRAC IN 2020. HORIZONTAL DATUM SHOWN IS NAD83(2007), VERTICAL DATUM SHOWN IS COLUMBIA RIVER DATUM (CRD).
2. 2009 SINGLE BEAM BATHYMETRIC SURVEY PERFORMED BY ETRAC IN MARCH 2009 UPON COMPLETION OF CLEANUP PROJECT.
3. 2020 SURVEY SHOWN. COLOR BANDING REPRESENTS THE ELEVATION DIFFERENCE FROM THE 2009 BATHYMETRIC SURVEY TO THE 2020 BATHYMETRIC SURVEY. RED, YELLOW AND GREEN INDICATE AREAS OF APPARENT SCOUR. BLUE AND PURPLE INDICATE AREAS OF APPARENT BUILDUP SINCE THE 2009 POST CLEANUP BATHYMETRIC SURVEY.

2009 TO 2020 SURVEY COMPARISON

NUMBER	MAX DEPTH	MIN DEPTH	COLOR
1	3.00	8.00	
2	1.00	3.00	
3	0.50	1.00	
4	−1.00	−0.50	
5	−3.00	−1.00	
6	−5.00	−3.00	
7	−8.00	−5.00	
8	−12.00	−8.00	

POSITIVE VALUES INDICATE DEPOSITION OF MATERIAL BETWEEN 2009 AND 2020 BATHYMETRIC SURVEYS. NEGATIVE VALUES INDICATE A LOSS OF MATERIAL. EXISTING CONTOURS SHOWN FROM ETRAC SURVEY PERFORMED IN 2020.

N

50' 0 50' 100'

SCALE: 1"=100'

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Seattle, Washington 98101
(206) 382-0600 Fax (206) 382-0500

B17 COMPARISON OF 2009 & 2020 BATHYMETRIC SURVEYS

DATE: 10/22/2020 | SCALE: 1:100

DRAWN BY: BED | SHT 3 OF 7

Plotted: Oct 22, 2020 - 8:42am bdonahue Layout: EX2
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