

**PORT OF FRIDAY HARBOR
ALBERT JENSEN AND SONS INC. BOATYARD AND MARINA
FRIDAY HARBOR, WA**

**MODEL TOXICS CONTROL ACT (MTCA)
AGREED ORDER No. DE 18071**

**REMEDIAL INVESTIGATION REPORT – UPLAND AREA
*PUBLIC REVIEW DRAFT***

Prepared for
The Port of Friday Harbor
Friday Harbor, WA



Prepared by
Leon Environmental, LLC and CRETE Consulting Inc.
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January 23, 2026

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Abbreviations and Acronyms

µg/kg	micrograms per kilogram
ADA	American With Disability Act
BLWA	boat lift work area
BTEX	benzene, toluene, ethylbenzene, and xylene
cm	centimeter
COC	Constituent of Concern
CoC	contaminant of concern
COI	Constituent of Interest
COPC	Contaminant of Potential Concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CRETE	CRETE Consulting Inc.
CSL	cleanup screening level
DCAP	Draft Cleanup Action Plan
DDD	Dichlorodiphenyldichloroethane
DDT	Dichlorodiphenyltrichloroethane
DMMP	Dredged Material Management Program
Ecology	Department of Ecology
FDA	Former Dumping Area
FS	Feasibility Study
ft bgs	feet below ground surface
IOSA	Islands' Oil Spill Association
Jensen	Albert Jensen and Sons Boatyard and Marina
L-E	Leon Environmental, LLC
mg/kg	milligrams per kilogram
MNR	monitored natural recovery
mS/cm	milliSiemens/centimeter
MTC	Marine Technical Center
MTCA	Model Toxics Control Act
NPDES	National Pollutant Discharge Elimination System
OHW	ordinary high water
OPALCO	Orcas Power and Light Company
Order	Agreed Order No. DE 18071
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PoFH	Port of Friday Harbor
ppt	parts per trillion
PQL	practical quantitation limit
RI	Remedial Investigation
SCO	sediment cleanup objective
SCUM	Sediment Cleanup User's Manual
SGC	silica gel cleanup
Shipyard Cove	Shipyard Cove Marina
SL	screening level
SLR	sea level rise
SMA	sediment management area
SMS	Sediment Management Standards

SQS	Sediment Quality Standard
SRWA	ship rail work area
TEE	Terrestrial Ecological Evaluation
TBT	tributyltin
TEQ	toxicity equivalent
Town	Town of Friday Harbor
TPH	total petroleum hydrocarbon
USDA	U.S. Department of Agriculture
VOC	volatile organic compound
WAC	<i>Washington Administrative Code</i>
WDNR	Washington State Department of Natural Resources

Engineer's Certification

I certify that the Upland Remedial Investigation for the Albert Jensen and Sons Inc. Boatyard and Marina Site (located at 1293 Turn Point Road, San Juan Island, WA 98250) was completed by me or by a person under my direct supervision.

Work for this project was performed in accordance with generally accepted professional practices for the nature and condition of work completed in the same or similar localities, at the time the work was performed. No other warranty, express or implied, is made.

DRAFT

Grant Hainsworth P.E., Principal
Washington State PE Number: 33192
Expiration Date: 6/5/2027

1. INTRODUCTION

The mutual objective of the State of Washington, Department of Ecology (Ecology) and the Port of Friday Harbor (PoFH) under Agreed Order No. DE 18071 (Order) is to provide for remedial action at Albert Jensen and Sons Inc. (Cleanup Site ID 14759) (Site or Jensen's) where there has been a release or threatened release of hazardous substances. The work under the Order involves conducting a Remedial Investigation (RI) and Feasibility Study (FS), conducting interim actions if required or agreed to by Ecology, and preparing a preliminary Draft Cleanup Action Plan (DCAP) to select a cleanup alternative. The purpose of the RI/FS, and preliminary DCAP for the Site, is to provide sufficient data, analysis, and evaluations to enable Ecology to select a cleanup alternative for the Site.

The goal of this project is to clean up the historical contamination at Jensen's and to revitalize and expand existing uses at this industrial facility, which serves as a community and economic hub. The mandate from the Friday Harbor community is to honor the Site's history and its central role in shaping the Friday Harbor community, while providing: environmental restoration; commercial boatyard services; and a platform to provide the economic opportunity local businesses need to thrive.

This RI Report has been prepared to satisfy requirements of the Agreed Order and Washington Administrative Code (WAC) Sections 173-340-350(6) and 173-204-550(6). The Order requires the PoFH to address both upland and in-water Site contamination. This RI Report documents the nature and extent of contamination in the upland portion of the Site. A separate RI Report will document the nature and extent of contamination in the sediment portion of the Site. The respective information will be used to develop the FS Report and DCAP for both the upland and sediment in accordance with WAC 173-340-356 through 173-340-390.

1.1 Site Description and Background

The Site is located at 1293 Turn Point Road on the southern shore of Shipyard Cove of the Salish Sea, on San Juan Island, San Juan County. Turn Point Road provides a direct connection from the Town of Friday Harbor (Town) to the Site, which is located approximately 1.5 miles southeast of downtown. Turn Point Road continues to the east to Kansas Cove, and then becomes Pear Point Road as it follows the Island's southern shoreline to circle back to the Town. The Site is located entirely within Shipyard Cove, a relatively shallow embayment that faces northward on the eastern side of San Juan Island. Shipyard Cove is generally protected by Brown Island; however, the Site is exposed to roughly 2.5 miles of fetch from a northerly direction (Figure 1-1). For the purpose of performing the RI/FSs, and development of DCAPs, the division between upland and sediment portions of the Site is the High Tide Line (HTL). Based on available tidal records, the HTL is defined based on the highest astronomical tide: 9.2 feet Mean Lower-Low Water (MLLW; Figure 1-2).

The PoFH purchased the Site from Albert Jensen and Sons, Inc. with the intent to address existing environmental concerns. The Site encompasses an upland area of approximately 4.8 acres with 652 linear feet of shoreline and approximately 5 acres of aquatic lands currently managed under a Port Management Agreement (PMA No. 20-080023) with the Washington State Department of Natural Resources (WDNR). The Site is partially developed and is currently underutilized due to impaired Site conditions. Surrounding land uses include industrial, commercial, and residential development. The Port also owns and operates Shipyard Cove Marina and a barge ramp, which are located immediately to the

northwest of Jensen's. Residential properties with private docks extend along the shoreline to the northeast of Jensen's.

The Port operates Jensen's and Shipyard Cove Marina as a single facility that it refers to as Jensen's Shipyard Cove Facility. Shipyard Cove Marina has been identified by Ecology as a separate state cleanup site (Cleanup Site ID 17287) and will be cleaned up under a separate process from Jensen's (Ecology 2025).

1.2 General Site Information

Albert Jensen and Sons, Inc. Boatyard and Marina
1293 Turn Point Road
Friday Harbor, WA 98250
Section 13, Township 35N, Range 3W
Parcel 351341005000

The project coordinator for the Port of Friday Harbor is:

Todd Nicholson
204 Front Street
Friday Harbor, WA 98250
360-378-2688
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1.3 Vulnerable Populations and Overburdened Communities

The Site is not located within a likely vulnerable population or overburdened community as it does not satisfy any of the test criteria outlined in Ecology guidance (Ecology 2024a):

1. The Site is not located in a census tract that ranks a 9 or 10 on the Environmental Health Disparities Index from the Washington State Department of Health's EHD Map¹
2. The Site is not located in a census tract that is at or above the 80th Washington state percentile of the Demographic Index from the U.S. Environmental Protection Agency's EJ Screen²
3. The Site is not located in a census tract that is at or below the 80th Washington state percentile of the Supplemental Demographic Index from the U.S. Environmental Protection Agency's EJ Screen

1.4 Report Organization

In accordance with the Agreed Order and WAC 173-204-550(6), the remaining sections of this report provide the following:

- Section 2 – summary of relevant Site history and land uses
- Section 3 – summary of previous environmental investigations
- Section 4 – identification of applicable exposure pathways, and proposed cleanup standards for the upland portion of the Site
- Section 5 – a conceptual Site model (CSM) for the upland portion of the Site
- Section 6 – summary of the nature and extent of upland contamination
- Section 7 – RI conclusions

¹ <https://fortress.wa.gov/doh/wtnibl/WTNIBL/Map/EHD>

² EPA's online EJ Screen tool was not active at time of this draft report. The tool was accessed through this non-EPA link: <https://pedp-ejscreen.azurewebsites.net/>

2. SITE HISTORY AND LAND USE

2.1 Historical Ownership and Land Use

Over a century of industrial uses have contributed to legacy contamination at this historical maritime Site. The Site was first developed as a shipyard before 1941. Anecdotal evidence suggests that operations began as early as 1910. Originally, wooden boats were manufactured at the Site, but when wooden boats were phased out in the middle of the 20th century, the Site use moved from shipbuilding to boat repair and maintenance.

According to Ecology (Ecology 2024), the San Juan Historical Society reports that in the early 1940s a local entrepreneur started a shipyard business employing 15 men year-round who built wooden boats for fishing, towing and other uses. A large part of the business focused on hauling local fishing boats out of the water and lined up along the beach for winter maintenance and repairs. The business repaired, serviced and returned boats to the water one at a time until all were ready for the start of fishing season. During World War 2, the shipyard held a contract to build military barges. The Site also contained a log dump for San Juan Island logging industry. Logs would be branded on the end, dumped into the water and formed into log booms to be towed to lumber mills around Puget Sound.

Additional facilities, including a marina extending from the central shoreline into deeper intertidal and subtidal areas, and an upland fill area along the western property boundary extending from the upland into shallow intertidal areas, were built sometime between 1941 and 1972. Activities at the shipyard that likely contributed to increased contamination concentrations include the application and removal of antifouling paints, mechanical, and general maintenance work both over water and land, and treatment of wooden boats using pesticides. Also present on Site was a former underground gasoline storage tank, a machine shop that was also used for hazardous chemical storage, a small dump site, and a marine railway.

Figure 2-1a illustrates the approximate location of known historical site features. Images from the San Juan Historical Society which depict prior Site facilities are provided in Figures 2-2 and 2-3.



Figure 2-2. Overview of historical Site facility uses (Ecology 2024).



Figure 2-3. Historical Site facility uses, facing north, toward Shipyard Cove (Ecology 2024).

2.2 Current Conditions and Land Use

Jensen's is partially developed and is still used as a boat maintenance facility and shipyard (Figure 2-1). Based on the needs of the Friday Harbor community, the Port plans to maintain and expand current facility operations.

The Site consists of three distinct areas: a boatyard, a marina, and an undeveloped upland and shoreline area. Jensen's is zoned as Rural Industrial which allows for light industrial, light manufacturing, seasonal residential, public, and some institutional uses. While this RI is focused on the upland portion of the Site, the following sections provide a brief summary of the current conditions and land use in each of these areas for context. Further details concerning the sediment portion of the Site will be presented in the sediment area RI.

2.3.1 Boatyard

The existing boatyard is located in the southwestern portion of the parcel. It encompasses approximately 1.5 acres of level work areas including boat storage, a laydown area, and a wash pad. Four buildings are associated with current boatyard operations: an office/retail building, a machine shop, a storage building, and a water treatment building through which stormwater collected from the BLWA is circulated and then discharged via an outfall. At the back of the office/retail building is a septic system drain field that is connected to interior bathrooms. The shop building is used for small equipment maintenance and repair (e.g., small engine repair). A small quantity of fuel and lubricants are stored in this building. The boatyard infrastructure also includes a 35-ton travel lift. The Port is in the process of removing the travel lift pier and replacing it with a new haul out pier located in the adjacent Shipyard Cove Marina section of the

Port's larger Jensen's Shipyard Cove Facility. The Port may propose this work as an Interim Action under the Order in the future.

The marine services currently provided at the boatyard include haul-out, pressure wash, bottom paint, light mechanical, chandlery and parts, and boat storage. Water from the wash pad and boat maintenance activities is collected and disposed offsite. The boatyard area has several areas where maintenance was deferred by the prior owner and ongoing releases from the degraded structures (e.g., visible sheen associated with the creosote pilings) have been observed. The Port is working to address these issues as work under the Order proceeds. For example, the Port installed sleeves around the boat lift pier pilings, which are reducing the extent to which piling creosote is exposed to marine waters.

The shoreline along the active boatyard area is characterized by vertical structures and steep berms. The boat lift consists of two piers supported by creosote-treated piling (the boat lift pier), ecology blocks, and a concrete wall. A deteriorating overwater dock and the main walkway pier are located immediately east of the existing boat pullout area. The shoreline at this location is a stacked ecology block bulkhead, through which uncharacterized upland fill material is sloughing into intertidal areas. Along the western property line, a fill area partially contained by a failing creosote-treated bulkhead extends from the upland out into intertidal area. This bulkhead is in an advanced state of failure, acting as a source of creosote-treated wood debris and allowing uncharacterized fill to spill into intertidal areas. The intertidal areas here are barren of vegetation except for sparse, non-native species.

The Port plans to continue implementing Site improvements that are consistent with the existing boatyard uses, including improving paved working areas to expand upon existing uses.

2.3.2 Marina

Jensen's continues to operate an active marina that occupies the deeper intertidal and subtidal areas of the Site. The existing marina consists of approximately 30 slips, shown on Figure 2-1b.

The original marina included: a concrete floating breakwater; a system of solid-decking floats built primarily from treated-wood and open-cell Styrofoam float boxes; creosote-treated wood piles and dolphins; an elevated pier and wave wall constructed of creosote-treated wood; treated-wood and metal ramps connecting the float and elevated pier system; covered multi-slip moorage and an individual boathouse built with metal roofs and side walls; and a main walkway pier constructed of treated-wood.

Marina infrastructure underwent extensive repair and replacement under federal, state, and local emergency authorizations in 2021 after a winter storm drastically damaged an already failing marina. The Port obtained 'after-the-fact' permits for this repair and replacement work after the most critical marina infrastructure was restored. Of the original marina infrastructure, only the original main walkway pier and portions of the concrete breakwater remain. Nearly all of the permitted reconstruction work is complete. In addition to the original main walkway pier, current marina structures include a new system of floats and floating finger piers consisting of steel piles and fully grouted floats, and various standalone piles and dolphins. Replacement covered moorage has been completed using steel frames and transparent polycarbonate roofing. The permitted replacements for the original covered moorage were built without side walls and features clear roofs to allow light penetration.

The entire shoreline area, extending from intertidal elevations out to at least shallow subtidal depths, is heavily impacted with a substantial volume of debris, including concrete, tires, metal (motors, small parts, etc.), plastic, and other general rubbish. Within the former boathouse areas, there appears to be some debris present on the seafloor, including tires that can be observed from the marina floats. The Port intends to remove much of this debris as mitigation for subsequent permitted actions throughout the larger Jensen's Shipyard Cove Facility.

2.3.3 Undeveloped Upland and Shoreline Areas

The undeveloped area in the eastern portion of the property consists of approximately 2 acres of open grassy field and gravel parking areas. This area slopes moderately from Turn Point Road toward the waterfront and terminates at a low bank.

A derelict boat building structure located near the shoreline east of the current boatyard area was removed by the Port in 2023, shown on Figure 2-1a. Four rails (two rails per pair), which appear to be composed of deteriorating 10-inch x 10-inch creosote-treated timbers, extend from the intertidal area waterward of the derelict boat building structure out to subtidal elevations (Figure 2-1a). It is not clear how far the rails extend, because they dive under the sediments at approximately 85 feet from the waterward edge of the concrete pad. The marine rails were originally used to launch boats and were later used to pull out boats for repair. These derelict structures are likely sources of contamination to upland, intertidal, and subtidal areas. The concrete pad at this location was added later and is not original to the marine rail system.

The undeveloped area also contains the remnants of a small derelict cabin (Figure 2-1a), a small oil storage building further east, and a shallow dug well. An underground storage tank was formerly located in the field south of the oil storage building. The upper shoreline area appears to be composed of upland fill material and garbage (metal, plastic, concrete, wood waste, etc.), which is consistent with historical descriptions of the area being used as a dump. The garbage and fill material from the upper shoreline are emerging from the bank as it descends to upper intertidal elevations. There appears to be a remnant shoreline timber (some treated) structure, possibly an old pier or ramp, which has left a debris pile extending from the upper shoreline down to intertidal elevations. These observations are generally consistent with the images Ecology obtained from the San Juan Historical Society, which are provided as Figures 2-2 and 2-3 (Ecology 2024).

3. UPLAND FIELD INVESTIGATIONS

3.1 Investigation Areas

The Site has been divided into the following key subareas for the purposes of conducting past remedial investigation activities. The general location of each area may be found on Figure 2-1b. Further details of each area are provided in the discussion of the Site CSM (Section 6).

- **Ship Rail Work Area:** The ship rail work area (SRWA) includes rail lines east of the pier and the old boat building structure. The SRWA has a lower elevation than the surrounding upland, including high intertidal elevations with abundant pickleweed.
- **Boat Lift Work Area:** The boat lift work area (BLWA) is an approximately 100-foot-wide area along the shoreline, immediately west of the SRWA and extending west to the western property line. The adjacent shoreline, from west to east, includes the small fill area that projects into the water, the berm area with an outfall, the boat pullout, the old overwater deck, and the marina pier.
- **Former Debris Dumping Area:** The former dumping area (FDA) is located to the east of the SRWA along the shoreline.
- **IOSA/MTC Area:** An area located east of the SRWA and close to the FDA. This area was identified in the past for potential development of a new headquarters building for the Islands' Oil Spill Association (IOSA) and, more recently, as the location of a potential Marine Trades Center (MTC).
- **Former Above Ground Storage Tank:** It is suspected that an Above Ground Storage Tank (AST) was formerly located south of the central former shop building. There is no documentation regarding the size or contents of the former AST.
- **Shop Floor Drain:** The shop building includes a 3-inch diameter floor drain near the northwest corner of the building. The drain was used to dispose of liquids from the machine shop.
- **Stormwater Pond:** Wash water within the working areas of the BLWA was collected, treated, and then discharged to a stormwater detention pond. The stormwater pond was located in the southwest portion of the property, west of the shop building. The pond was removed from service in 2021 with the pond liner and sediment disposed by Clean Harbors and the berms re-graded.
- **Former Orcas Power and Light Company Pad:** A former Orcas Power and Light Company (OPALCO) storage area is located in the western portion of the Site. The pad is the building foundation of an OPALCO building that burnt down.
- **Wooded Hillside Area Along Turn Point Road:** The wooded hillside area is south of the OPALCO pad area, the stormwater pond, and the shop building.

3.2 Previous Investigations

Previous environmental investigations related to the upland portion of the Site are summarized below. This work has included soil and groundwater sampling, as well as sampling of stormwater pond and shop floor drain solids. Some sampling in the SRWA occurred below the HTL and those data are tabulated separately in this report. Investigation activities performed for the Site also included some investigation (e.g., soil sampling) conducted on the Shipyard Cove Marina Site, prior to its establishment as a separate MTCA cleanup site. Investigation activities and data relevant to the Shipyard Cove Marina Site are not included herein and will be reported under the cleanup process for that new site.

3.2.1 Phase I Environmental Assessment

A Phase I Environmental Site Assessment (ESA) was conducted at the Site in November 2017. The resulting Phase I ESA report (Whatcom Environmental Services 2017) concluded there was potential for site soil to be impacted by metals, petroleum, and solvents based on evidence of boatyard related uses.

3.2.2 2018 Initial Site Investigation

Fifteen soil samples were collected in January 2018 to characterize Site soil. The soil samples were analyzed by ALS Laboratory Group (ALS) for the following:

- Diesel- and oil-range total petroleum hydrocarbons (TPH) by NWTPH-Dx
- Gasoline range TPH by NWTPH-Gx
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021
- Naphthalenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and semi-volatile organic compounds by EPA Method 8270
- Lead, arsenic, cadmium, chromium, copper and zinc by EPA Method 6020
- Mercury by EPA Method 7471
- Polychlorinated biphenyl Aroclors (PCBs) by EPA Method 8082A
- Dioxins and furans by EPA Method 1613

The results identified concentrations of metals (primarily copper and lead), petroleum, and cPAHs that exceeded preliminary screening levels (Whatcom Environmental Services 2018).

The initial investigation included one composite sample of sediment from the former stormwater pond (Whatcom 2018). This sample was analyzed by ALS for the following:

- Lead, arsenic, cadmium, chromium, copper and zinc by EPA Method 6020
- Mercury by EPA Method 7471

The initial investigation also included a sample collected directly from the floor drain in the shop building. This sample and one sample collected within the SRWA (SRWA-3) were analyzed for volatile organic compounds by EPA Method 8260, in addition to the analyses listed above for soil. The results of the initial investigation are included on Tables 3-3 through 3-10. Investigation boring logs are included in Appendix A.

3.2.3 2018 Upland Site Investigation

Additional soil sampling was performed in July and August 2018 to further characterize the lateral and vertical extent of chemicals detected by the initial investigation. This work included 25 soil borings (56 samples). These soil samples were analyzed by ALS Laboratory Group (ALS) for the following (Whatcom Environmental Services 2018):

- Diesel- and oil-range TPH by NWTPH-Dx
- Gasoline range TPH by NWTPH-Gx
- BTEX constituents by EPA Method 8021
- Naphthalenes and cPAHs by EPA Method 8270E-SIM
- Lead, arsenic, cadmium, chromium, copper and zinc by EPA Method 6020
- Mercury by EPA Method 7471
- PCBs by EPA Method 8082A
- Dioxins and furans by EPA Method 1613

This investigation also included the installation and sampling of six groundwater monitoring wells (MW-1 through MW-6). All groundwater samples were analyzed by ALS for the following:

- Diesel- and oil-range TPH by NWTPH-Dx (with silica gel cleanup)
- Gasoline range TPH by NWTPH-Gx
- BTEX constituents by EPA Method 8021
- Naphthalenes and cPAHs by EPA Method 8270E-SIM
- Dissolved arsenic, cadmium, chromium, lead, mercury, copper, and zinc by EPA Method 200.8/245.1

As part of this investigation, one sediment sample was also collected from the stormwater pond (Whatcom 2018) and was analyzed for the following:

- Toxicity Characteristic Leaching Procedure (TCLP) by EPA Method 1311
- Standard Fish Bioassay by Ecology Method 80-12

Well construction details are included on Table 3-1. Measured groundwater elevations from recent quarterly groundwater sampling events is included on Table 3-2. Analytical results from the 2018 Upland Site Investigation are included on Tables 3-3 through 3-11. Investigation boring and well construction logs are included in Appendix A.

3.2.3 2020 IOSA/MTC Test Pits

On October 19, 2020, a small backhoe was used to excavate eight test pits within the IOSA/MTC Area located on the eastern side of the Site (Figure 3-1). The objective of this investigation was to further characterize an area that had been identified for potential development. The area is bounded to the west by the SRWA and the FDA along the shoreline to the north.

The test pits were dug as trenches of approximately 6 to 14 feet in length and varied in depth between 6.5 and 12 feet. Buried debris was encountered at three of the test pit locations (IOSA-TP5, IOSA-TP6, IOSA-TP7). The debris was concentrated in the area referred to as the FDA in earlier project documents. Following examination of the walls and bottom of the test pit, and examination of the excavated soil and debris, samples were collected from the sidewalls and bottom of each test pit. Each excavated test pit was subsequently backfilled with the trench spoils to approximately match the initial grade. Soil samples were submitted to Friedman & Bruya, Inc. for metals analysis by EPA Methods 6020 and 7471. One sample at IOSA-TP5 (from 5 feet below grade), where what appeared to be a small boat fuel tank was observed, was submitted for NWTPH-Dx, -Gx, and BTEX analyses. Initially the uppermost sample (1 foot below grade) was submitted for analysis, with other deeper samples placed on hold pending analysis. Additional samples from IOSA-TP-3, IOSA-TP5, and IOSA-TP6 were subsequently analyzed based on copper or zinc concentrations that exceeded preliminary screening levels. Results of the test pit investigation are included on Table 3-3.

3.3 2022 to 2024 Investigation Activities

In accordance with the RI Work Plan (Leon and CRETE 2022), additional environmental investigations were conducted to fill identified data gaps. Field logs and analytical reports for these investigations are provided in Appendices A, and B. Well construction details and measured groundwater elevations are shown on Tables 3-1 and 3-2, respectively. A summary of available soil and groundwater data are provided on Tables 3-3 through 3-11. Six sampling stations within the SRWA fall below the HTL. For completeness, the data is included in the Upland RI dataset, but is presented separately on Tables 3-9a through 3-9c.

3.3.1 Upland Soil Sampling

The following soil sampling activities were performed in July 2022 to further characterize the nature and extent of contamination in selected areas of the Site, in accordance with the RI Work Plan. Direct push

soil borings were completed in accordance with the methods described in the RI Work Plan (Leon and CRETE 2022). Sampling locations are shown on Figure 3-1. Selected soil samples from each boring were retained for laboratory analysis. The analytical suite selected for each sample was based on the sample location relative to known impacts, and Property history (potential impacts). Soil samples were analyzed by Friedman and Bruya, Inc., and Frontier Analytical Laboratory (dioxin/furans only) for the following:

- Metals by EPA Method 6020
- PCBs by EPA Method 8082A
- cPAHs by EPA Method 8270E and EPA Method 8270E-SIM
- Diesel- and oil-range TPH by NWTPH-Dx extended
- Organochlorine Pesticides by EPA Method 8081B
- Dioxins and furans by EPA Method 1613
- Organotin compounds by EPA Method 8270E-SIM

Boat Lift Work Area

Four borings (BLWA-10, -11 -12, -13) were performed to further characterize subsurface conditions in the BLWA.

Ship Rail Work Area

Seven borings (SWRA-8, -9, -10, -11, -12, -14, -15) were completed to 10 feet bgs to better define metals, TPH, and PAH impacts observed along the eastern and southeastern portion of the SWRA.

Above Ground Storage Tank Area

Three borings (AST-2, AST-3, AST-4) were completed to depths ranging approximate 5 to 15 feet bgs near the former AST to refine the extent of TPH impacts. Borings in this area were completed within or closely adjacent to the septic system drain field that is attached to the office/retail building bathrooms.

Shop Floor Drain and Outfall

One boring (SFD-4) was advanced to 15 feet bgs in an area downgradient of the floor drain and MW-1 to further characterize petroleum and metals impacts in close proximity to the drain.

3.3.2 Monitoring Well Installation and Sampling

Three new groundwater monitoring wells (MW-7, MW-8, and MW-9) were installed at the Site (Figure 3-1). Each well location boring was continuously logged to record lithology and determine appropriate screen depth. Wells were screened with a 10-foot screen, with screened depth based on field determination of water table elevation at location. Soil samples were collected at each monitoring well boring in accordance with the procedures described in the RI Work Plan (Leon and CRETE 2022); as - briefly summarized above for the other completed soil borings. Well completion details are provided in Table 3-1. Groundwater gauging data for 2022 to 2024 sampling events are provided in Table 3-2.

Groundwater samples were analyzed by Friedman and Bruya, Inc., Brooks Applied Laboratory and Analytical Resources LLC. Brooks Applied Laboratory provided analysis of total and dissolved metals by EPA Method 1638 which uses inductively coupled plasma dynamic reaction cell mass spectrometry (ICP-DRC-MS) modified using a Closed-Vessel Hotblock Digestion sample preparation. This method allows for low detection limits even with dilution. Groundwater analyses included the following:

- Metals by EPA Methods 6020B and 1638
- PCBs by EPA Method 8082A
- cPAHs by EPA Method 8270D and EPA Method 8270-SIM
- Diesel- and oil-range TPH by NWTPH-Dx extended
- Organochlorine pesticides by EPA Method 8081B
- Dioxins and furans by EPA Method 1613
- Organotin compounds by EPA Method 8270E-SIM

3.3.3 Intertidal Porewater Sampling

In Spring and Summer 2024, attempts were made to sample porewater from the intertidal area immediately downgradient of MW-3, MW-7, and MW-8. The object of this investigation activity was to characterize porewater in the groundwater/surface-water transition zone.

Stainless steel Solinst 615 temporary piezometer sampling devices were installed at three locations downgradient of nearshore wells MW-3 (SPZ-1), MW-7 (SPZ-2), and MW-8 (SPZ-3). The devices had an approximately 5-inch-long screen and were driven into the ground using a post-hole driver just beyond the target depth (2.5 to 3 ft bgs). The piezometers were installed on April 9, 2024 during low tides and sampling efforts were made during subsequent low tides on April 10 and April 11, 2024. A peristaltic pump and silicone tubing were used to pump water from each of the piezometers. At this time, there was insufficient water recovery for sample collection at all three temporary piezometer locations and the devices were removed.

On June 24-26, 2024, additional attempts were made to collect porewater samples in the intertidal shoreline area extending across the BLWA and SRWA. The same methods used for the April 2024 event were repeated at similar locations downgradient of MW-3 (SPZ-1), MW-7 (SPZ-2), and MW-8 (SPZ-3). The piezometers were installed on June 24, 2024 during low tide period and sampling was attempted during low tides on June 25 and June 26, 2024. One water sample was collected from location SPZ-1 on June 25, 2024. Insufficient water was collected from SPZ-2, and SPZ-3. At the completion of this work, the piezometers were left in-place.

On June 30, 2024, intertidal porewater sampling was re-attempted at the three previously installed piezometer locations. At this time, a sample was successfully collected from SPZ-1 using the previously installed piezometer. Sampling from SPZ-2 was unsuccessful and the piezometer device was removed. An open borehole remained after device removal and sample tubing was placed in the borehole 12 to 14 inches bgs. The borehole partially collapsed, but recharge was sufficient to allow for collection of a sample. Because this sample was not obtained using the piezometer device, it was given the unique identification number MP-1. Sampling from SPZ-3 was unsuccessful and the sampling device was removed.

The data obtained from this sampling activity are included along with the upland groundwater data on Table 3-11.

3.3.3 Tidal Study

A tidal study was completed in August 2022 to accomplish the following objectives:

- Determine if the Site monitoring wells are tidally influenced.
- If tidally influenced, estimate tidal lag times for each monitoring well to determine when groundwater sampling should be performed relative to low tide.
- Define net groundwater flow conditions

The tidal study was conducted from August 5-16, 2022 during a time period including negative and non-negative low tides, allowing for observation across a full tidal response. Six monitoring wells and the nearest NOAA-monitored tidal station (ID# 94469880 in Friday Harbor, WA) were used to measure tidal variations. The wells were selected based on distance from the shoreline (within 100 feet of surface water) and to provide coverage from east to west through the Site.

Calculated tidal efficiencies (i.e., magnitude of the tidal fluctuation of groundwater at a monitoring well expressed as a percentage of the tidal fluctuation in the adjacent water body) ranged from 2 percent at

well MW-3 (within the SRWA), to 17 percent at MW-7 (near top of bank within the BLWA). While measured tidal efficiencies were relatively low for all wells, the wells near the top of bank within the BLWA (MW-7, -8 and -9) exhibited the most significant tidal influence (efficiencies ranging 8 to 17 percent). These wells also exhibited the greatest specific conductivity showing influence of marine water. The net groundwater flow direction was determined to be to the north towards the Salish Sea (Figure 3-1). The methods and results of the tidal study are provided in Appendix C.

3.3.4 Data Quality Review

A data quality assurance review was completed for the analyses performed for the 2022 to 2024 investigation activities. The following sections summarize the conclusions of this review.

Sample custody, preservation, holding times, and completeness

The samples were properly preserved and sample custody was maintained from sample collection to receipt at the laboratory. Samples were analyzed within the required method holding times with the following exceptions:

- Soil sample SRWA-11 0-2.5' for EPA Method 8270E.
- Groundwater sample MW8-0623 for EPA Method 8270E-SIM

Laboratory reports were complete and contained results for the samples and analyses requested on the chain-of-custody forms.

Laboratory reporting limits

Laboratory reporting limits were acceptable for the respective laboratory methods.

Method blank analysis

Method blanks were analyzed at the required frequency. In general method blanks did not contain levels of target analytes above the laboratory reporting limits. The following samples were flagged with "B" qualifier for detection of target analyte in associated method blanks:

- Groundwater sample from July 2022 (BLWA-11) for benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene
- Groundwater sample from June 2023 (DUP02-0623) for Dibutyltin ion
- Groundwater samples from June 2023 (MW8-0623, MW4-0623, DUP02-0623, MW9-0623) for 234678-HPCDD and OCDD
- Groundwater sample from September 2022 (MW8) for Phenanthrene
- Groundwater samples from April 2023 (MW1-0423, MW2-0423, MW3-0423, MW4-0423, MW5-0423, MW6-0423, MW7-0423, MW8-0423, MW9-0423, DUP01-0423, DUP03-0423) for OCDD

Matrix spike analysis

Matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within the control limits specified by the laboratory, or method. Matrix spike and matrix spike duplicates failed for analyses of several metals and pesticides, however the laboratory control samples passed acceptance criteria, or analytes were not detected and therefore resulting data are acceptable.

Laboratory duplicate analysis

The relative percent difference (RPD) values or difference values for laboratory duplicate samples met the control limits specified by the laboratory or method.

Field duplicate analysis

Field duplicates were collected at the frequency specified in the QAPP (Leon and CRETE 2022). The RPD for field duplicates were less than 50 percent for all analyses.

Laboratory Data Validation

The laboratory QA/QC data and assigned qualifiers were within acceptable ranges of tolerance, and the analytical data are acceptable for use as described by the data quality objectives.

4. CONCEPTUAL SITE MODEL

This section presents the CSM for the Site which summarizes the physical site characteristics, contaminant sources, fate and transport of contamination, exposure pathways, and potential receptors.

4.1 Habitat Features

The Site is located within Shipyard Cove, a relatively shallow embayment that faces northward on the eastern side of San Juan Island, immediately southeast of downtown Friday Harbor. Topography of the upland area is shown in Figure 2-1b. The shoreline along the active boatyard area is characterized by either vertical structures or steep berms. The eastern side of the property, especially waterward of the former boat building structure, is less developed. The shoreline is composed of fill and debris (e.g., concrete rubble, metal, plastic, wire, treated and untreated wood) with contaminated soil known to exist in the active boatyard areas.

The undeveloped portions of the Site are dominated by open grassy areas; other native vegetation is limited. Native trees and shrubs (a mix of evergreen and deciduous species) are found on the hillside east of the boatyard, near Turn Point Road, and in limited patches along the shoreline. Native plants present include Douglas fir (*Pseudotsuga menziesii*) and Pacific madrone (*Arbutus menziesii*), as well as native rose (*Rosa* sp.) and ocean spray (*Holodiscus discolor*).

4.2 Geology and Hydrogeology

Surface soil in the central portion of the Site (inland of the BLWA and SRWA) generally consists of silty sand or sand-silt mixtures that extend approximately 10 to 15 ft bgs. Closer to the shoreline, soils are coarser, consisting predominantly of sand and gravel. Surface soil in the eastern portion of the Site consists of a shallow layer of sand and gravel (up to approximately 3 ft bgs) that is underlain by silty sand and sand-silt mixtures. Based on boring logs, small areas of silt and clay have also been identified. Geologic cross sections are presented in Figures 4-1 through 4-6.

Evidence of fill materials was observed during the site investigations. In most areas of the Site where fill was observed, it was difficult to differentiate the fill from the native material, suggesting that most of the fill was derived locally, potentially from on-site grading from the southern portion of the site. Significant fill was present in the BLWA where the maximum fill thickness was about 4 to 6 feet near the shoreline. Fill appears to be limited in the SRWA where fill is limited to the upper foot. In the FDA, fill is up to 5 feet thick and contains significant debris but with a limited lateral extent as observed during subsurface investigations and review of the 1941 aerial photograph.

The shallow water bearing zone is present in a gravelly sand unit that consists of both native and fill materials. Groundwater is tidally influenced and the prevailing flow of groundwater is to the north towards the Salish Sea. Based on the results of the tidal study, the average hydraulic gradient is low (0.005 based on MW-2/MW-8) and the average elevation of shallow groundwater across the Site is approximately 6 ft MLLW (Figure 2-3). Slight mounding of groundwater was observed behind the bulkhead at the east side of the BLWA.

4.3 Potential Sources

There are no current releases or ongoing sources of contamination at the Site. Marina operations, including boat maintenance, continue to occur at the Site under best management practices to control potential releases to the environment. The following sections describe physical conditions and potential historical sources for upland subareas.

4.3.1 Ship Rail Work Area

The SRWA includes rail lines east of the pier and the old boat building structure. The SRWA has a lower elevation than the surrounding upland, including high intertidal elevations with abundant pickleweed. This rail lines were used to transport boats during ship building and maintenance which is the likely historical source of contamination in the SRWA. Potential sources of metals include paint stripping operations, and possibly impacted fill used to develop the SRWA. TPH-DRO and cPAH may be associated with historical boat maintenance and drainage of boat bilge water (Shannon & Wilson 2019). Due to topography (the SRWA is at a generally lower elevation), it may have also collected stormwater runoff, soil and debris eroded from adjacent upland areas. There are currently no active operations within the SWRA.

4.3.2 Boat Lift Work Area

The BLWA is an approximately 100-foot-wide area along the shoreline, immediately west of the SRWA and extending west to the western property line. The adjacent shoreline, from west to east, includes a small fill area that projects into the water, a bermed area with an outfall, the boat pullout, an old overwater deck, and the marina pier. Potential sources of metals, TPH-DRO, and cPAHs in this area are similar to those of the SRWA and include paint stripping, paint applications, draining boat bilges, use of treated wood, and possibly impacted fill materials (Shannon and Wilson 2019). Boat maintenance operations are currently conducted in these areas, with best management practices to minimize the potential for contaminant releases.

4.3.3 Former Dumping Area

The FDA is located to the east of the SRWA along the shoreline. This shoreline area was formerly used for dumping of miscellaneous boat parts or debris. Debris observed during investigation activities has included tires, plastic, metal parts, two engine blocks, hoses, cables, a large battery, and other metal and wood debris. No sheen or staining has been noted in the FDA. A former cabin was located about 50 feet east of the FDA and a former oil shed was located adjacent to the FDA. The former owner indicated that the shed contained 300-gallon gasoline and diesel ASTs and a 300-gallon waste oil tank. During the Phase 1 ESA a waste oil AST along with several smaller diesel, gasoline, and waste oil drums were observed. No evidence of spills or overtopping were noted in or around the building and concrete flooring was present throughout the shed for containment in the event of a spill (Whatcom 2017).

To the south and southeast of the FDA is a large grassy area that formerly included a residence. A water well may be present near the southern edge of the grassy area but no well information was provided in previous documents. A UST was also formerly located near the western edge of the grassy area. Based on the Phase 1 ESA, the former UST was used to fuel equipment and was removed in the late 1990's. The former owner indicated that the former UST contained gasoline. Soil and groundwater sampling in this area suggest that no contamination is present.

4.3.4 Former Above Ground Storage Tank

A former AST may have been located south of the central former shop building. There is no documentation regarding the size or contents of the former AST. Soil sampling results suggest that the AST may have contained a heavier fuel such as heating oil.

4.3.5 Shop Floor Drain

The shop building was described as a machine shop building in previous Site documents, indicating potential presence of lubricants and cleaning solvents. A 3-inch diameter floor drain is present near the northwest corner of the building. The drain was used to dispose of liquids. Prior investigations indicate the drain appeared to flow to a holding tank or drum underground. The former owner noted that the

tank or drum may have been perforated or may have contained a drain line for the contents to drain, but the destination of the contents was unclear. The Port advanced a scope into the shop drain in November 2025 and identified a partial metal drum with no apparent pipe outlets or perforations. A sample of material collected from the drain contained TPH-Dx and metals (arsenic, cadmium, chromium, copper, lead, mercury, zinc) at concentrations exceeding the PCULs. Tetrachloroethene was detected at a concentration below the most stringent PCUL (Table 3-8).

4.3.6 Former Orcas Power and Light Company Pad

The former OPALCO storage area is located in the western portion. The pad is the building foundation of an OPALCO building that burnt down on April 25, 2010, possibly contributing to cPAHs. The San Juan Island Fire Department incident report indicated that no hazardous materials were present at the time of the fire. Shipyard activities, paint-stripping, and stored creosote-treated wood are possible sources of contamination.

4.4 Transport Pathways

The following sections discuss potential release and transport mechanisms of these contaminants.

4.4.1 Soil

Infiltration of stormwater may leach contaminants from the vadose zone (primarily the upper 1 to 2 feet of soil) to groundwater. In addition, exposed surface soil near the shoreline may release contamination to marine sediment and surface water through erosion. During the regional dry season, exposed soil may be released to marine sediment and surface water as dust.

4.4.1 Groundwater

The hydraulic gradient of groundwater is toward surface water (Shipyard Cove). Impacted groundwater may discharge to the Cove, potentially impacting marine sediment and surface water.

4.5 Potential Receptors

Ecological and human receptors could be directly or indirectly exposed to contaminants in soil, sediment, and surface water as follows:

- Ecological – See Section 5.1.3 for Terrestrial Ecological Evaluation Exemption
- Ecological – Organisms using the Site for habitat, including benthic invertebrates, fish, birds, and mammals
 - Direct exposure – Contact with or ingestion of pore water, surface water, or sediment
 - Indirect exposure – Consumption of benthic invertebrates or fish
- Human – People using Site for recreation or food, including fishermen (tribal and recreational) and kayakers
 - Direct exposure – Incidental ingestion or dermal contact with sediment, soil, or surface water
 - Indirect exposure – Consumption of seafood
- Human – Workers performing Site improvements
 - Direct contact with or ingestion of soil – Direct contact (incidental ingestion and dermal contact) could occur in areas where soil is exposed, such as on the bank, or where soil could become exposed during construction.
 - Direct contact with or ingestion of groundwater – Direct contact (incidental ingestion and dermal contact) could occur in areas where groundwater becomes exposed during construction.

These receptors and exposure pathways are evaluated in Section 5.1.

5. PRELIMINARY CLEANUP STANDARDS

This section identifies exposure pathways applicable to the Site upland and preliminary cleanup levels (PCULs) for upland soil and groundwater.

5.1 Upland Soil Exposure Pathways

5.1.1 Human Health

Boat owners, trespassers, and other public users of the property may be exposed to surface soil through incidental contact or dust. Boatyard workers may be exposed to surface soil through incidental contact or dust. Site construction workers may be exposed to soil and, groundwater during earthwork activities, such as utility installation or cleanup action construction, due to incidental contact or dust.

Exposures for each of these scenarios are anticipated to be incidental but the exposure pathway is complete. Personal protective equipment used by boatyard workers may help mitigate exposure. Similarly, construction workers will use personal protective equipment during earthwork to protect from the types and concentrations of contaminants that are present. Preliminary cleanup levels developed for the Site (Table 4-1) address these exposure pathways.

5.1.2 Ecological Health

The Site consists of riparian and intertidal habitat that bird species are expected to utilize. Bird species would be exposed to chemicals through incidental ingestion and direct contact with Site soil while consuming prey. Similarly, semi-aquatic terrestrial mammals like raccoon, muskrat, and river otter may be present on Site or in the vicinity are also expected to be exposed to chemicals through incidental ingestion of and direct contact with Site soil. These exposure pathways are expected to be incidental due to the low habitat quality at and adjacent to the Site. No bird or mammal surveys have been performed at the Site.

5.1.2.1 Terrestrial Ecological Evaluation

MTCA includes procedures for performing a Terrestrial Ecological Evaluation (TEE) to characterize existing or potential threats to terrestrial plants or animals exposed to hazardous substances in soil. The Site does not meet any of the exclusions from conducting a TEE. However, the Site also does not meet the criteria for performing a site-specific TEE. Therefore, a simplified TEE was performed in accordance with the procedures in WAC 173-340-7492.

The site is zoned rural industrial and therefore only potential exposures to wildlife (e.g., small mammals, birds) need to be considered [WAC 173-340-7492(2)(b)]. The simplified TEE consists of three steps: 1) exposure analysis, 2) pathways analysis, and 3) contaminants analysis. The exposure and pathways analyses concluded there are complete pathways by which soil biota, plants or wildlife may be exposed to soil contamination. Therefore, a contaminant analysis was performed in which soil chemistry data was compared to the concentrations listed in MTCA Table 749-2 for priority contaminants of ecological concern. For the purposes of the TEE, only soil collected within six feet of the surface was considered.

All applicable soil chemistry data were first evaluated to determine whether the maximum detected concentrations of any hazardous substance exceeded the values for an industrial or commercial site listed in MTCA Table 749-2. Arsenic, copper, dioxin toxicity equivalent (TEQ), furan TEQ, lead, mercury, and zinc have maximum concentrations that exceed the TEE criteria and therefore were identified as chemicals of potential ecological concern. Many detected chemicals, particularly polycyclic aromatic hydrocarbons (PAHs) do not have values in Table 749-2. However, the maximum concentration of the one PAH with a value in that table, benzo(a)pyrene, was less than 1% of the screening value and it is unlikely that any of the other PAHs represent an ecological concern for terrestrial wildlife at this site.

The chemicals identified as chemicals of potential ecological concern were further evaluated using statistical techniques. Upper confidence limits (UCLs) on the mean concentrations were calculated using ProUCL (v5.1) software. Only five samples were analyzed for dioxins and furans, which is not enough data to calculate reliable UCLs.

The 95% UCLs for copper and lead were above the values in MTCA Table 749-2, but the UCLs for arsenic, mercury, and zinc were not. Additional evaluation of individual results was conducted in consideration of MTCA requirements for compliance monitoring. None of the arsenic and mercury concentrations exceeded the Table 749-2 values by more than two times and less than 10% of the results exceeded the Table 749-2 values. Therefore, arsenic and mercury are not considered to be chemicals of ecological concern. Several zinc results exceeded the Table 749-2 value by more than two times, so zinc is still considered to be a chemical of ecological concern, along with copper, lead, and dioxins/furans.

Based on the results of this simplified TEE, the numeric criteria from MTCA Table 749-2 have been incorporated into the PCULs for this Site (Table 5-1) and were used to evaluate soil contaminant concentrations within the top six feet of soil at the Site (Section 6). The simplified TEE is included as Appendix D.

5.2 Highest Beneficial Use of Site Groundwater

The WAC 173-340-720(1)(a) states that, “Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future Site use conditions.” It is proposed that groundwater within the Site is classified as non-potable in accordance with WAC 173-340-720(2), as follows:

- Neither the Site nor groundwater in its vicinity is a current source of drinking water.
- Under WAC 173-340-720(2)(b), neither the Site nor groundwater in its vicinity is a potential future source of drinking water because groundwater contains natural background levels of specific conductivity above the state and local secondary maximum contaminant level of 0.7 milliSiemens/centimeter (mS/cm) (WAC 246-290-310(3)(a) and San Juan County code 8.06.260.
- Site groundwater will not migrate into groundwater that is a current or potential source of drinking water
- A domestic supply well would not be placed in the vicinity of the Site (WAC-173-340-720(2)(d)). State and local codes prohibit the construction of drinking water wells in the vicinity of the Site via WAC 246-290-130(1) which requires drinking water supplies to come from the highest quality source (which at the Site is the municipal water supply system) and via WAC 290-135(2)(b) which specifies a minimum 100-foot drinking water well setback from surface water, roads, utilities, and buildings.

In summary, groundwater is not currently used as a drinking water source and is not suitable for future use as a potential source because of existing saline conditions. In addition, pumping of groundwater may cause further saline water intrusion into the groundwater zones beneath the Site. Based on this evaluation, the highest beneficial use of groundwater is protection of surface water.

5.3 Upland Soil and Groundwater PCULs

Based on the consideration of exposure pathways, soil PCULs include the following criteria obtained from the January 2025 version of the MTCA CLARC Tables:

- MTCA Method B Direct Contact values cancer and non-cancer endpoints
- Criteria protective of vadose zone soil leaching to marine surface water and sediment via groundwater

- Criteria for simplified TEEs for industrial/commercial land use for priority contaminants of ecological concern

In addition, chemical concentrations in surface soil were compared to MTCA SMS Sediment Cleanup Objective (SCO) values to evaluate transport of contaminated surface soil to marine sediment via erosion. It is noted that TEE criteria are generally less stringent than the other criteria that have been identified for this Site. The selected PCUL for each chemical analyte (Table 5-1) represents the most stringent value, adjusted as needed based on natural background concentrations and/or practical quantitation limits (PQLs).

Based on the proposed classification of groundwater as non-potable (Section 4.1), the following PCULs are proposed for groundwater for protection of surface water:

- State and federal criteria for protection of human health (marine surface water)
- State and federal criteria for protection of aquatic life (marine surface water)

Groundwater PCULs are summarized on Table 5-2.

5.3 Points of Compliance

Points of compliance for upland soil and upland groundwater are identified to inform this RI and will be used to evaluate remedial alternatives in the FS. In this RI, the soil point of compliance for protection of groundwater is throughout the Site. The protection of direct contact exposure is throughout the Site to a depth of 15 feet bgs. The conditional point of compliance in groundwater is at the point of discharge to surface water

6. NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of contamination in upland soil and groundwater and the development of Site Indicator Hazardous Substances (IHSs).

6.1 Soil and Groundwater Contaminants of Interest

Indicator hazardous substances (IHSs) are defined by WAC 173-340-200 as a subset of hazardous substances present during any phase of remedial action for the purpose of characterizing the site or establishing cleanup requirements for that site. For the purposes of the RI/FS for this Site, the IHSs are the contaminants for which the effectiveness of remedial alternatives will be evaluated in the FS. For this RI, the first step in developing IHSs was to first develop a list of Constituents of Interest (COIs). COIs were selected based on having at least one detected value exceeding the most stringent PCUL.

The identified soil COIs (Table 6-1) are:

- cPAH Total Toxic Equivalent Concentration (TEQ)
- Dioxins/Furans
- Metals
 - Arsenic
 - Cadmium
 - Chromium
 - Copper
 - Lead
 - Mercury
 - Zinc
- Pesticides
 - Dichlorodiphenyldichloroethane (DDD)
 - Dichlorodiphenyltrichloroethane (DDT)
- TPH-Dx
- Total PCB Aroclors
- Tributyltin (TBT)

Groundwater COIs (Table 6-2) are:

- cPAH Total Toxic Equivalent Concentration (TEQ)
- Dioxins/Furans
- Metals
 - Arsenic
 - Cadmium
 - Chromium
 - Copper
 - Lead
 - Mercury
 - Nickel
 - Zinc
- Tributyltin (TBT)

6.2 Indicator Hazardous Substances

IHSs in the upland area were determined based on frequency and magnitude of PCUL exceedances of COIs in upland soil and groundwater. Tables 3-2 through 3-6 provide a summary of Site upland soil and groundwater COIs, including the following parameters for each detected constituent by media:

- Number of sampled locations and number of samples
- Number of detections
- Detection frequency (number of detections / total number of samples)
- Maximum detected concentration
- Frequency of exceedance (number of exceedances / total number of samples)
- Maximum magnitude of exceedance (maximum detected concentration / screening level)

In accordance with WAC 173-340-703(2), the following approach was considered in this RI to guide selection of IHSs:

*(2) **Approach.** If the department considers this approach appropriate for a particular site, the factors evaluated when eliminating individual hazardous substances from further consideration shall include:*

- (a) The toxicological characteristics of the hazardous substance that influence its ability to adversely affect human health or the environment relative to the concentration of the hazardous substance at the site, including consideration of essential nutrient requirements;*
- (b) The chemical and physical characteristics of the hazardous substance which govern its tendency to persist in the environment;*
- (c) The chemical and physical characteristics of the hazardous substance which govern its tendency to move into and through environmental media;*
- (d) The natural background concentrations of the hazardous substance;*
- (e) The thoroughness of testing for the hazardous substance at the site;*
- (f) The frequency that the hazardous substance has been detected at the site; and*
- (g) Degradation by-products of the hazardous substance.*

6.2.1 Metals

Extensive soil and groundwater sampling and analysis for metals has been performed. Copper is the most prevalent metal COI in soil and groundwater. Copper exceeds the PCUL for the protection of marine surface water (adjusted to background concentration of 36 milligrams per kilogram [mg/kg]) at 57 locations, with exceedances mostly focused within the BLWA and SRWA. At four of these locations in the BLWA, concentrations of copper exceeds MTCA Method B criteria for protection of human health (3,200 mg/kg) with concentrations ranging 3,500 to 9,300 mg/kg; three of these exceedance are in surface soil (0 to 6 in bgs) and the fourth is from 2 ft bgs. Copper also exceeds TEE criteria for industrial Sites (220 mg/kg) in surface soil at 18 of these locations.

Arsenic, mercury, and zinc show a similar pattern with soil and groundwater impacts (predominantly exceedances of the PCULs for protection of marine surface water) concentrated in surface soil within the BLWA and SRWA. The following summarizes selection of these metals as IHSs:

- Arsenic exceedances are co-located with copper except for two samples: SRWA-4 at 3.5' and MW-4 at 11'. Therefore, Arsenic is only an IHS at locations SRWA-4 and MW-4.
- Mercury exceedances are co-located with copper except one sample (SRWA-13 at 3-5'). Therefore, mercury is an IHS only at location SRWA-13.

- Zinc exceedances are co-located with copper exceedances except for three samples (FDA-3 at 2.5', TP-5, and TP-6). Therefore, zinc is an IHS only at locations FDA-3, TP-5, and TP-6.

Nickel exhibits a similar pattern to arsenic, mercury and zinc in Site groundwater (PCUL exceedances focused in/near the BLWA and SRWA), however there are no exceedances in available soil data. Nickel has not been retained as an IHS.

Cadmium exceeds the soil PCUL for protection of marine surface water (1.1 mg/kg) at six locations within the BLWA and SRWA. There are also two exceedances in surface soil near the shop floor drain and OPALCO Pad and a deeper exceedance (5 to 7 ft bgs) at the AST. For chromium, there are no exceedances of PCULs except for the sample collected from within the shop floor drain. The exceedance frequency of cadmium and chromium in Site groundwater are lower than other metals (exceedances in 5 percent or less of the total number of samples). Also, cadmium and chromium are co-located with exceedances of copper and, therefore, have not been retained as IHSs.

Lead exceeds the PCUL based on industrial site TEE criteria (220 mg/kg) at 18 locations, and leaching pathway criteria for protection of surface water at just 1 location. While lead is co-located with copper, exceedances are driven by the TEE and human health criteria instead of the marine surface water pathway. Therefore, lead has been retained as an IHS.

Available soil and groundwater data for all metals are summarized in Tables 3-3 and 3-11, respectively. The distribution in soil and groundwater of arsenic, copper, mercury, and zinc is illustrated in Figures 6-1 through 6-5.

6.2.2 Petroleum

TPH-G has been analyzed in 26 soil samples, but has only been detected at 3 locations (AST-4, BLWA-10, and MW-1) at concentrations (37, 7, and 32 mg/kg, respectively) below the most stringent PCUL (100 mg/kg). Benzene, toluene, ethylbenzene, and xylenes (BTEX) have not been detected at the Site. TPH-Dx (sum of diesel and oil range TPH) has been analyzed in 80 samples. TPH-Dx was detected at concentrations exceeding the most stringent PCUL (2,000 mg/kg) in soil at three locations and only in soil up to 5 ft bgs (Table 3-3). TPH-Dx also exceeds the PCUL in one sample that was collected directly from the shop floor drain (SFD-3); these data reflect concentrations in drain solids, not soil. TPH-Dx has not been detected at concentrations above applicable PCULs in Site groundwater (Table 3-11). TPH-Dx has been retained as an IHS. The distribution of TPH-Dx in soil and groundwater is illustrated in Figure 6-6.

6.2.3 Carcinogenic Polycyclic Aromatic Hydrocarbons

Extensive soil sampling and analysis for PAHs has been performed. CPAH TEQ exceeds applicable PCULs in both soil and groundwater (Tables 3-5 and 3-11). CPAH TEQ exceedances are widespread in soil up to 5 ft bgs, with vadose zone impacts focused in the BLWA and SRWA (Table 3-5). CPAHs have not been detected at concentrations above the PCULs in groundwater (Table 3-11). CPAHs have been retained as Site IHS. The individual cPAH benzo(a)pyrene has not been retained. The distribution of cPAHs in soil and groundwater is illustrated in Figure 6-7.

6.2.4 Tributyltin

Soil at six locations within the BLWA and SRWA have been analyzed for organotins. Tributyltin (TBT) has been detected above the soil PCUL for the protection of marine surface water (adjusted to the PQL) at

four of these locations (Table 3-4). TBT has also been detected in groundwater in the BLWA at concentrations exceeding the PCUL. TBT is commonly associated with boat maintenance (e.g., anti-fouling paint) and therefore has been retained as a Site IHS. The distribution in soil and groundwater is illustrated in Figure 6-8.

6.2.5 Polychlorinated Biphenyls

PCB Aroclor data have been collected at 17 locations within the BLWA and SRWA, including five locations within and adjacent to the footprint of the former OPALCO building. Soil at six locations, at depths up to 5 ft bgs, exceed the PCUL based on MTCA Method B for protection of human health (Table 3-4). There were no detections of PCBs in groundwater (Table 3-11). While PCBs in surface soil are co-located with metals exceeding both direct-contact and leaching pathway PCULs, because they are an organic compound and may require a different remedial technology than metals, PCBs have been retained as IHSs for the RI/FS. The distribution of PCBs in soil and groundwater is illustrated in Figure 6-9.

6.2.6 Dioxins/Furans

Dioxins/furans data have been collected at seven locations within the BLWA and SRWA. Soil concentrations of dioxins/furans [evaluated as total 2,3,7,8-TCDD equivalence (TEQ)] exceeded direct-contact and leaching pathway PCULs (both adjusted to the PQL; Table 3-4) at five locations. Dioxins/furans were also detected at concentrations above the PCUL (adjusted to the PQL) in Site groundwater (Table 3-10). Similar to metals, the impacts are focused in the BLWA and SRWA. Dioxin/furans have been retained as an IHS. The distribution of PCBs in soil and groundwater is illustrated in Figure 6-10.

6.2.7 Pesticides

Soil at six locations within the BLWA and SRWA have been analyzed for full suite of pesticides. DDD and DDT were detected above PCULs for protection of marine surface water at only one location (Table 3-7). Neither compound was detected in groundwater. DDT has been retained as a Site IHS. Cleanup alternatives for DDT will address DDD, therefore DDD has not been retained.

6.2.8 Volatile Organic Compounds

Soil at two locations was analyzed for volatile organic compounds. Sample Shop Floor Drain-3 (SFD-3) was collected directly from within the floor drain in the shop building. Tetrachloroethylene (PCE) was detected in SFD-3 at a concentration (0.017 mg/kg), lower than the most stringent PCUL for protection of marine surface water (0.029 mg/kg). Sample SRWA-3 was collected from the intertidal area within the SRWA. Six VOCs were detected in this sample (Table 3-8) at concentrations below the most stringent PCULs. VOCs are not retained as IHSs for this Site.

6.2.9 Other Semi-Volatile Organic Compounds

Soil at one location was analyzed for semi-volatile organic compounds. The sample collected directly from within the floor drain in the shop building [Shop Floor Drain-3 (SFD-3)] was also analyzed for semi-volatile compounds. CPAH results are discussed in Section 6.2.5 above. Excluding cPAHs, five other SVOCs were detected in SFD-3 at concentrations exceeding the most stringent PCUL (benzyl alcohol, 2-methylphenol, 3&4 methylphenol, 2-4 dimethylphenol, bis-(2-ethylhexyl) phthalate). One SVOC compound, excluding cPAHs, was detected at SRWA-1 in surface soil (3 to 6 inches bgs) at

concentrations exceeding the most stringent PCUL (dimethylphthalate). These other SVOCs are co-located with exceedances of other compounds and therefore not retained as IHSs.

7. REMEDIAL INVESTIGATION CONCLUSIONS

The Site has had over 100 years of industrial uses that contributed to legacy contamination. Historical shipyard activities represent the primary source of contamination, including the application and removal of antifouling paints, mechanical, and general maintenance work both over water and land, and treatment of wooden boats using pesticides. A former underground gasoline storage tank, a machine shop used for hazardous chemical storage, a small dump area, and a marine railway also represent historical sources.

Based on the investigation activities described in this report, the proposed IHSs for the Site are metals (i.e., arsenic, copper, mercury, nickel, zinc), TPH-Dx (soil only), PCBs, dioxins/furans, cPAHs, and TBT. The IHSs will be used to develop and evaluate the effectiveness of remedial alternatives in the FS, however, the FS will also consider the extent of all COIs at the Site. Based on the results summarized in this RI, chemicals exceeding PCULs in upland soil and groundwater generally coincide with boat maintenance areas (i.e., BLWA, SRWA). In these areas, the highest concentrations of contaminants are found within the top 1 foot of soil (Figures 6-1 through 6-7). Based on this, stormwater infiltration and leaching of contaminants (particularly metals) from vadose zone soil (primarily the upper 1 foot of soil) to groundwater is a key transport pathway to evaluate in the FS. To further illustrate this, Table 7-1 shows the observed distribution of copper and zinc in soil and groundwater in representative locations in the BLWA. TPH-Dx has only been observed at concentrations exceeding the PCUL in vadose zone soil. However, it has not been detected in groundwater and its presence in soil is isolated to a couple locations in the BLWA and SRWA where draining of bilge water and other boat maintenance may have occurred and several locations close to the shop building where storage of lubricants and other materials may have occurred.

7.1 Data Sufficiency

The data and information presented in this RI Report was reviewed to assess sufficiency of the data for completing the next step in the Site cleanup process: the FS. Figures 7-1 and 7-2 have been prepared to provide a combined illustration of lateral and vertical extents of PCUL exceedances for the two most prevalent IHSs, copper and zinc. In addition, Figure 7-3 was prepared to provide a combined illustration of lateral and vertical PCUL exceedances for all site IHSs. Based on these figures, the lateral extent of contamination has been well characterized. In some locations, the vertical extent of IHSs exceeding PCULs has not been fully characterized. However, these figures do show that the majority of exceedances are within surface soil (upper 1-foot bgs) and clearly show a decline in concentration with respect to depth. The existing data and conceptual site model provide sufficient understanding of contaminated media and exposure pathways of concern and, importantly, are sufficient to complete the following key FS tasks:

1. Delineate areas requiring remediation
2. Identify remedial technologies applicable to Site COIs and physical conditions
3. Assemble an appropriate range of remedial alternatives
4. Develop feasibility level cost estimates for the disproportionate cost analysis

Additional data is expected to be required to support remedial design including chemistry data that will provide a more detailed understanding of the vertical extent of contamination, where needed.

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Tables

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Table 3-1. Monitoring Well Construction Details
Jensen's Shipyard and Marina
Port of Friday Harbor

Well ID	Construction Date	Well Tag ID	Well Diameter (inches)	Type	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Total Well Depth (ft bgs)	Lid Elevation (ft MLLW)	Top of PVC Elevation (ft MLLW)	Northing (NAD 83)	Easting (NAD 83)
MW-1	7/30/2018	BKF-620	2	Flush Mount	4.5	14.5	15	14.27	13.87	563866.164	1115539.121
MW-2	7/30/2018	BKF-621	2		4.5	14.5	15	11.77	11.31	563927.765	115534.623
MW-3	8/1/2018	BKF-625	2	Decommissioned	3	12.5	13	10.47	10.16	563889.166	1115676.466
MW-4	7/21/2018	BKF-622	2	Flush Mount	4.5	14.5	15	13.77	13.37	563970.725	1115384.588
MW-5	8/1/2018	BKF-624	2		4.5	14.5	15	16.67	16.36	563912.345	1115827.778
MW-6	7/31/2018	BKF-623	2		29	39	39.5	34.77	34.16	563762.497	1115680.988
MW-7	7/27/2022	BPK-577	2		2.6	12.6	12.8	11.05	10.76	564026.750	1115475.080
MW-8	7/28/2022	BPK-578	2		2.6	12.6	12.8	11.56	11.24	563989.710	1115557.750
MW-9	7/27/2022	BPK-576	2		1.6	11.6	11.8	11.52	11.25	563977.800	1115646.030

Abbreviations:

bgs - feet below ground surface

ft - feet

MLLW = feet mean low low water

Table 3-2. Monitoring Well Gauging Data
Jensen's Shipyard and Marina
Port of Friday Harbor

Well ID	MW-1		MW-2		MW-3 ¹		MW-4		MW-5		MW-6		MW-7		MW-8		MW-9	
Top of PVC (ft MLLW)	13.87		11.31		10.16		13.37		16.36		34.16		10.76		11.24		11.25	
Total Well Depth (ft bgs)	15		15		13		15		15		40		13		13		12	
Dates of Gauging Event	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)	Depth to Water (ft BTOC)	Elevation (ft MLLW)
8/5/2022	8.1	5.77	5.8	5.51	4.34	5.82	8.01	5.36	10.45	5.91	28.52	5.64	6.05	4.71	5.9	5.34	5.85	5.4
8/16/2022	7.89	5.98	5.59	5.72	4.15	6.01	7.79	5.58	10.34	6.02	--	--	5.43	5.33	5.68	5.56	5.6	5.65
9/6/2022-9/8/2022	8.22	5.65	8.86	2.45	4.65	5.51	8.22	5.15	10.80	5.56	28.60	5.56	6.28	4.48	5.89	5.35	5.75	5.5
12/6/2022-12/8/2022	7.89	5.98	5.56	5.75	3.61	6.55	7.90	5.47	10.06	6.30	28.35	5.81	5.70	5.06	5.35	5.89	5.50	5.8
4/11/2023-4/12/2023	7.81	6.06	5.35	5.96	3.60	6.56	7.81	5.56	9.55	6.81	28.05	6.11	5.50	5.26	5.60	5.64	5.40	5.9
6/5/2023-6/7/2023	8.01	5.86	5.66	5.65	4.10	6.06	8.10	5.27	10.30	6.06	28.29	5.87	5.70	5.06	5.55	5.69	4.96	6.3
9/25/2023-9/27/2023	8.09	5.78	5.50	5.81	4.40	5.76	7.90	5.47	10.61	5.75	28.51	5.65	5.41	5.35	5.52	5.72	5.39	5.9
12/12/2023-12/14/2023	7.40	6.47	5.23	6.08	3.35	6.81	7.64	5.73	6.63	9.73	27.87	6.29	5.33	5.43	5.13	6.11	4.73	6.5
4/9/2024-4/11/2024	7.90	5.97	5.80	5.51	--	--	7.90	5.47	9.68	6.68	28.06	6.10	5.96	4.80	5.90	5.34	5.77	5.5
6/24/2024-6/26/2024	7.98	5.89	5.63	5.68	--	--	8.03	5.34	10.38	5.98	28.38	5.78	5.85	4.91	5.45	5.79	5.25	6.0

Notes and Abbreviations:

bgs - below ground surface

BTOC - below top of casing

ft - feet

MLLW - mean lower low water

Note:

1. MW-3 was damaged prior to April 2024 quarterly monitoring event.

Table 3-3. Summary of Uplands Soil Data – Total Petroleum Hydrocarbons and Metals
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	TPH (mg/kg)				BTEX (mg/kg)				Metals (mg/kg)							
		NWTPH-Gx	NWTPH-Dx Diesel Range	NWTPH-Dx Oil Range	Total Dx (Diesel + Oil)	Benzene	Toluene	Ethylbenzene	Xylenes	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Ship Rail Work Area (SRWA)																	
SRWA-1 3-6in	1/24/2018	NA	180	1100	1,280	NA	NA	NA	NA	30	0.54	29	2,400	920.0	13	NA	840
SRWA-6 2-6in	8/1/2018	NA	120	640	760	NA	NA	NA	NA	16	0.64	36	220	1200.0	2.8	NA	1,100
SRWA-6 3ft	8/1/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	5	0.21 U	20	11	11.0	0.02 U	NA	32
SRWA-7 2-6in	8/1/2018	NA	170	690	860	NA	NA	NA	NA	9.1	2.6	25	920	160.0	0.23	NA	400
SRWA-7 3ft	8/1/2018	NA	40	230	270	NA	NA	NA	NA	4.3	0.38	19	63	110.0	0.1	NA	140
MW-3 2-6in	8/1/2018	NA	25 U	280	280	NA	NA	NA	NA	13	0.74	29	400	190	1.3	NA	310
MW-3 5.5ft	8/1/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	5.6	0.21 U	28	82	25	0.16	NA	110
SRWA-8 0-1'	7/26/2022	5 U	50 U	360	360	NA	NA	NA	NA	7.14	1 U	10.4	87.3	49.9	0.30	NA	79.1
SRWA-8 2-3'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.62	1 U	20.4	12.6	3.0	0.1 U	NA	20.3
SRWA-8 4-5'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.93	1 U	21.1	26.8	3.2	0.1 U	NA	36.1
SRWA-9 2.5-5'	7/26/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.94	1 U	7.78	8.32	2.2	0.1 U	NA	18.6
SRWA-10 3-5'	7/28/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	6.30	1 U	12.1	34.1	16.1	0.1 U	NA	51.7
SRWA-10 5-7.5'	7/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.71	1 U	12.2	14.3	2.7	0.1 U	NA	35.5
SRWA-11 0-2.5'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.24	1 U	16.8	69.3	75.0	0.15	NA	105
SWRA-12 0-1'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SRWA-12 2-3'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SRWA-12 4-5'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SRWA-14 0-1'	7/26/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.91	1 U	5.13	59.1	115.0	0.30	NA	52.4
SRWA-14 1-2'	7/26/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.30	1 U	6.96	14.3	2.6	0.1 U	NA	28.7
Boat Lift Work Area (BLWA)																	
BLWA-1 0-3in	1/24/2018	NA	160	470	630	NA	NA	NA	NA	12	1.3	35	6,700	700.0	0.81	NA	950
BLWA-2 0-3in	1/24/2018	NA	170	300	470	NA	NA	NA	NA	7.1	0.94	20	6,100	350.0	0.39	NA	1,700
BLWA-3 2-6in	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.5	0.2	28	180	150.0	0.032	NA	99
BLWA-3 2ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3	0.2 U	15	32	3.0	0.028	NA	29
BLWA-4 2-6in	7/30/2018	NA	25 U	81	81	NA	NA	NA	NA	5.2	0.43	21	680	150.0	0.17	NA	260
BLWA-4 5ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.9	0.19 U	17	86	540.0	0.18	NA	110
BLWA-5 2-6in	7/30/2018	NA	91	180	271	NA	NA	NA	NA	10	0.81	29	1,100	270.0	0.36	NA	390
BLWA-5 2ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.1	0.19 U	15	28	3.2	0.038	NA	31
BLWA-6 2-6in	7/30/2018	NA	95	260	355	NA	NA	NA	NA	9.7	1.2	31	9,300	760.0	1.1	NA	1,400
BLWA-6 2ft	7/30/2018	NA	350	710	1,060	NA	NA	NA	NA	150	2.6	78	3,500	3400.0	0.31	NA	3,800
BLWA-6 5ft	7/30/2018	3 U	1,400	940	2,340	0.03 U	0.05 U	0.05 U	0.02 U	3.7	0.19 U	18	84	560.0	0.11	NA	72
BLWA-6 10 ft	7/30/2018	3 U	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	4.6	0.19 U	11	20	1.9	0.02 U	NA	47
BLWA-7 2-6in	7/30/2018	NA	25 U	180	180	NA	NA	NA	NA	13	1.8	30	2100	340.0	0.92	NA	630
BLWA-7 2ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.7	0.19 U	21	50	3.0	0.02 U	NA	39
BLWA-7 5ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BLWA-8 2-6in	7/30/2018	NA	25 U	56	56	NA	NA	NA	NA	5.1	0.48	19	1100	470.0	0.18	NA	350
BLWA-8 2ft	7/30/2018	NA	25 U	290	290	NA	NA	NA	NA	6.2	0.23	23	170	200.0	0.12	NA	110
BLWA-8 5ft	7/30/2018	NA	25 U	98	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BLWA-9 2-6in	7/30/2018	NA	61	160	221	NA	NA	NA	NA	5.7	0.96	25	2900	310.0	1.5	NA	690
BLWA-9 2ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.3	0.19 U	18	49	11.0	0.048	NA	92
BLWA-9 5ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2 6in	7/30/2018	NA	32	160	192	NA	NA	NA	NA	7.2	2.3	27	2,100	230.0	0.64	NA	540
MW-2 7ft	7/30/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	6.2	0.67	12	24	29.0	0.024	NA	37
BLWA-10 0-1'	7/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.70	1 U	11.4	350	73.3	0.1 U	NA	92.7
BLWA-10 3-5'	7/28/2022	7.0	50 U	250 U	ND	NA	NA	NA	NA	5 U	1 U	16.3	54.2	98.1	0.1 U	NA	58.5

Table 3-3. Summary of Uplands Soil Data – Total Petroleum Hydrocarbons and Metals
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	TPH (mg/kg)				BTEX (mg/kg)				Metals (mg/kg)							
		NWTPH-Gx	NWTPH-Dx Diesel Range	NWTPH-Dx Oil Range	Total Dx (Diesel + Oil)	Benzene	Toluene	Ethylbenzene	Xylenes	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
BLWA-10 5-6'	7/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.41	1 U	8.90	112	94.1	0.1 U	NA	65.3
BLWA-11 0-2.5'	7/25/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.83	1 U	10.8	125	42.3	0.16	NA	101
BLWA-11 2.5-5'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.05	1 U	6.23	18.1	3.6	0.1 U	8.59	16.7
BLWA-11 5-7'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.99	1 U	15.8	150	181.0	NA	NA	67.9
BLWA-12 0-2'	7/25/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	6.84	1 U	17.0	629	147.0	0.80	NA	291
BLWA-12 3-5'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.66	1 U	14.4	82.0	31.4	0.20	NA	58.8
BLWA-12 5-7'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.32	1 U	15.1	36.8	8.7	0.1 U	10.3	25.2
BLWA-13 0-2'	7/27/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	3.48	1 U	9.97	295	57.8	0.28	NA	140
BLWA-13 3-5'	7/27/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.85	1 U	8.82	20.9	1.8	0.1 U	NA	17.9
MW-7 2-3'	7/27/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.59	1 U	8.50	15.9	1.8	0.1 U	NA	18.0
MW-7 3-5'	7/27/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	1.98	1 U	8.82	18.5	5.5	0.1 U	NA	54.1
MW-7 10-11'	7/27/2022	NA	NA	NA	NA	NA	NA	NA	NA	4.01	1 U	10.3	39.3	70.8	0.1 U	13.7	61.9
MW-8 4-5'	7/28/2022	5 U	61 x	440	440	NA	NA	NA	NA	2.08	1 U	10.4	58.3	64.9	0.23	NA	156
MW-8 5-7'	7/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.44	1 U	9.43	43.6	2.5	0.1 U	NA	31.6
MW-9 0-2.5'	7/27/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.59	1 U	8.69	173	35.0	0.12	NA	83.4
MW-9 2.5-5'	7/27/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.21	1 U	4.60	24.1	5.2	0.1 U	NA	32.4
MW-9 5-7'	7/27/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.29	1 U	7.63	80.7	165.0	0.22	7.33	67.4
Former Dumping Area (FDA)																	
FDA-1 2ft	1/24/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.5	0.5 U	41	16	6.4	0.028	NA	30
FDA-2 0-6in	1/24/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	8.7	0.5 U	21	79	52.0	0.02 U	NA	270
FDA-3 2.5ft	1/24/2018	NA	25 U	420	420	NA	NA	NA	NA	3.5	0.5 U	22	29	190.0	0.16	NA	220
MW-5 2-6in	7/31/2018	NA	25 U	96	96	NA	NA	NA	NA	4.9	0.7	39	140	120.0	0.1	NA	190
MW-5 10ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	2.4	0.22 U	18	14	2.1	0.02 U	NA	26
Former Underground Storage Tank (UST)																	
UST-1 5ft	1/24/2018	3 U	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
UST-2 3ft	1/24/2018	3 U	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Former Above Ground Storage Tank (AST)																	
AST-1 2ft	7/30/2018	NA	8,000	10,000	18,000	0.03 U	0.05 U	0.05 U	0.02 U	3.3	0.2 U	17	40	27.0	0.037	NA	100
AST-2 7.5-10'	7/26/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	2.21	1 U	9.49	18.1	2.7	0.1 U	NA	17.9
AST-2 10-12'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	2.30	1 U	10.8	18.8	3.8	0.1 U	NA	20.0
AST-3 5-7'	7/28/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	4.56	2.01	17.1	110	73.9	0.20	NA	47.0
AST-3 8-10'	7/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	4.84	1 U	9.30	8.66	1.7	0.1 U	NA	22.2
AST-4 1-2'	7/29/2022	37	5,300	2,200	7,500	NA	NA	NA	NA	3.05	1 U	9.27	53.3	95.4	0.16	NA	91.4
AST-4 4-5'	7/29/2022	5 U	50 U	250 U	ND	NA	NA	NA	NA	1.62	1 U	7.15	17.8	3.0	0.1 U	NA	20.2
AST-5-0-1'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-5-1-2'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-5-3-4'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-6-0-1'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-6-1-2'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-3. Summary of Uplands Soil Data – Total Petroleum Hydrocarbons and Metals
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	TPH (mg/kg)				BTEX (mg/kg)				Metals (mg/kg)							
		NWTPH-Gx	NWTPH-Dx Diesel Range	NWTPH-Dx Oil Range	Total Dx (Diesel + Oil)	Benzene	Toluene	Ethylbenzene	Xylenes	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
AST-6-3-4'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-7-0-1'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-7-1-2'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AST-7-3-4'	4/12/2023	NA	50 U	250 U	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Shop Floor Drain And Outfall																	
SFD-1 3.5ft	1/24/2018	3 U	190	50 U	190	0.03 U	0.05 U	0.05 U	0.02 U	2.2	0.5 U	19	56	2.9	0.02 U	NA	100
SFD-2 3.5ft	1/24/2018	3 U	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	1.9	0.5 U	12	29	1.9	0.021	NA	29
SFD-3***	1/24/2018	3 U	5,300	7,800	13,100	0.03 U	0.05 U	0.05 U	0.02 U	22	57	350	8,800	10,000	0.25	NA	7,100
MW-1 12ft	7/30/2018	32	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	3.4	0.2 U	18	32	4.4	0.02 U	NA	30
MW-1 15ft	7/30/2018	3 U	25 U	50 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	2.1	0.2 U	12	23	1.8	0.02 U	NA	24
SFD-4 0-1.5'	7/25/2022	5 U	50 U	250 U	ND	0.03 U	0.05 U	0.05 U	0.02 U	2.41	1.37	10.0	172	71.8	0.21	NA	150
SFD-4 1.5-3'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.95	1 U	11.9	19.7	2.4	0.1 U	NA	19.9
Storm Water Pond																	
SWP-1 1-3'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	3.41	1 U	14.6	51.2	10.6	0.085	NA	41.3
SWP-1 3-5'	7/25/2022	NA	NA	NA	NA	NA	NA	NA	NA	1.46	1 U	9.83	17.6	2.0	0.1 U	NA	17.8
Former Orcas Power and Light Company (OPALCO) Pad																	
OPALCO Pad 1-4in	1/24/2018	3 U	25 U	130	130	0.03 U	0.05 U	0.05 U	0.02 U	7.1	2.2	40	1,100	530	0.15	NA	2,300
OPALCO-2 2-6in	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	4.8	0.92	17	68	54.0	0.026	NA	2,600
OPALCO-2 5ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.2	0.19 U	16	45	2.1	0.02 U	NA	250
OPALCO-3 2-6in	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	7.1	1.1	30	1,300	990	0.34	NA	720
OPALCO-3 4ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	4.1	0.19 U	16	44	4.5	0.025	NA	39
OPALCO-4 2-6in	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	5.5	0.19 U	18	120	50.0	0.67	NA	74
OPALCO-4 5ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3.3	0.19 U	15	34	2.2	0.02 U	NA	31
MW-4 2-6in	7/31/2018	NA	25 U	120	120	NA	NA	NA	NA	7.9	0.79	43	590	390	0.22	NA	620
MW-4 11ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	8.4	0.23 U	64	31	3.4	0.02 U	NA	45
Misc. Upgradient Area																	
MW-6 2-6in	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	4	0.19 U	19	28	13.0	0.027	NA	65
MW-6 40ft	7/31/2018	NA	25 U	50 U	ND	NA	NA	NA	NA	3	0.2 U	14	16	1.5	0.02 U	NA	23
Eastern Uplands Undeveloped Area - Test Pits																	
IOSA-TP1-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.4	1 U	NA	11	5.0	1 U	15.4	28
IOSA-TP2-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.51	1 U	NA	10	5.8	1 U	7.4	16
IOSA-TP3-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	61	56.4	1 U	11.9	208
IOSA-TP3-3-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	1.85	1 U	NA	14	4.3	1 U	10.9	23
IOSA-TP4-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.33	1 U	NA	19	12.2	1 U	10.5	71
IOSA-TP5-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	57	248	1 U	13.9	287
IOSA-TP5-3-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	30	46.4	1 U	15.9	95
IOSA-TP5-5-1020	10/19/2020	5 U	50 U	250 U	ND	0.02 U	0.02 U	0.02 U	0.06 U	3.92	1 U	NA	37	80.7	1 U	13.6	115
IOSA-TP6-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.4	1 U	NA	34	241	1 U	9.43	182
IOSA-TP6-3-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	1 U	NA	15	3.2	1 U	16.6	19.6
IOSA-TP7-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.03	1 U	NA	20	20.8	1 U	9.81	35
IOSA-TP8-1-1020	10/19/2020	NA	NA	NA	NA	NA	NA	NA	NA	2.21	1 U	NA	13	8.1	1 U	9.04	40

Table 3-3. Summary of Uplands Soil Data – Total Petroleum Hydrocarbons and Metals
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	TPH (mg/kg)				BTEX (mg/kg)				Metals (mg/kg)							
		NWTPH-Gx	NWTPH-Dx Diesel Range	NWTPH-Dx Oil Range	Total Dx (Diesel + Oil)	Benzene	Toluene	Ethylbenzene	Xylenes	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
PCULs																	
Background	--	--	--	--	--	--	--	--	--	7.3	0.77	48	36	24	0.07	48	85
PQL	--	--	--	--	--	0.03	0.05	0.05	0.2	0.2	0.2	1	1	0.20	0.2	0.2	1
Human Health (0 to 15 feet)	--	100	2,000	2000	2,000	18	6,400	8,000	16,000	0.67*	80	1.20E+05	3,200	250	--	1,600	24,000
Marine Surface Water (vadose zone)	--	--	--	--	--	0.0088	0.72	0.18	0.94	2.9*	1.1	4.90E+06	1.4*	1600	0.026**	10*	100
TEE (0 to 6 feet)	--	12,000	15,000	--	--	--	--	--	--	20	36	135	550	220	9	1,850	570
MTCA SMS Benthic SCO	--	--	--	--	--	--	--	--	--	57	5.1	260	390	450	0.41	--	410
Summary Statistics																	
# Samples	--	28	81	81	81	13	13	13	13	95	99	87	99	99	98	16	99
# Detections	--	3	17	27	28	0	0	0	0	94	26	87	99	99	51	16	99
# Non-Detects	--	25	64	54	53	13	13	13	13	1	73	0	0	0	47	0	0
Detection Frequency	--	11%	21%	33%	35%	0%	0%	0%	0%	99%	26%	100%	100%	100%	52%	100%	100%
Maximum Detected Value	--	37	8,000	10,000	18,000	0	0	0	0	150	57	350	9,300	10,000	13	17	7,100
# Exceedances of Most Stringent PCUL	--	0	3	3	4	0	0	0	0	13	10	1	58	19	23	0	37
Exceedance Frequency	--	0.0%	3.7%	3.7%	4.9%	0.0%	0.0%	0.0%	0.0%	13.7%	10.1%	1.1%	58.6%	19.2%	23.5%	0.0%	37.4%

Notes and Abbreviations:

mg/kg - milligrams per kilogram

* The screening level defaults to the background value.

** The screening level defaults to the PQL value.

***Shop Floor Drain-3 (SFD-3) was comprised of solids collected directly from the inside of a floor drain within the shop building, at an approximate depth of 1.5 ft below the floor surface.

ND - indicates calculated sum of analytes that were not detected at level above respective reporting limits

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

Pink shaded cell indicates saturated zone

Tan shaded cell indicates vadose zone

Value above Background SL

Value above PQL

Value above Human Health (0 to 15 feet) SL

Value above Marine Surface Water (vadose zone) SL

Value above TEE (0 to 6 feet) SL

ND concentration with reporting limit greater than PCUL

NA - indicates sample was not analyzed for the constituent

PQL - practical quantitation limit

U - indicates analyte was not detected at level above the indicated reporting limit

Table 3-4. Summary of Uplands Soil Data – Tributyltin, Dioxins/Furans, and PCBs

Jensen's Shipyard and Marina

Port of Friday Harbor

Sample ID	Date	Dioxins/ Furans TEQ (ng/kg)	Tributyltin (TBT) (ug/kg)	Total PCB Aroclors (mg/kg)
Surface Rail Work Area (SRWA)				
MW-3 2-6in	8/1/2018	131.67	NA	NA
SRWA-8 0-1'	7/26/2022	25.39	7.22	0.081
SRWA-9 2.5-5'	7/26/2022	0.0062	3.86 U	0.02 U
SRWA-10 3-5'	7/28/2022	1.62	9.86	NA
SRWA-11 0-2.5'	7/26/2022	NA	55.5	NA
SRWA-14 0-1'	7/26/2022	13.39	2.18 J	0.19
SRWA-14 1-2'	7/26/2022	NA	NA	0.02 U
Boat Lift Work Area (BLWA)				
BLWA-11 0-2.5'	7/25/2022	NA	NA	0.46
MW-7 3-5'	7/27/2022	NA	NA	0.02 U
MW-8 4-5'	7/28/2022	NA	NA	0.14
MW-9 0-2.5'	7/27/2022	20.73	38.5	0.022
OPALCO PAD Area				
OPALCO Pad 1-4in	1/24/2018	NA	NA	0.10 U
OPALCO-2 2-6in	7/31/2018	NA	NA	0.10 U
OPALCO-2 5'	7/31/2018	NA	NA	0.10 U
OPALCO-3 2-6in	7/31/2018	NA	NA	0.10 U
OPALCO-3 4'	7/31/2018	NA	NA	0.10 U
OPALCO-4 2-6in	7/31/2018	NA	NA	0.10 U
OPALCO-4 5'	7/31/2018	NA	NA	0.10 U
MW-4 2-6in	7/31/2018	21.70	NA	0.10
MW-4 11'	7/31/2018	NA	NA	0.10 U
Background	--	5.2	--	--
PQL	--	5.0	3.86	0.02
Human Health (0 to 15 feet)	--	0.000013*	--	0.5
Marine Surface Water (vadose zone)	--	0.000000025*	1.7*	1.10E-05
TEE (0 to 6 feet)	--	--	--	2
MTCA SMS Benthic SCO	--	--	--	0.13
Summary Statistics				
# Samples	--	7	6	17
# Detections	--	7	5	6
# Non-Detects	--	0	1	11
Detection Frequency	--	100%	83%	35%
Maximum Detected Value	--	131.7	55.5	0.5
# Exceedances of Most Stringent PCUL	--	5	3	6
Exceedance Frequency	--	71%	50%	35%

Notes and Abbreviations:

mg/kg - milligrams per kilogram

* The screening level defaults to the PQL value.

ug/kg - micrograms per kilogram

ng/kg - nanograms per kilogram

NA - indicates sample was not analyzed for the constituent

PQL - practical quantitation limit

ND - indicates calculated sum of analytes that were not detected at level above respective reporting limits

J - reported concentration is an estimate.

U - indicates analyte was not detected at level above the indicated reporting limit

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

Indicates soil sample interval in the saturated zone

Indicates soil sample interval in the vadose zone

Value above Background SL

Value above PQL

Value above Human Health (0 to 15 feet) SL

Value above Marine Surface Water (vadose zone) SL

Value above TEE (0 to 6 feet) SL

Table 3-5. Summary of Uplands Soil Data - cPAHs
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	cPAHs (mg/kg)									
		Benzo[a]anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total cPAH TEQ (ND=0)		
Surface Rail Work Area (SRWA)											
SRWA-1 3-6in	1/24/2018	0.40	0.81	0.28	0.52	0.530	0.110	0.400	0.725		
SRWA-6 2-6in	8/1/2018	1.20	1.3	0.02 U	1.10	1.300	0.200	0.620	1.445		
SRWA-6 3ft	8/1/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
SRWA-7 2-6in	8/1/2018	0.02 U	0.02 U	0.02 U	0.065	0.020 U	0.02 U	0.079	0.073		
SRWA-7 3ft	8/1/2018	0.17	0.23	0.02 U	0.16	0.180	0.02 U	0.110	0.213		
MW-3 2-6in	8/1/2018	0.076	0.15	0.02 U	0.081	0.11	0.02 U	0.071	0.112		
MW-3 5.5ft	8/1/2018	0.02 U	0.042	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.004		
SRWA-8 0-1'	7/26/2022	0.05 U	0.051	0.05 U	0.05	0.05 U	0.05 U	0.05 U	0.005		
SRWA-9 2.5-5'	7/26/2022	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		
SRWA-10 3-5'	7/28/2022	0.024	0.053	0.017	0.036	0.034	0.01 U	0.026	0.041		
SRWA-11 0-2.5'	7/26/2022	0.10 U	0.12	0.10 U	0.087 J	0.100 U	0.100 U	0.100 U	0.099		
SRWA-14 0-1'	7/26/2022	0.05	0.06	0.02	0.055	0.054	0.010 U	0.032	0.072		
SRWA-14 1-2'	7/26/2022	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		
Boat Lift Work Area (BLWA)											
BLWA-1 0-3in	7/30/2018	NA	NA	NA	NA	NA	NA	NA	NA		
BLWA-2 0-3in	7/30/2018	NA	NA	NA	NA	NA	NA	NA	NA		
BLWA-3 2-6in	7/30/2018	0.82	0.83	0.02 U	0.33	1.000	0.064	0.170	0.528		
BLWA-3 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-4 2-6in	7/30/2018	0.067	0.16	0.02 U	0.065	0.020 U	0.024	0.068	0.097		
BLWA-4 5ft	7/30/2018	0.036	0.14	0.02 U	0.037	0.098	0.020 U	0.036	0.061		
BLWA-5 2-6in	7/30/2018	0.45	0.6	0.02 U	0.380	0.590	0.091	0.280	0.528		
BLWA-5 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-6 2-6in	7/30/2018	0.50	1.4	0.02 U	0.460	0.02 U	0.130	0.420	0.705		
BLWA-6 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-6 5ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-6 10 ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-7 2-6in	7/30/2018	0.02 U	0.59	0.02 U	0.16	0.020 U	0.066	0.220	0.248		
BLWA-7 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-7 5ft	7/30/2018	NA	NA	NA	NA	NA	NA	NA	NA		
BLWA-8 2-6in	7/30/2018	0.08	0.18	0.02 U	0.083	0.130	0.028	0.078	0.121		
BLWA-8 2ft	7/30/2018	0.04	0.06	0.02 U	0.029	0.032	0.020 U	0.028	0.041		
BLWA-8 5ft	7/30/2018	NA	NA	NA	NA	NA	NA	NA	NA		
BLWA-9 2-6in	7/30/2018	0.32	1.2	0.02 U	0.61	0.02 U	0.20	0.80	0.862		
BLWA-9 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U		
BLWA-9 5ft	7/30/2018	NA	NA	NA	NA	NA	NA	NA	NA		
MW-2 6in	7/30/2018	0.02 U	0.380	0.02 U	0.064	0.02 U	0.035	0.110	0.117		
MW-2 7ft	7/30/2018	0.05	0.060	0.02 U	0.048	0.045	0.02 U	0.035	0.063		
BLWA-10 0-1'	7/28/2022	0.05	0.14	0.04	0.05	0.120	0.011	0.047	0.080		
BLWA-11 0-2.5'	7/25/2022	0.33	0.83	0.27	0.39	0.680	0.062	0.290	0.575		
BLWA-12 0-2'	7/25/2022	0.05	0.19	0.05	0.083	0.120	0.050 U	0.083	0.122		
BLWA-13 0-2'	7/27/2022	0.09	0.23	0.08	0.10	0.170	0.050 U	0.009	0.142		
MW-7 3-5'	7/27/2022	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U		
MW-8 4-5'	7/28/2022	0.05 U	0.05 U	0.05 U	0.05	0.05 U	0.05 U	0.05 U	0.05 U		
MW-9 0-2.5'	7/27/2022	0.01	0.07	0.02	0.034	0.03	0.01 U	0.02	0.046		

Table 3-5. Summary of Uplands Soil Data - cPAHs
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	cPAHs (mg/kg)								
		Benzo[a]anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total cPAH TEQ (ND=0)	
Former Dumping Area (FDA)										
MW-5 2-6in	7/31/2018	0.05	0.09	0.02 U	0.05	0.05	0.02 U	0.04	0.068	
MW-5 10ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
Former Above Ground Storage Tank (AST)										
AST-1 2ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
Shop Floor Drain And Outfall										
SFD-3***	1/24/2018	0.41	0.00002 U	0.00002 U	0.00002 U	0.63	0.00002 U	0.18	0.07	
MW-1 12ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
MW-1 15ft	7/30/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
Former Orcas Power and Light Company (OPALCO) Pad										
OPALCO-2 2-6in	7/31/2018	0.02 U	0.04	0.02 U	0.022	0.02 U	0.02 U	0.02 U	0.026	
OPALCO-2 5ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
OPALCO-3 2-6in	7/31/2018	0.10	0.17	0.02 U	0.06	0.16	0.02 U	0.05	0.094	
OPALCO-3 4ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
OPALCO-4 2-6in	7/31/2018	0.02 U	0.06	0.02 U	0.024	0.02 U	0.02 U	0.04	0.033	
OPALCO-4 5ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
MW-4 2-6in	7/31/2018	0.095	0.170	0.02 U	0.076	0.092	0.02 U	0.058	0.109	
MW-4 11ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
Misc. Upgradient Area										
MW-6 2-6in	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	
MW-6 40ft	7/31/2018	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	

Table 3-5. Summary of Uplands Soil Data - cPAHs
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	cPAHs (mg/kg)							
		Benzo[a]anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total cPAH TEQ (ND=0)
PCULs									
PQL	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Human Health (0 to 15 feet)	--	--	--	--	0.19	--	--	--	0.19
Marine Surface Water (vadose zone)	--	--	--	--	0.00031*	--	--	--	0.00031*
TEE (0 to 6 feet)	--	--	--	--	300	--	--	--	300
MTCA SMS Benthic SCO		1.3 **	--	--	1.6 **	1.4 **	0.23 **	0.6 **	1.6 **
Summary Statistics									
# Samples	--	54	54	54	54	54	54	54	54
# Detections	--	24	30	8	29	21	12	28	32
# Non-Detects	--	30	24	46	25	33	42	26	22
Detection Frequency	--	44%	56%	15%	54%	39%	22%	52%	59%
Maximum Detected Value	--	1.20	1.40	0.28	1.10	1.30	0.20	0.80	1.45
# Exceedances of Most Stringent PCUL	--	0	--	--	33	0	0	2	35
Exceedance Frequency	--	0%	--	--	61%	0%	0%	4%	65%

Notes:

All units in mg/kg - milligrams per kilogram

* The screening level defaults to the PQL value.

**Dry-weight basis Marine Apparent Effects Threshold (AET) for benzo(a)pyrene.

***Shop Floor Drain-3 (SFD-3) was comprised of solids collected directly from the inside of a floor drain within the shop building, at an approximate depth of 1.5 ft below the floor surface.

- NA - indicates sample was not analyzed for the constituent
- PQL - practical quantitation limit
- U - indicates analyte was not detected at level above the indicated reporting limit
- BOLD** - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)
- Indicates soil sample interval in the saturated zone

Indicates soil sample interval in the vadose zone

Value above Background SL

Value above PQL

Value above Human Health (0 to 15 feet) SL

Value above Marine Surface Water (vadose zone) SL

Value above TEE (0 to 6 feet) SL

ND concentration with reporting limit greater than PCUL

Table 3-6. Summary of Uplands Data - SVOCs
Jensen's Shipyard and Marina
Port of Friday Harbor

Semi-Volatile Organic Compounds (SVOCs) (mg/kg)	Most Stringent PCUL ¹	Shop Floor Drain-3 (SFD-3) ²		SRWA-1 3-6in	
		1/24/2018		1/24/2018	
Pyridine	80	0.23	U	0.2	U
N-Nitrosodimethylamine	0.01	0.12	U	0.1	U
Phenol	0.1	0.14	U	0.1	U
Aniline	180	0.27	U	0.17	U
Bis(2-Chloroethyl) Ether	0.025	0.13	U	0.1	U
2-Chlorophenol	0.1	0.11	U	0.1	U
1,3-Dichlorobenzene	0.023	0.13	U	0.1	U
1,4-Dichlorobenzene	0.11	0.14	U	0.1	U
Benzyl alcohol	0.57	0.49		0.11	U
1,2-Dichlorobenzene	0.035	0.1	U	0.1	U
2-Methylphenol	0.1	6.6		0.1	U
Bis(2-Chloroisopropyl)Ether	2.1	0.19	U	0.12	U
3&4-Methylphenol	0.67	2.9		0.13	U
N-Nitroso-Di-N-Propylamine	0.01	0.24	U	0.15	U
Hexachlorethane	0.01	0.14	U	0.1	U
Nitrobenzene	0.64	0.1	U	0.1	U
Isophorone	0.58	0.13	U	0.1	U
2-Nitrophenol	NC	0.25	U	0.25	U
2-4-Dimethylphenol	0.1	2.6		0.1	U
Benzoic Acid	0.65	1	U	1	U
Bis(2-Chloroethoxy)Methane	240	0.1	U	0.1	U
2,4-Dichlorophenol	0.1	0.11	U	0.1	U
1,2,4-Trichlorobenzene	0.01	0.15	U	0.1	U
Naphthalene	2.1	0.052		0.12	
4-Chloroaniline	5	0.32	U	0.2	U
2,6-Dichlorophenol	NC	0.16	U	0.1	U
Hexachlorobutadiene	0.01	0.22	U	0.1	U
4-Chloro-3-Methylphenol	0.5	0.14	U	0.1	U
2-Methylnaphthalene	0.67	0.085		0.0067	
1-Methylnaphthalene	20	0.076		0.0052	
Hexachlorocyclopentadiene	0.032	0.5	U	0.5	U
2,4,6-Trichlorophenol	0.1	0.13	U	0.1	U
2,4,5-Trichlorophenol	0.1	0.2	U	0.12	U
2-Chloronaphthalene	5.4	0.1	U	0.1	U
2-Nitroaniline	800	0.25	U	0.25	U
Acenaphthylene	NC	0.00002	U	0.095	
Dimethylphthalate	0.1	0.17	U	0.29	
2,6-Dinitrotoluene	0.67	0.25	U	0.25	U
Acenaphthene	0.5	0.00002	U	0.012	
3-Nitroaniline	NC	0.25	U	0.25	U
2,4-Dinitrophenol	0.4	0.3	U	0.25	U
4-Nitrophenol	NC	0.5	U	0.5	U
Dibenzofuran	80	0.16	U	0.1	U
2,4-Dinitrotoluene	0.05	0.25	U	0.25	U
2,3,4,6-Tetrachlorophenol	2400	0.25	U	0.25	U
Diethylphthalate	0.2	0.17	U	0.1	U
Fluorene	0.54	0.00002	U	0.12	U

Table 3-6. Summary of Uplands Data - SVOCs
Jensen's Shipyard and Marina
Port of Friday Harbor

Semi-Volatile Organic Compounds (SVOCs) (mg/kg)	Most Stringent PCUL ¹	Shop Floor Drain-3 (SFD-3) ²		SRWA-1 3-6in	
		1/24/2018		1/24/2018	
4-Chlorophenyl-Phenylether	NC	0.21	U	0.13	U
4-Nitroaniline	50	0.39	U	0.25	U
4,6-Dinitro-2-Methylphenol	0.5	0.34	U	0.15	U
N-Nitrosodiphenylamine	0.028	0.18	U	0.11	U
Azobenzene	9.1	0.18	U	0.1	U
4-Bromophenyl-Phenylether	NC	0.15	U	0.1	U
Hexachlorobenzene	0.01	0.12	U	0.5	U
Pentachlorophenol	0.05	0.5	U	0.1	U
Phenanthrene	NC	0.27		0.25	
Anthracene	0.96	0.21		0.11	
Carbazole	NC	0.33	U	0.2	U
Di-N-Butylphthalate	0.28	0.14	U	0.13	U
Fluoranthene	5.9	0.00002	U	0.67	
Pyrene	2.6	0.79		0.65	
Butylbenzylphthalate	0.03	0.19	U	0.12	U
3,3-Dichlorobenzidine	0.1	0.81	U	0.51	U
Benzo[A]Anthracene	see cPAH	0.41		0.4	
Chrysene	see cPAH	0.63		0.53	
Bis(2-ethylhexyl)phthalate	0.16	5.3		0.13	U
Di-N-Octylphthalate	6.2	0.19	U	0.12	U
Benzo[B]Fluoranthene	see cPAH	0.00002	U	0.81	
Benzo[K]Fluoranthene	see cPAH	0.00002	U	0.28	
Benzo[A]Pyrene	0.02	0.00002	U	0.52	
Indeno[1,2,3-Cd]Pyrene	see cPAH	0.18		0.4	
Dibenz[A,H]Anthracene	see cPAH	0.00002	U	0.11	
Benzo[G,H,I]perylene	0.67	0.39		0.57	
Total cPAH Equivalent (TEQ)	0.02	0.07		0.73	

Notes:

All units in mg/kg - milligrams per kilogram

1. See Table 5-1 for basis of PCULs.

2. Shop Floor Drain-3 (SFD-3) is a sample of material collected from directly inside the floor drain in the shop building.

3. Sample consists of sediment collected below the high-tide line.

Value above most stringent PCUL

Table 3-7. Summary of Uplands Soil Data - Pesticides
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	DDD (mg/kg)		DDE (mg/kg)		DDT (mg/kg)		Total DDx (mg/kg)
Surface Rail Work Area (SRWA)								
SRWA-8 0-1'	7/26/2022	0.01	U	0.01	U	0.01	U, ca	ND
SRWA-9 2.5-5'	7/26/2022	0.01	U	0.01	U	0.01	U	ND
SRWA-10 3-5'	7/28/2022	0.01	U	0.01	U	0.01	U	ND
SRWA-14 0-1'	7/26/2022	0.01	U	0.01	U	0.023	ca	0.023
SRWA-14 1-2'	7/26/2022	0.01	U	0.01	U	0.01	U	ND
Boat Lift Work Area (BLWA)								
MW-9 0-2.5'	7/27/2022	0.01	U	0.01	U	0.01	U	ND
PCULs								
Background	--	--		--		--		--
PQL	--	0.01		0.01		0.01		0.01
Human Health (0 to 15 feet)	--	4.2		2.9		2.9		--
Marine Surface Water (vadose zone)	--	0.0000073*		0.0000015*		0.000016*		--
TEE (0 to 6 feet)	--	--		--		--		1.0
MTCA SMS Benthic SCO	--	--		--		--		--
Summary Statistics								
# Samples	--	6		6		6		7
# Detections	--	0		0		0		1
# Non-Detects	--	6		6		6		6
Detection Frequency	--	0%		0%		0%		14%
Maximum Detected Value	--	0.01		0.01		0.023		0.023
# Exceedances of Most Stringent PCUL	--	1		0		1		1
Exceedance Frequency	--	17%		0%		17%		14%

Notes:

mg/kg - milligrams per kilogram

* The screening level defaults to the PQL value.

ca - The calibration results for the analyte were outside of acceptance criteria with a detection for the analyte in the sample. The value reported is an estimate

NA - indicates sample was not analyzed for the constituent

PQL - practical quantitation limit

ND - indicates calculated sum of analytes that were not detected at level above respective reporting limits

U - indicates analyte was not detected at level above the indicated reporting limit

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

Pink shaded cell indicates saturated zone

Tan shaded cell indicates vadose zone

Value above Background SL

Value above PQL

Value above Human Health (0 to 15 feet) SL

Value above Marine Surface Water (vadose zone) SL

Value above TEE (0 to 6 feet) SL

Table 3-8. Summary of Uplands Data - VOCs
Jensen's Shipyard and Marina
Port of Friday Harbor

Volatile Organic Compounds (VOCs) (mg/kg)	Most Stringent PCUL ¹	Shop Floor Drain-3 (SFD-3) ²		SRWA-3 0-6in	
		1/24/2018		1/24/2018	
Benzene	0.03	0.03	U	0.03	U
Toluene	0.72	0.05	U	0.05	U
Ethylbenzene	0.18	0.05	U	0.05	U
Xylenes	0.94	0.2	U	0.2	U
Dichlorodifluoromethane	16,000	0.01	U	0.01	U
Chloromethane	0.5	0.01	U	0.01	U
Vinyl Chloride	0.002	0.01	U	0.01	U
Bromomethane	4.4	0.01	U	0.01	U
Chloroethane	0.1	0.01	U	0.01	U
Carbon Tetrachloride	0.05	0.01	U	0.01	U
Trichlorofluoromethane	24,000	0.01	U	0.01	U
Carbon Disulfide	8,000	0.01	U	0.01	U
Acetone	72,000	0.05	U	0.05	U
1,1-Dichloroethane	180	0.01	U	0.01	U
Methylene Chloride	0.43	0.02	U	0.02	U
Acrylonitrile	0.02	0.05	U	0.01	U
Methyl tert-butyl ether (MTBE)	560	0.01	U	0.01	U
Trans-1,2-Dichloroethylene	5.2	0.01	U	0.01	U
1,1-Dichloroethane	180	0.01	U	0.01	U
Methyl ethyl ketone (2-butanone)	48,000	0.05	U	0.05	U
cis-1,2-Dichloroethylene	160	0.01	U	0.01	U
Chloroform	2.9	0.01	U	0.01	U
1,1,1-Trichloroethane	370	0.01	U	0.01	U
1,2-Dichloroethane (EDC)	0.35	0.01	U	0.01	U
Trichloroethylene (TCE)	0.0044	0.01	U	0.01	U
1,2-Dichloropropane	0.05	0.01	U	0.01	U
Dibromomethane	800	0.01	U	0.01	U
Dichlorobromomethane	0.013	0.01	U	0.01	U
Trans-1,3-Dichloropropene	0.05	0.01	U	0.01	U
Methyl isobutyl ketone	6400	0.05	U	0.01	U
Cis-1,3-Dichloropropene	0.05	0.01	U	0.01	U
1,1,2-Trichloroethane	0.05	0.01	U	0.01	U
2-Hexanone	400	0.05	U	0.05	U
1,3-Dichloropropane	1,600	0.01	U	0.01	U
Tetrachloroethylene	0.029	0.017		0.01	U
Dibromochloromethane	0.05	0.01	U	0.01	U
Ethylene dibromide (EDB)	0.5	0.005	U	0.01	U
Chlorobenzene	1.7	0.01	U	0.01	U
1,1,1,2-Tetrachloroethane	38	0.01	U	0.01	U
Styrene	16,000	0.01	U	0.01	U
Bromoform	0.078	0.01	U	0.01	U
Isopropylbenzene (cumene)	8,000	0.01	U	0.01	U
1,1,2,2-Tetrachloroethane	0.05	0.01	U	0.01	U
1,2,3-Trichloropropane	0.05	0.01	U	0.01	U
Bromobenzene	640	0.01	U	0.01	U
n-Propylbenzene	8,000	0.01	U	0.017	
2-Chlorotoluene	1,600	0.01	U	0.01	U
1,3,5-Trimethylbenzene	800	0.01	U	0.24	
4-Chlorotoluene	1,600	0.01	U	0.01	U
1,2,4-Trimethylbenzene	800	0.01	U	0.61	
sec-Butylbenzene	8,000	0.01	U	0.033	
P-Isopropyltoluene	--	0.01	U	0.033	
n-Butylbenzene	4,000	0.01	U	0.055	
1,2-Dibromo-3-chloropropane	0.5	0.05	U	0.05	U
1,2,3-Trichlorobenzene	64	0.01	U	0.01	U

Notes:
All units in mg/kg - milligrams per kilogram
1. Detected VOC concentrations do not exceed most stringent PCULs. See Table 5-1 for basis of PCULs.
2. Shop Floor Drain-3 (SFD-3) is a sample of material collected from directly inside the floor drain in the shop building.

Table 3-9a. Ship Rail Work Area Sediment Data – TPH, Metals
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	TPH (mg/kg)				Metals (mg/kg)							
		NWTPH-Gx	NWTPH-Dx Diesel Range	NWTPH-Dx Oil Range	Total Dx (Diesel + Oil)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
SRWA-2 3-6in	1/24/2018	NA	91	220	311	14	0.5 U	18	1,100	1000	6.3	NA	330
SRWA-3 0-6in	1/24/2018	NA	3,900	940	4,840	17	0.5 U	21	690	90	0.54	NA	580
SRWA-4 6in	8/1/2018	NA	79	190	269	54	0.39	35	2,000	1800	11	NA	450
SRWA-4 3.5ft	8/1/2018	NA	25 U	50 U	ND	7.7	0.22 U	24	35	15	0.098	NA	64
SRWA-5 2-6in	8/1/2018	NA	25 U	72	72	12	0.32	20	420	940	0.33	NA	460
SRWA-5 3.5 ft	8/1/2018	NA	25 U	50 U	ND	4.2	1.5	11	43	21.0	0.04	NA	58
SRWA-5 5ft	8/1/2018	NA	25 U	50 U	ND	5.1	0.23 U	20	16	3.6	0.02 U	NA	55
SRWA-13 0-0.5'	7/26/2022	5 U	50 U	250 U	ND	11.9	1 U	11.7	2,140	170	1.5	NA	519
SRWA-13 0.5-1'	7/26/2022	NA	NA	NA	NA	10.6	1 U	12.7	919	389	3.5	NA	317
SRWA-13 3-5'	7/26/2022	NA	NA	NA	NA	6.56	1 U	8.71	20.8	11.6	0.10 U	NA	31.7
SRWA-15 0-0.5'	7/26/2022	5 U	50 U	250 U	ND	1.8	1 U	7.68	12.5	35.1	0.10 U	NA	26.7
MTCA SMS Marine Sediment AET SCO:	--	--	--	--	--	57	5.1	260	390	450	0.41	--	410

Notes and Abbreviations:

mg/kg - milligrams per kilogram

PQL - practical quantitation limit

NA - indicates sample was not analyzed for the constituent

ND - indicates calculated sum of analytes that were not detected at level above respective reporting limits

U - indicates analyte was not detected at level above the indicated reporting limit

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

Exceeds the MTCA SMS Benthic SCO

Table 3-9b. Summary of Ship Rail Work Area Sediment Data - cPAHs, dioxins/furans, TBT, PCBs, DDx
Jensen's Shipyard and Marina
Port of Friday Harbor

Sample ID	Date	cPAHs (mg/kg)		Dioxins/ Furans TEQ (pg/g)	Tributyltin (µg/kg)	Total PCB Aroclors (mg/kg)	DDD (mg/kg)	DDE (mg/kg)	DDT (mg/kg)	Total DDx (mg/kg)
		Benzo(a) pyrene	Total cPAH TEQ (ND=0)							
SRWA-2 3-6in	1/24/2018	0.14	0.18	NA	NA	NA	NA	NA	NA	NA
SRWA-3 0-6in	1/24/2018	0.22	0.30	NA	NA	NA	NA	NA	NA	NA
SRWA-4 6in	8/1/2018	0.50	0.66	NA	NA	NA	NA	NA	NA	NA
SRWA-4 3.5ft	8/1/2018	0.02 U	0.02 U	NA	NA	NA	NA	NA	NA	NA
SRWA-5 2-6in	8/1/2018	0.17	0.23	NA	NA	NA	NA	NA	NA	NA
SRWA-5 3.5 ft	8/1/2018	0.06	0.07	NA	NA	NA	NA	NA	NA	NA
SRWA-5 5ft	8/1/2018	0.02 U	0.02 U	NA	NA	NA	NA	NA	NA	NA
SRWA-13 0-0.5'	7/26/2022	0.43	0.61	102.54	508	1.41	0.038 ca	0.01 U	0.063 ca	NA
SRWA-13 0.5-1'	7/26/2022	NA	NA	NA	NA	0.30	NA	NA	NA	NA
SRWA-13 3-5'	7/26/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA
SRWA-15 0-0.5'	7/26/2022	0.01 U	0.01 U	0.36	0.62 J	0.02 U	0.01 U	0.01 U	0.01 U, ca	0.02 U
MTCA SMS Benthic SCO:	--	1.6	--	--	--	0.13	--	--	--	--

Notes and Abbreviations:

ca - The calibration results for analyte were outside of acceptance criteria. The value reported is an estimate.

mg/kg - milligrams per kilogram

PQL - practical quantitation limit

NA - indicates sample was not analyzed for the constituent

ND - indicates calculated sum of analytes that were not detected at level above respective reporting limits

U - indicates analyte was not detected at level above the indicated reporting limit

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

Exceeds the MTCA SMS Benthic SCO

Table 3-9c. Ship Rail Work Area Sediment Data – SVOCs
Jensen's Shipyard and Marina
Port of Friday Harbor

Semi-Volatile Organic Compounds (SVOCs) (mg/kg)	MTCA SMS Marine Sediment AET SCO ¹	SRWA-2 3-6in		SRWA-3 0-6in	
		1/24/2018		1/24/2018	
Pyridine	NC	0.2	U	0.2	U
N-Nitrosodimethylamine	NC	0.1	U	0.1	U
Phenol	0.42	0.1	U	0.12	U
Aniline	NC	0.17	U	0.23	U
Bis(2-Chloroethyl) Ether	NC	0.1	U	0.11	U
2-Chlorophenol	NC	0.1	U	0.1	U
1,3-Dichlorobenzene	NC	0.1	U	0.11	U
1,4-Dichlorobenzene	0.11	0.1	U	0.12	U
Benzyl alcohol	0.073	0.11	U	0.14	U
1,2-Dichlorobenzene	NC	0.1	U	0.1	U
2-Methylphenol	0.063	0.1	U	0.13	U
Bis(2-Chloroisopropyl)Ether	NC	0.12	U	0.16	U
3&4-Methylphenol	0.67	0.13	U	0.17	U
N-Nitroso-Di-N-Propylamine	NC	0.15	U	0.2	U
Hexachlorethane	NC	0.1	U	0.11	U
Nitrobenzene	NC	0.1	U	0.1	U
Isophorone	NC	0.1	U	0.1	U
2-Nitrophenol	NC	0.25	U	0.25	U
2,4-Dimethylphenol	NC	0.1	U	0.1	U
Benzoic Acid	0.65	1	U	1	U
Bis(2-Chloroethoxy)Methane	NC	0.1	U	0.1	U
2,4-Dichlorophenol	NC	0.1	U	0.1	U
1,2,4-Trichlorobenzene	0.031	0.1	U	0.12	U
Naphthalene	NC	0.0071		0.1	U
4-Chloroaniline	NC	0.2	U	0.26	U
2,6-Dichlorophenol	NC	0.1	U	0.13	U
Hexachlorobutadiene	0.011	0.1	U	0.18	U
4-Chloro-3-Methylphenol	NC	0.1	U	0.11	U
2-Methylnaphthalene	NC	0.0041		1.2	
1-Methylnaphthalene	NC	0.0052		0.9	
Hexachlorocyclopentadiene	NC	0.5	U	0.5	U
2,4,6-Trichlorophenol	NC	0.1	U	0.11	U
2,4,5-Trichlorophenol	NC	0.12	U	0.17	U
2-Chloronaphthalene	NC	0.1	U	0.1	U
2-Nitroaniline	NC	0.25	U	0.25	U
Acenaphthylene	1.3	0.077		0.00002	U
Dimethylphthalate	0.071	0.64		0.14	U
2,6-Dinitrotoluene	NC	0.25	U	0.25	U
Acenaphthene	0.5	0.00002	U	0.00002	U
3-Nitroaniline	NC	0.25	U	0.25	U
2,4-Dinitrophenol	NC	0.25	U	0.25	U
4-Nitrophenol	NC	0.5	U	0.5	U
Dibenzofuran	0.54	0.1	U	0.14	U
2,4-Dinitrotoluene	NC	0.25	U	0.25	U
2,3,4,6-Tetrachlorophenol	NC	0.25	U	0.25	U
Diethylphthalate	0.2	0.1	U	0.14	U
Fluorene	0.54	0.12	U	0.12	U

Table 3-9c. Ship Rail Work Area Sediment Data – SVOCs
Jensen's Shipyard and Marina
Port of Friday Harbor

Semi-Volatile Organic Compounds (SVOCs) (mg/kg)	MTCA SMS Marine Sediment AET SCO ¹	SRWA-2 3-6in		SRWA-3 0-6in	
		1/24/2018		1/24/2018	
4-Chlorophenyl-Phenylether	NC	0.13	U	0.17	U
4-Nitroaniline	NC	0.25	U	0.32	U
4,6-Dinitro-2-Methylphenol	NC	0.15	U	0.29	U
N-Nitrosodiphenylamine	0.028	0.11	U	0.15	U
Azobenzene	NC	0.1	U	0.15	U
4-Bromophenyl-Phenylether	NC	0.1	U	0.13	U
Hexachlorobenzene	NC	0.5	U	0.1	U
Pentachlorophenol	0.36	0.1	U	0.1	U
Phenanthrene	NC	0.13		0.62	
Anthracene	NC	0.053		0.00002	U
Carbazole	NC	0.2	U	0.27	U
Di-N-Butylphthalate	1.4	0.13	U	0.13	U
Fluoranthene	NC	0.21		0.62	
Pyrene	NC	0.21		0.57	
Butylbenzylphthalate	0.063	0.12	U	0.16	U
3,3-Dichlorobenzidine	NC	0.51	U	0.68	U
Benzo[A]Anthracene	1.3	0.11		0.21	
Chrysene	1.4	0.12		0.34	
Bis(2-ethylhexyl)phthalate	1.3	0.13	U	0.21	
Di-N-Octylphthalate	6.2	0.12	U	0.16	U
Benzo[B]Fluoranthene	see total	0.2		0.43	
Benzo[K]Fluoranthene	see total	0.11	U	0.00002	U
Total benzofluoranthenes	3.2	0.31		0.43	
Benzo[A]Pyrene	1.6	0.14		0.22	
Indeno[1,2,3-Cd]Pyrene	0.6	0.12		0.15	
Dibenz[A,H]Anthracene	0.23	0.1	U	0.00002	U
Benzo[G,H,I]perylene	NC	0.19		0.17	

Notes and Abbreviations:

All units in mg/kg - milligrams per kilogram

1. See Table 5-1 for basis of PCULs.

2. Shop Floor Drain-3 (SFD-3) is a sample of material collected from directly inside the floor drain in the shop building.

3. Sample consists of sediment collected below the high-tide line.

Exceeds the MTCA SMS Marine Sediment AET SCO

ND concentration with reporting limit greater than PCUL

**Table 3-10. Former Stormwater Pond Sediment Samples
Jensen's Shipyard and Marina
Port of Friday Harbor**

		Stormwater Pond	Storm Sed-1
Analyte	PCUL/TCLP Criteria	1/24/2018	7/30/2018
Metals (EPA-6020/7471) (mg/kg)	Marine Surface Water (vadose zone) ¹		
Arsenic	2.9	10	NA
Cadmium	1.1	10	NA
Chromium	4900000	43	NA
Copper	1.4	12,000	NA
Lead	1600	450	NA
Mercury	0.03	0.15	NA
Zinc	100	2,400	NA
TCLP Metals (EPA-1311) (mg/L)	Toxicity Characteristic Criteria		
Arsenic	5	NA	<0.025 U
Barium	100	NA	1.1
Cadmium	1	NA	<0.025 U
Chromium	5	NA	<0.026 U
Lead	5	NA	0.36
Mercury	0	NA	<0.026 U
Selenium	1	NA	<0.026 U
Silver	5	NA	<0.026 U
Bioassay (Ecology 80-12)	--	NA	Not Dangerous

Notes:

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

NA - indicates sample was not analyzed for the constituent

U - indicates analyte was not detected at level above the indicated reporting limit

BOLD - indicates that the concentration in the sample exceeds the respective detection limit (quantified value)

1. Most stringent PCUL derived for screening upland soil for purpose of comparison. Note that sediment deposited in lined pond (now removed) was comprised of concentrated solids from treatment of stormwater collected in the BLWA boat maintenance/wash areas.

Blue shaded cell indicates that the concentration in the sample exceeds listed PCUL

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-1										
			Date	8/28/18	2/19/20	9/8/22	12/8/22	4/11/23	6/6/23	9/26/23	12/13/23	4/10/24	6/25/24
Water Quality Parameters													
Specific Conductivity	--	mS/cm	0.364	0.856	0.364	0.779	0.796	0.796	0.610	1.218	0.986	1.282	
Turbidity	--	NTU	7.8	46.07	6.14	8.63	3.08	3.08	6.71	5.57	69.5	14.6	
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)													
Metals Method:			200.8/245.1	6020B	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	
Arsenic, Total	8	ug/L	NA	10.10	12.60	6.99	5.68	6.06	8.48	6.72	11.80	3.99	
Cadmium, Total	7.9	ug/L	NA	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.066 J	0.061 U	0.061 U	
Chromium, Total	50	ug/L	NA	1.52	10 U	1.72 U	1.72 U	1.72 U	1.72 U	1.72 U	1.72 U	1.72 U	
Copper, Total	3.1	ug/L	NA	3.74	7.33	14.3	1.39	2.47	2.80	3.37	3.63	1.87	
Lead, Total	8.1	ug/L	NA	1 U	1 U	1.83	0.082	0.199	0.225	0.484	0.422	0.167 J	
Mercury, Total	0.025	ug/L	NA	0.2 U	0.2 U	0.00271	0.00166	0.00246	0.00185	0.00207	0.0054	0.00137	
Nickel	8.2	ug/L	NA	1.57	NA	NA	NA	NA	2.04 J	4.91	2.91 J	6.77	
Zinc, Total	81	ug/L	NA	5 U	5 U	8.91 J	7.07 U	7.07 U	7.07 U	10.3 J	7.07 U	12.1 U	
Arsenic, Dissolved	8	ug/L	12	9.56	11.1	6.88	5.52	5.95	6.70	4.82	5.80	2.31	
Cadmium, Dissolved	7.9	ug/L	1 U	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	
Chromium, Dissolved	50	ug/L	2 U	1 U	10 U	1.72 U	1.72 U	1.72 U	1.72 U	1.82 J	1.72 U	1.72 U	
Copper, Dissolved	3.1	ug/L	8.0	2.5 U	5 U	2.25	5.40	15.8	1.69	1.45	0.659	1.05 J	
Lead, Dissolved	8.1	ug/L	1 U	1 U	1 U	0.282	0.319	1.96	0.061 U	0.061 U	0.061 U	0.091 U	
Mercury, Dissolved	0.025	ug/L	2 U	0.2 U	0.2 U	0.00064	0.00066	0.00261	0.00080	0.00035 J	0.00052	0.00093	
Nickel, Dissolved	8.2	ug/L	NA	0.2 U	NA	NA	NA	NA	1.76 J	4.80	2.39 J	6.57	
Zinc, Dissolved	81	ug/L	3.2	5 U	5 U	7.07 U	7.07 U	9.65 J	7.07 U	7.07 U	7.07 U	12.1 U	
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)													
NWTPH-Gx Gasoline Range	1,700	ug/L	50 U	NA	100 U	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range	see total	ug/L	180	160 x	77 x	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range	see total	ug/L	250 U	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx	2,100	ug/L	180	160	77	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx with SGC	2,100	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Benzene	1.6	ug/L	1 U	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Toluene	102	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Ethylbenzene	21	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Xylenes	--	ug/L	3 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA	
Naphthalene	4900	ug/L	0.02 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)													
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Equivalent (TEQ)	0.01	ug/L	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Volatile Organic Compounds (EPA 8260)													
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA	
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	0.0066	NA	NA	NA	NA	NA	
Dibutyltin	--	ug/L	NA	NA	NA	NA	0.0077 U	NA	NA	NA	NA	NA	
Butyltin	--	ug/L	NA	NA	NA	NA	0.0866	NA	NA	NA	NA	NA	
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	0.03 U	NA	NA	NA	NA	NA	
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	NA	NA	NA	NA	0.0007 J, B	NA	NA	NA	NA	NA	
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-2										
		Date	8/28/18	2/19/20	9/6/22	9/6/22	12/6/22	4/12/23	6/5/23	9/27/23	12/12/23	4/11/24	6/26/24
Water Quality Parameters													
Specific Conductivity	--	mS/cm	5.854	8.158	2.634	2.634	6.32	6.202	6.202	10.365	7.676	5.666	7.760
Turbidity	--	NTU	2.9	3.09	1.70	1.70	0.02	1.30	1.30	3.98	3.22	1.28	2.71
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)													
Metals Method:			200.8/245.1	6020B	1638/1631E	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	NA	7.47 J	0.38 J	4.92	0.48 J	0.40 J	0.45 J	0.46 J	0.56 J	0.22 J	0.27 J
Cadmium, Total	7.9	ug/L	NA	1 UJ	0.061 U	1 U	0.061 U	0.061 U	0.061 U	0.205	0.061 U	0.061 U	0.061 U
Chromium, Total	50	ug/L	NA	5.4	5.06 J	10 U	5.72 J	2.36 J	2.88 J	9.71	18.2	5.12 J	4.27 J
Copper, Total	3.1	ug/L	NA	3.505	1.56	5 U	9.60	2.99	4.33	16.1	6.31	2.23	5.87
Lead, Total	8.1	ug/L	NA	1 U	0.156	1 U	0.304	0.07 J	0.115 J	0.294	0.228	0.179	0.200
Mercury, Total	0.025	ug/L	NA	0.2 U	0.00165	0.2 U	0.0399	0.00204	0.00447	0.00278	0.00336	0.000565	0.00216
Nickel	8.2	ug/L	NA	4.35	NA	NA	NA	NA	NA	31.1	5.59	1.23 J	2.31 J
Zinc, Total	81	ug/L	NA	5 U	7.07 U	5 U	8.12 J	7.07 U	7.07 U	14.5 J	7.07 U	7.07 U	12.1 U
Arsenic, Dissolved	8	ug/L	1 U	8.155	0.308 J	3.76	0.455 J	0.444 J	0.382 J	0.343 J	0.46 J	0.162 U	0.299 J
Cadmium, Dissolved	7.9	ug/L	1 U	1 UJ	0.061 U	1 U	0.061 U	0.061 U	0.061 U	0.192	0.061 U	0.061 U	0.061 U
Chromium, Dissolved	50	ug/L	2 U	2.17	3.37	5.25	4.29 J	1.72 U	1.72 U	1.72 U	2.81 J	1.72 U	1.72 U
Copper, Dissolved	3.1	ug/L	2 U	2.5 U	1.03	5 U	4.21	1.46	2.51	3.04	3.45	0.51 U	2.56
Lead, Dissolved	8.1	ug/L	1 U	1 U	0.095	1 U	0.265	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.091 U
Mercury, Dissolved	0.025	ug/L	2 U	0.2 UJ	0.00120	0.2 U	0.0191	1.20	3.24	0.00087	0.00195	0.00013 U	0.00092
Nickel, Dissolved	8.2	ug/L	NA	4.6	NA	NA	NA	NA	NA	28.9	5.11	1.21 U	2.34 J
Zinc, Dissolved	81	ug/L	2.5 U	5 U	7.07 U	5 U	7.07 U	7.07 U	7.07 U	12.4 J	7.07 U	7.07 U	12.1 U
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)				115									
NWTPH-Gx Gasoline Range	1,700	ug/L	200	NA	100 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	210	115 x	220 x	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250 U	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	210	115	220	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	1 U	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	3 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.02 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)													
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)													
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	NA	0.0052 U	NA	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	NA	NA	0.0077 U	NA	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	NA	NA	0.0096	NA	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	NA	0.0300 U	NA	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^	5.7	pg/L	NA	NA	NA	NA	NA	0.04	NA	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-3										
		Date	8/28/18	2/19/20	9/7/22		12/6/22	4/10/23	6/5/23	9/25/23	12/14/23	1Q2024	2Q2024
Water Quality Parameters													
Specific Conductivity	--	mS/cm	4.839	6.611	13.176	13.176	23.4	6.215	6.215	20.965	34.712	NA	NA
Turbidity	--	NTU	2.8	31.66	6.17	6.17	23.7	2.30	2.30	4.35	30.4	NA	NA
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)													
Metals Method:			200.8/245.1	6020B	1638/1631E	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	NA	9.56	1.43	21.00	0.81	1.01	0.67	0.81	3.06	NA	NA
Cadmium, Total	7.9	ug/L	NA	1	1.10	10	1.55	0.156	0.592	2.07	4.12	NA	NA
Chromium, Total	50	ug/L	NA	73.8	53.2	56.3	17.0	4.5	3.0	24.3	99.9	NA	NA
Copper, Total	3.1	ug/L	NA	29.4	15.5	20.0	9.37	7.63	4.66	8.16	41.5	NA	NA
Lead, Total	8.1	ug/L	NA	9.42	5.89	10	2.30	0.943	0.700	2.65	16.7	NA	NA
Mercury, Total	0.025	ug/L	NA	0.2	0.0254	0.2	0.0145	0.0073	0.00717	0.01335	0.0981	NA	NA
Nickel	8.2	ug/L	NA	3.83	NA	NA	NA	NA	NA	61.35	21.3	NA	NA
Zinc, Total	81	ug/L	NA	53.9	250	135	336	63.1	169	403.5	728	NA	NA
Arsenic, Dissolved	8	ug/L	2.3	7.81	0.68	16.8	0.653	0.914	0.602	0.534	0.711	NA	NA
Cadmium, Dissolved	7.9	ug/L	1	1	1.06	10	1.52	0.105	0.553	2.01	4.14	NA	NA
Chromium, Dissolved	50	ug/L	5.0	2.56	3.82	3.72	3.88	1.72	1.72	1.72	4.81	NA	NA
Copper, Dissolved	3.1	ug/L	3.2	21.6	7.73	6.08	7.47	6.30	3.90	5.47	12.0	NA	NA
Lead, Dissolved	8.1	ug/L	1	1.71	0.193	10	0.444	0.061	0.102	0.262	0.595	NA	NA
Mercury, Dissolved	0.025	ug/L	2	0.2	0.00607	0.2	0.00787	0.00551	0.00544	0.00375	0.00714	NA	NA
Nickel, Dissolved	8.2	ug/L	NA	2.68	NA	NA	NA	NA	NA	55.7	17.7	NA	NA
Zinc, Dissolved	81	ug/L	9.8	47.8	239	100	322	58.0	160	401	738	NA	NA
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)													
NWTPH-Gx Gasoline Range	1,700	ug/L	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	130	50	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	250	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	250	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	1	0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	1	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	3	2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.02	1	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)													
Benzo(a)pyrene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)													
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	NA	0.0052	NA	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	NA	NA	0.0077	NA	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	NA	NA	0.0060	NA	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	NA	0.03	NA	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	NA	NA	NA	NA	NA	0.04	NA	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-4										
		Date	8/28/18	2/19/20	9/8/22	12/8/22	4/11/23	6/6/23	9/27/23	12/13/23	4/11/24	6/26/24	
Water Quality Parameters													
Specific Conductivity	--	mS/cm	0.351	0.885	0.287	0.374	1.118	1.118	0.605	0.681	0.895	0.821	
Turbidity	--	NTU	4.7	12.17	1.44	2.13	1.35	1.35	1.36	1.74	1.58	1.06	
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)													
Metals Method:			200.8/245.1	6020B	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	
Arsenic, Total	8	ug/L	NA	2.97	5.72	0.84	0.93	1.01	1.33	0.68	1.00	0.98	
Cadmium, Total	7.9	ug/L	NA	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	
Chromium, Total	50	ug/L	NA	4.43	10 U	2.43 J	1.84 J	3.03 J	1.72 U	10.9	6.16	2.85 J	
Copper, Total	3.1	ug/L	NA	10.9	11.5	4.92	3.655	6.31	4.45	3.54	4.90	4.14	
Lead, Total	8.1	ug/L	NA	4.02	1 U	0.678	0.4015	0.841	0.364	0.5135	1.28	0.756	
Mercury, Total	0.025	ug/L	NA	0.2 U	0.2 U	0.00108	0.001015	0.0024	0.00143	0.00091	0.00102	0.000110	
Nickel	8.2	ug/L	NA	10.4	NA	NA	NA	NA	3.72	18.3	5.05	4.07	
Zinc, Total	81	ug/L	NA	11.1	5.41	7.07 U	7.07 U	7.07 U	7.26 J	7.07 U	7.07 U	12.1 U	
Arsenic, Dissolved	8	ug/L	1.1	2.06	3.03	0.760	0.9345	0.943	1.42	0.683 J	0.920	0.920	
Cadmium, Dissolved	7.9	ug/L	1 U	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	
Chromium, Dissolved	50	ug/L	2 U	1.88	10 U	1.72 U	1.72 U	1.72 U	1.72 U	3.54 J	1.72 U	1.72 U	
Copper, Dissolved	3.1	ug/L	3.2	2.65	5 U	4.67	2.86	3.715	3.72	2.85	1.92	2.14	
Lead, Dissolved	8.1	ug/L	1 U	1 U	1 U	0.429	0.061 U	0.1055 J	0.061 U	1.47	0.061 U	0.091 U	
Mercury, Dissolved	0.025	ug/L	2 U	0.2 U	0.2 U	0.00053	0.00068	2.415	0.00090	0.00053	0.00013	0.00066	
Nickel, Dissolved	8.2	ug/L	NA	7.05	NA	NA	NA	NA	3.58 J	17.55	2.71	2.64	
Zinc, Dissolved	81	ug/L	3	5 U	5 U	7.07 U	7.07 U	7.07 U	7.07 U	7.07 U	7.07 U	12.1 U	
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)													
NWTPH-Gx Gasoline Range	1,700	ug/L	50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range	see total	ug/L	130 U	50 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range	see total	ug/L	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx	2,100	ug/L	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx with SGC	2,100	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Benzene	1.6	ug/L	1 U	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Toluene	102	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Ethylbenzene	21	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Xylenes	--	ug/L	3 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA	
Naphthalene	4900	ug/L	0.02 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)													
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Equivalent (TEQ)	0.01	ug/L	ND(<0.02)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Volatile Organic Compounds (EPA 8260)													
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA	
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	0.0137	0.193 U	NA	NA	0.193 U	NA	
Dibutyltin	--	ug/L	NA	NA	NA	NA	0.0077 U	0.289 U	NA	NA	0.289 U	NA	
Butyltin	--	ug/L	NA	NA	NA	NA	0.0686	0.204 U	NA	NA	0.204 U	NA	
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	0.03 U	0.3 U	NA	NA	0.3 U	NA	
Dioxins/Furans (EPA 1613) TEQ ^	5.7	pg/L	NA	NA	NA	NA	0.96	NA	NA	NA	NA	NA	
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-5										
		Date	8/29/18	2/19/20	9/7/22	12/7/22	4/12/23	6/7/23	9/27/23	12/12/23	4/10/24	6/25/24	
Water Quality Parameters													
Specific Conductivity	--	mS/cm	0.513	0.422	0.402	0.372	0.405	0.405	0.413	0.289	0.352	0.427	
Turbidity	--	NTU	48.0	22.34	28.0	30.7	11.0	11.0	15.6	13.7	63.7	41.4	
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)													
Metals Method: 200.8/245.1				6020B	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	NA	1.07	1.00 U	1.07	1.90	1.20	1.37	1.38	2.63	2.02	
Cadmium, Total	7.9	ug/L	NA	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	
Chromium, Total	50	ug/L	NA	1.48	1 U	3.38 J	2.2 J	1.72 U	1.72 U	4.44 J	8.55	4.93 J	
Copper, Total	3.1	ug/L	NA	5.87	5 U	19.8	9.59	5.93	4.26	25.2	21.4	18.4	
Lead, Total	8.1	ug/L	NA	1 U	1 U	1.14	0.801	0.575	0.265	1.30	5.09	3.09	
Mercury, Total	0.025	ug/L	NA	0.2 U	0.2 U	0.00694	0.00976	0.00759	0.00404	0.0117	0.0173	0.0121	
Nickel	8.2	ug/L	NA	3.52	NA	NA	NA	NA	2.58 J	5.89	10.9	7.32	
Zinc, Total	81	ug/L	NA	5.85	5 U	7.07 U	7.07 U	8.48 J	7.07 U	9.64 J	19.1 J	16.2 J	
Arsenic, Dissolved	8	ug/L	1.2	1 U	1 U	0.686 J	0.579 J	1.20	0.794	0.930	0.615 J	0.560 J	
Cadmium, Dissolved	7.9	ug/L	1 U	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	
Chromium, Dissolved	50	ug/L	2 U	1 U	1 U	1.72 U	1.72 U	1.72 U	1.72 U	2.07 J	1.72 U	1.72 U	
Copper, Dissolved	3.1	ug/L	2 U	3.07	5 U	13.5	5.24	5.93	2.28	22.3	10.1	8.60	
Lead, Dissolved	8.1	ug/L	1 U	1 U	1.67	0.201	0.061 U	0.575	0.061 U	0.086 J	0.061 U	0.091 U	
Mercury, Dissolved	0.025	ug/L	2 U	0.2 U	0.2 U	0.00013	0.00339	7.59	0.00169	0.00846	0.00174	0.00154	
Nickel, Dissolved	8.2	ug/L	NA	2.61	NA	NA	NA	NA	2.35 J	4.08	3.41 J	3.68	
Zinc, Dissolved	81	ug/L	2.5 U	5 U	5 U	7.07 U	7.07 U	8.48 J	7.07 U	7.07 U	7.07 U	12.1 U	
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)													
NWTPH-Gx Gasoline Range	1,700	ug/L	50 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range	see total	ug/L	130 U	50 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range	see total	ug/L	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx	2,100	ug/L	250 U	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
NWTPH-Dx with SGC	2,100	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Benzene	1.6	ug/L	1 U	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Toluene	102	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Ethylbenzene	21	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
EPA 8021 Xylenes	--	ug/L	3 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA	
Naphthalene	4900	ug/L	0.02 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)													
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
cPAH Equivalent (TEQ)	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Volatile Organic Compounds (EPA 8260)													
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA	
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	0.0052 U	NA	NA	NA	NA	NA	
Dibutyltin	--	ug/L	NA	NA	NA	NA	0.0077 U	NA	NA	NA	NA	NA	
Butyltin	--	ug/L	NA	NA	NA	NA	0.0157	NA	NA	NA	NA	NA	
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	0.03 U	NA	NA	NA	NA	NA	
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	NA	NA	NA	NA	0.10	NA	NA	NA	NA	NA	
Total Organic Carbon (SM 5310C)	--	ug/L	NA	4.66	NA	NA	NA	NA	NA	NA	NA	NA	

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-6									
		Date	8/29/18	2/19/20	9/6/22	12/7/22	4/12/23	6/7/23	9/26/23	12/12/23	4/10/24	6/25/24
Water Quality Parameters												
Specific Conductivity	--	mS/cm	0.513	0.352	0.153	0.17	0.197	0.197	0.180	0.150	0.212	0.233
Turbidity	--	NTU	381	3.76	12.8	2.7	0.9	0.9	1.3	6.3	0.14	4.39
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)												
Metals Method:			200.8/245.1	6020B	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	NA	1.00 U	1.00 U	0.18 J	0.21 J	0.20 J	0.21 J	0.20 J	0.28	0.22 U
Cadmium, Total	7.9	ug/L	NA	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U
Chromium, Total	50	ug/L	NA	1 U	10 U	3.93 J	2.04 J	1.72 U	1.72 U	1.81 J	1.72 U	1.72 U
Copper, Total	3.1	ug/L	NA	2.5 U	5 U	1.91	0.522 J	1.08	0.881 J	0.505 U	0.627	1.25 J
Lead, Total	8.1	ug/L	NA	1 U	1 U	0.237	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.091 U
Mercury, Total	0.025	ug/L	NA	0.2 U	0.2 U	0.00046	0.00046	0.00209	0.00063	0.00072	0.0003	0.00053
Nickel	8.2	ug/L	NA	1.99	NA	NA	NA	NA	1.21 U	1.21 U	1.21 U	1.21 U
Zinc, Total	81	ug/L	NA	5 U	5 U	7.07 U	7.07 U	7.07 U	7.07 U	7.07 U	7.07 U	12.1 U
Arsenic, Dissolved	8	ug/L	1 U	1 U	1 U	0.19 J	0.201 J	0.174 J	0.192 J	0.212 J	0.218	0.248 J
Cadmium, Dissolved	7.9	ug/L	1 U	1 U	1 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U
Chromium, Dissolved	50	ug/L	2 U	1 U	1.30	1.72 U	1.72 U	1.72 U	1.72 U	1.77 J	1.72 U	1.72 U
Copper, Dissolved	3.1	ug/L	2 U	2.5 U	5 U	2.13	0.505 U	0.712 J	1.11	0.841 J	0.659	1.2 J
Lead, Dissolved	8.1	ug/L	1 U	1 U	1 U	0.172	0.061 U	0.061 U	0.061 U	0.061 U	0.061 U	0.091 U
Mercury, Dissolved	0.025	ug/L	2 U	0.2 U	0.2 U	0.00031 J	0.00038 J	0.00163	0.00032 J	0.0003 J	0.00013 U	0.00058
Nickel, Dissolved	8.2	ug/L	NA	2.04	NA	NA	NA	NA	1.21 U	1.21 U	1.21 U	1.21 U
Zinc, Dissolved	81	ug/L	2.5 U	5.97	5 U	7.07 U	7.07 U	7.07 U	7.07 U	10.7 J	7.07 U	12.1 U
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)												
NWTPH-Gx Gasoline Range	1,700	ug/L	50 U	NA	100 U	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	130 U	50 U	50 U	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	50 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250 U	250 U	250 U	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	250 U	250 U	250 U	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	250 U	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	1 U	0.35 U	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	1 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	3 U	2 U	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.02 U	1 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)												
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	ND(<0.02)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)												
All 8260 Compounds	see Table 5-2	ug/L	NA	ND(<0.1,<50)	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	0.0052 U	NA	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	NA	0.0077 U	NA	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	NA	0.235	NA	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	0.03 U	NA	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	NA	NA	NA	NA	0.0013	NA	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	3.64	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-7								
		Date	9/7/22	9/7/22	12/7/22	4/11/23	6/6/23	9/26/23	12/13/23	4/11/24	6/26/24
Water Quality Parameters											
Specific Conductivity	--	mS/cm	34.935	34.935	36.2	38.750	38.750	38.723	27.189	34.192	39.724
Turbidity	--	NTU	5.01	5.01	22.4	14.50	14.50	12.60	14.2	52.6	8.14
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)											
Metals Method:			1638/1631E	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	1.19	48.05	0.96	0.59 J	0.72 J	0.91 J	0.21 J	1.88	1.02 J
Cadmium, Total	7.9	ug/L	1.25	10 U	0.921	1.67	1.96	1.83	0.061 U	1.11	1.01
Chromium, Total	50	ug/L	186.5	178	119	138	285	612	1.77 J	1030	150
Copper, Total	3.1	ug/L	11.8	50 U	13.5	36.8	20.1	33.3	0.841 J	29.9	13.1
Lead, Total	8.1	ug/L	0.881	10 U	3.42	3.45	7.26	9.13	0.061 U	22.4	5.72
Mercury, Total	0.025	ug/L	0.1195	0.2 U	0.018	0.0168	0.0168	0.0456	0.0003 J	0.0379	0.0235
Nickel	8.2	ug/L	NA	NA	NA	NA	NA	816	1.21 U	60.1	60.3
Zinc, Total	81	ug/L	401.5	323	478	699	620	637	10.7 J	562	464
Arsenic, Dissolved	8	ug/L	1.04	46.4	0.735	0.538 J	0.501 J	0.565 J	0.562 J	0.599 J	0.710 J
Cadmium, Dissolved	7.9	ug/L	1.26	10 U	0.959	1.67	1.83	1.89	0.061 U	1.16	1.12
Chromium, Dissolved	50	ug/L	119.5	107	7.31	8.17	17.1	63.3	18.2	12.4	10.8 J
Copper, Dissolved	3.1	ug/L	10.8	50 U	19.2	33.1	18.9	23.8	6.31	6.82	9.54
Lead, Dissolved	8.1	ug/L	0.3285	10 U	0.856	0.417	0.328	0.591	0.228	0.332	0.34 J
Mercury, Dissolved	0.025	ug/L	0.019	0.2 U	0.0117	0.0138	0.0143	0.0203	0.00336	0.00615	0.0103
Nickel, Dissolved	8.2	ug/L	NA	NA	NA	NA	NA	788	5.59	51.9	59.1
Zinc, Dissolved	81	ug/L	398.5	313	449	664	601	636	7.07 U	520	466
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)											
NWTPH-Gx Gasoline Range	1,700	ug/L	100 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	50 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)											
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)											
All 8260 Compounds	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	ND(<0.1, <1)	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	0.0052 U	NA	NA	0.0052 U	NA	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	0.0077 U	NA	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	0.0261	NA	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	0.03 U	NA	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	3.23	NA	1.53	0.0017	NA	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-8								
		Date	9/8/22	9/8/22	12/8/22	4/10/23	6/5/23	9/25/23	12/14/23	4/9/24	6/24/24
Water Quality Parameters											
Specific Conductivity	--	mS/cm	34.705	34.705	37.9	42.671	42.671	42.706	39.820	36.155	39.749
Turbidity	--	NTU	2.07	2.07	38.6	15.30	15.30	26.90	22.7	27.9	28.8
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)											
Metals Method:			1638/1631E	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	1.49	43.40	1.13	0.97	1.12	1.19 J	1.18 J	1.08 J	1.73 J
Cadmium, Total	7.9	ug/L	2.28	10	1.16	2.26	1.96	2.70	1.42	1.38	1.46
Chromium, Total	50	ug/L	64.4	65.4	98.1	277	177	2010	936	588	917
Copper, Total	3.1	ug/L	44.2	50	18.9	47.2	36.2	96.7	82.7	101	78.0
Lead, Total	8.1	ug/L	0.466	10	1.06	1.18	1.16	1.69	1.09	8.38	5.47
Mercury, Total	0.025	ug/L	0.0102	0.2	0.00991	0.0109	0.0137	0.0122	0.0121	0.0109	0.014
Nickel	8.2	ug/L	NA	NA	NA	NA	NA	799	547	328	386
Zinc, Total	81	ug/L	233	196	197	261	261	346	303	257	232
Arsenic, Dissolved	8	ug/L	1.54	46.7	0.973	0.756	0.977	0.881 J	0.945 J	0.743 J	0.892 J
Cadmium, Dissolved	7.9	ug/L	2.30	10	1.15	2.63	1.74	2.53	1.38	1.37	1.46
Chromium, Dissolved	50	ug/L	48.5	46.7	17.7	2.41 J	6.84	12.9 J	6.39 J	4.29 U	28.8
Copper, Dissolved	3.1	ug/L	57.1	50	18.5	21.2	25.3	76.1	28.2	43.4	45.6
Lead, Dissolved	8.1	ug/L	0.434	10	0.745	0.344	0.435	0.301 J	0.152 U	0.180	0.227 U
Mercury, Dissolved	0.025	ug/L	0.00878	0.2	0.00875	0.00782	0.0104	0.00868	0.00765	0.00531	0.00666
Nickel, Dissolved	8.2	ug/L	NA	NA	NA	NA	NA	689	521	294	381
Zinc, Dissolved	81	ug/L	242	190	208	275	240	327	219	233	227
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)											
NWTPH-Gx Gasoline Range	1,700	ug/L	100 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	50 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)											
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)											
All 8260 Compounds	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	ND(<0.1,<1)	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	0.00915	NA	0.0184	0.0547	0.193 U	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	0.0093	0.289 U	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	0.0750	0.2040 U	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	0.03 U	0.3 U	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^	5.7	pg/L	0.87	NA	1.48	0.04	89.77	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	MW-9								
		Date	9/6/22	9/6/22	12/6/22	4/10/23	6/7/23	9/25/23	12/14/23	4/9/24	6/24/24
Water Quality Parameters											
Specific Conductivity	--	mS/cm	37.987	37.987	47.1	45.734	45.734	43.766	42.628	41.255	45.272
Turbidity	--	NTU	2.12	2.12	3.81	1.48	1.48	1.44	1.55	1.74	1.65
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)											
Metals Method:			1638/1631E	6020B/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E	1638/1631E
Arsenic, Total	8	ug/L	1.79	53.60	1.77	1.77	1.84	2.11	1.97	1.34 J	1.89
Cadmium, Total	7.9	ug/L	0.485	10 U	0.343	0.387	0.987	0.524	0.862	0.373 J	0.334 J
Chromium, Total	50	ug/L	1.72 U	10 U	2.37 J	1.72 U	4.29 U	4.29 U	5.46 J	4.29 U	4.29 U
Copper, Total	3.1	ug/L	15.1	50 U	14.1	13.5	16.8	18.0	17.5	13.4	19.3
Lead, Total	8.1	ug/L	1.59	10 U	2.97	1.37	1.31	2.60	3.74	2.99	1.57
Mercury, Total	0.025	ug/L	0.155	0.2 U	0.042	0.0334	0.0404	0.206	0.0432	0.0379	0.0513
Nickel	8.2	ug/L	NA	NA	NA	NA	NA	3.03 U	6.7 J	3.03 U	3.03 U
Zinc, Total	81	ug/L	137	114	137	121	217	148	496	152	133
Arsenic, Dissolved	8	ug/L	1.88	53.6	1.48	1.58	2.01	1.98	1.73 J	1.84	2.08
Cadmium, Dissolved	7.9	ug/L	0.438	10 U	0.324	0.371	1.05	0.43 J	0.826	0.38 J	0.317 J
Chromium, Dissolved	50	ug/L	1.72 U	20.1	4.38 J	1.72 U	4.29 U	4.29 U	4.29 U	4.29 U	4.29 U
Copper, Dissolved	3.1	ug/L	14.5	100 U	11.4	10.7	17.2	15.4	13.1	10.9	15.9
Lead, Dissolved	8.1	ug/L	1.28	10 U	1.13	0.751	1.44	1.33	0.988	0.849	0.985
Mercury, Dissolved	0.025	ug/L	0.138	0.2 U	0.0394	0.029	0.0445	0.182	0.0385	0.0288	0.0415
Nickel, Dissolved	8.2	ug/L	NA	NA	NA	NA	NA	3.03 U	4.07	3.03 U	3.03 U
Zinc, Dissolved	81	ug/L	137	131	130	117	212	151	240	141	135
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)											
NWTPH-Gx Gasoline Range	1,700	ug/L	100 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	50 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx	2,100	ug/L	250 U	NA	NA	NA	NA	NA	NA	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)											
Benzo(a)pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.02	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	0.02 U	NA	NA	NA	NA	NA	NA	NA	NA
Volatile Organic Compounds (EPA 8260)											
All 8260 Compounds	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	ND(<0.1, <1)	NA	NA	NA	NA	NA	NA	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	0.0052 U	NA	NA	0.0107	0.193 U	NA	NA	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	0.0077 U	1.21	NA	NA	NA	NA
Butyltin	--	ug/L	NA	NA	NA	0.0556	0.682	NA	NA	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	0.03 U	0.3 U	NA	NA	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^	5.7	pg/L	3.16	NA	1.76	0.02	NA	NA	NA	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

	Most Stringent PCUL	Well ID	SPZ-1	SPZ-1	MP-1	SFD-4	SWP-1	BLWA-11	BLWA-13	AST-2	AST-2 (DUP)	AST-3	SRWA-9	SRWA-9	SRWA-10
		Date	6/25/24	7/30/24	7/30/24	7/25/22	7/25/22	7/25/22	7/27/22	7/26/22	7/26/22	7/28/22	7/26/22	7/26/22	7/28/22
Water Quality Parameters															
Specific Conductivity	--	mS/cm	45.431	32.621	31.372	NA	NA	NA	NA	0.550	0.550	1.952	NA	NA	NA
Turbidity	--	NTU	60.4	15.5	7.71	NA	NA	NA	NA	95.52	95.52	143	NA	NA	NA
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)															
Metals Method:			1638/1631E	1638/1631E	1638/1631E	1638	1638	1638	1638	1638	1638	1638	6020B, 1631E	1638	1638
Arsenic, Total	8	ug/L	2.41	5.03	3.36	39.60	52.70	12.30	6.51	6.37	NA	5.22	5.00 U	39.70	4.28
Cadmium, Total	7.9	ug/L	0.171 J	0.152 U	0.223 J	1.79	0.781	0.477	1.02	0.195	NA	0.378	1 U	1.55	0.186
Chromium, Total	50	ug/L	29.9	5.98	4.29 U	67.8	357	28.4	13.5	13.5	NA	24.1	2.85	631	21.9
Copper, Total	3.1	ug/L	40.6	15.2	23.6	520	1110	238	171	74.5	NA	139	5.37	617	63.7
Lead, Total	8.1	ug/L	54.6	13.4	7.24	115	89.2	50.9	70.6	12.9	NA	27.1	1 U	324	26.0
Mercury, Total	0.025	ug/L	0.117	0.0432	0.0172	0.376	0.253	0.0227	0.155	0.0783	NA	0.0282	0.022	2.88	0.0535
Nickel	8.2	ug/L	20.2	6.97	4.56	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc, Total	81	ug/L	35.8 J	30.3 U	183	199	511	134	502	12.3 J	NA	64.3	5 U	719	76.4
Arsenic, Dissolved	8	ug/L	1.46 J	3.19	2.01	11.5	0.241 J	4.25	2.88	2.28	NA	0.694 J	NA	0.366 J	0.237
Cadmium, Dissolved	7.9	ug/L	0.152 U	0.152 U	0.168 J	0.061 U	0.061 U	0.247 J	0.811	0.061 U	NA	0.061 U	NA	0.061 U	0.061 U
Chromium, Dissolved	50	ug/L	4.29 U	4.29 U	4.29 U	1.72 U	1.72 U	4.29 U	4.29 U	1.72 U	NA	5.03	NA	1.72 U	1.72 U
Copper, Dissolved	3.1	ug/L	2.27 U	2.27 U	9.69	8.46	1.91	2.63	76.9	0.698 J	NA	2.03	NA	4.68	3.47
Lead, Dissolved	8.1	ug/L	0.398 J	0.235	0.63	0.376	0.04 U	0.102 J	24.5	0.262	NA	0.98	NA	0.108 J	0.087 J
Mercury, Dissolved	0.025	ug/L	0.00013 U	0.00043	0.00071	0.00068	0.00063	0.00088	0.060	0.00032 J	NA	0.00098	NA	0.00265	0.0269
Nickel, Dissolved	8.2	ug/L	9.28	6.45	3.03 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc, Dissolved	81	ug/L	30.3 U	30.3 U	162	7.48 J	7.07 U	21.2 J	433	7.07 U	NA	7.07 U	NA	7.07 U	8.89 J
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)															
NWTPH-Gx Gasoline Range	1,700	ug/L	NA	NA	NA	100 U	NA	100 U	100 U	290	290	100 U	100 U	NA	NA
NWTPH-Dx Diesel Range	see total	ug/L	NA	NA	NA	160 x	NA	63 x	50 U	290 x	290 x	290 x	130 x	NA	NA
NWTPH-Dx Diesel Range with SGC	see total	ug/L	NA	NA	NA	50 U	NA	50 U	50 U	NA	NA	50 U	NA	NA	NA
NWTPH-Dx Oil Range	see total	ug/L	NA	NA	NA	250 U	NA	250 U	250 U	250 U	250 U	250 U	320 U	NA	NA
NWTPH-Dx Oil Range with SGC	see total	ug/L	NA	NA	NA	250 U	NA	250 U	250 U	NA	NA	250 U	NA	NA	NA
NWTPH-Dx	2,100	ug/L	NA	NA	NA	160 x	NA	63 x	250 U	290 x	290 x	290 x	130 x	NA	NA
NWTPH-Dx with SGC	2,100	ug/L	NA	NA	NA	250 U	NA	250 U	250 U	NA	NA	250 U	NA	NA	NA
EPA 8021 Benzene	1.6	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Toluene	102	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Ethylbenzene	21	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPA 8021 Xylenes	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4900	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)															
Benzo(a)pyrene	0.01	ug/L	NA	NA	NA	NA	NA	0.17	0.080	NA	NA	NA	0.02 U	NA	NA
Benzo(a)anthracene	0.01	ug/L	NA	NA	NA	NA	NA	0.2	0.068	NA	NA	NA	0.02 U	NA	NA
Benzo(b)fluoranthene	0.01	ug/L	NA	NA	NA	NA	NA	0.16 fb	0.13	NA	NA	NA	0.02 U	NA	NA
Benzo(k)fluoranthene	0.01	ug/L	NA	NA	NA	NA	NA	0.44	0.043	NA	NA	NA	0.02 U	NA	NA
Chrysene	0.02	ug/L	NA	NA	NA	NA	NA	0.53	0.069	NA	NA	NA	0.02 U	NA	NA
Dibenz(a,h)anthracene	0.01	ug/L	NA	NA	NA	NA	NA	0.03 fb	0.02 U	NA	NA	NA	0.02 U	NA	NA
Indeno[1,2,3-cd]pyrene	0.01	ug/L	NA	NA	NA	NA	NA	0.14 fb	0.074	NA	NA	NA	0.02 U	NA	NA
cPAH Equivalent (TEQ)	0.01	ug/L	NA	NA	NA	NA	NA	0.27	0.11	NA	NA	NA	0.02 U	NA	NA
Volatile Organic Compounds (EPA 8260)															
All 8260 Compounds	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	NA	NA	NA	NA	NA	0.1 U	NA	NA	NA	NA	0.1 U	NA	NA
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(<0.1,<1)	NA	NA
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0052 U	NA	NA
Dibutyltin	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0077 U	NA	NA
Butyltin	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0215	NA	NA
Tetrabutyltin	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.03 U	NA	NA
Dioxins/Furans (EPA 1613) TEQ ^	5.7	pg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	361.10	NA	NA
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 3-11. Summary of Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor

Water Quality Parameters	Most Stringent PCUL	Well ID	# Samples	# Detections	# Non-Detects	Detect Frequency	Max Concentration (ug/L)	# PCUL Exceedances	Exceedance Frequency	Max PCUL Exceedance Factor	
		Date									
	Specific Conductivity	--									mS/cm
	Turbidity	--									NTU
Total and Dissolved Metals (EPA 6020B, 1631E, 1638, EPA 200.8, 245.1)			# Samples	# Detections	# Non-Detects	Detect Frequency	Max Concentration (ug/L)	# PCUL Exceedances	Exceedance Frequency	Max PCUL Exceedance Factor	
Metals Method:											
Arsenic, Total	8	ug/L	93.00	88.00	5.00	94.6%	53.60	13	14%	6.7	
Cadmium, Total	7.9	ug/L	93	42	51	45.2%	10	4	4%	1.27	
Chromium, Total	50	ug/L	93	65	28	69.9%	2,010	24	26%	40.2	
Copper, Total	3.1	ug/L	93	85	8	91.4%	1,110	77	83%	358.1	
Lead, Total	8.1	ug/L	93	72	21	77.4%	324	19	20%	40.0	
Mercury, Total	0.025	ug/L	93	78	15	83.9%	2.9	38	41%	115.2	
Nickel	8.2	ug/L	43	35	8	81.4%	816	14	33%	99.51	
Zinc, Total	81	ug/L	93	57	36	61.3%	728	38	41%	8.99	
Arsenic, Dissolved	8	ug/L	98	91	7	92.9%	53.6	9	9%	6.70	
Cadmium, Dissolved	7.9	ug/L	98	34	64	34.7%	10	4	4%	1.27	
Chromium, Dissolved	50	ug/L	98	37	61	37.8%	119.5	3	3%	2.39	
Copper, Dissolved	3.1	ug/L	98	80	18	81.6%	100	61	62%	32.26	
Lead, Dissolved	8.1	ug/L	98	51	47	52.0%	24.5	5	5%	3.02	
Mercury, Dissolved	0.025	ug/L	98	75	23	76.5%	7.6	35	36%	303.6	
Nickel, Dissolved	8.2	ug/L	43	33	10	76.7%	788	12	28%	96.1	
Zinc, Dissolved	81	ug/L	98	47	51	48.0%	738	34	35%	9.11	
Total Petroleum Hydrocarbons (NWTPH-Dx) and BTEX (8021 and 8260)											
NWTPH-Gx Gasoline Range	1,700	ug/L	19	3	16	15.8%	290	0	0%	0.17	
NWTPH-Dx Diesel Range	see total	ug/L	25	12	13	48.0%	290	see total	see total	see total	
NWTPH-Dx Diesel Range with SGC	see total	ug/L	10	0	10	0%	50	see total	see total	see total	
NWTPH-Dx Oil Range	see total	ug/L	25	0	25	0%	320	see total	see total	see total	
NWTPH-Dx Oil Range with SGC	see total	ug/L	10	0	10	0%	250	see total	see total	see total	
NWTPH-Dx	2,100	ug/L	19	6	13	32%	250	19	100%	0.12	
NWTPH-Dx with SGC	2,100	ug/L	10	0	10	0%	250	10	100%	0.12	
EPA 8021 Benzene	1.6	ug/L	12	0	12	0%	1	0	0%	0.63	
EPA 8021 Toluene	102	ug/L	12	0	12	0%	1	0	0%	0.01	
EPA 8021 Ethylbenzene	21	ug/L	12	0	12	0%	1	0	0%	0.05	
EPA 8021 Xylenes	--	ug/L	12	0	12	0%	3	--	--	--	
Naphthalene	4900	ug/L	15	0	15	0%	1	0	0%	0.00	
cPAH Semi-Volatile Organic Compounds (EPA 8270D, 8270 SIM)											
Benzo(a)pyrene	0.01	ug/L	12	2	10	17%	0.17	12	100%	17.0	
Benzo(a)anthracene	0.01	ug/L	12	2	10	17%	0.20	12	100%	20.0	
Benzo(b)fluoranthene	0.01	ug/L	12	2	10	17%	0.16	12	100%	16.0	
Benzo(k)fluoranthene	0.01	ug/L	12	2	10	17%	0.44	12	100%	44.0	
Chrysene	0.02	ug/L	12	2	10	17%	0.53	12	100%	33.1	
Dibenz(a,h)anthracene	0.01	ug/L	12	1	11	8%	0.03	12	100%	3.0	
Indeno[1,2,3-cd]pyrene	0.01	ug/L	12	2	10	17%	0.14	12	100%	14.0	
cPAH Equivalent (TEQ)	0.01	ug/L	10	3	7	30%	0.27	10	100%	27.2	
Volatile Organic Compounds (EPA 8260)											
All 8260 Compounds	see Table 5-2	ug/L	0	0	0	0%	--	--	--	--	
Total PCB Aroclors (EPA 8082A)	0.1	ug/L	5	0	5	0%	0.10	0	0%	1.0	
Organochlorine Pesticides (EPA 8081B)	see Table 5-2	ug/L	0	0	0	0%	--	--	--	--	
Tributyltin (EPA 8270E-SIM)	0.0074	ug/L	18	6	12	33%	0.19	9	50%	26.1	
Dibutyltin	--	ug/L	14	2	12	14%	1.21	--	--	--	
Butyltin	--	ug/L	14	11	3	79%	0.68	--	--	--	
Tetrabutyltin	--	ug/L	14	0	14	0%		--	--	--	
Dioxins/Furans (EPA 1613) TEQ ^A	5.7	pg/L	17	17	0	100%	361.10	2	12%	63.4	
Total Organic Carbon (SM 5310C)	--	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	

**Table 3-11. Summary of Upland Groundwater Data
Jensen's Shipyard and Marina
Port of Friday Harbor**

Notes and Abbreviations:

NA - indicates value not available; not analyzed

BOLD - indicates that the concentration in the sample exceeds the respective reporting limit (quantified value)

Blue shaded cell indicates that the concentration in the sample exceeds the above listed applicable screening level.

Orange shaded cell indicates that the ND value exceeds the above listed applicable screening level.

Total cPAH is the sum of detected values based on the toxic equivalency factor (TEQ) per WAC 173- 340-708(8)(e)

^A - TEQ value with "0" used for non-detected compounds.

Where field duplicate value was higher, used higher value.

ug/L - micrograms per liter

ug/L - micrograms per liter

mS/cm - milliSiemens per centimeter

U - indicates that the value is a laboratory reporting limit

J - reported concentration is an estimate.

SGC - Silica Gel Cleanup

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

fb - The analyte was detected in the method blank.

Field duplicates detections are shown as an average with the parent sample detection.

cPAH - carcinogenic polycyclic aromatic hydrocarbons

Table 5-1. Preliminary Cleanup Levels for Soil
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical Analyte	Human Health		Marine Surface Water	TEE	Sediment	Most Stringent PCUL	Modifying Factors		Most Stringent PCUL	Basis for Preliminary Aggregate PCUL
			Method B, Direct Contact, Cancer	Method B, Direct Contact, Non-Cancer	Protective of Groundwater to Marine Surface Water, Vadose Zone	Simplified TEE for Industrial or Commercial Site	MTCA SMS Benthic SCO		Natural Background	Practical Quantitation Limit (PQL)		
Metals (mg/kg)	7440-38-2	Arsenic	6.7E-01	2.4E+01	2.9E+00	20	57	6.7E-01	7.3	0.2	7.30E+00	Natural Background
	7440-43-9	Cadmium	--	8.0E+01	1.1E+00	36	5.7	1.1E+00	0.77	0.2	1.10E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	7440-47-3	Chromium (III)	--	1.2E+05	4.9E+06	135	260	1.4E+02	48	1	1.35E+02	Simplified TEE for Industrial or Commercial Site
	7440-50-8	Copper	3.2E+03	--	1.4E+00	550	390	1.4E+00	36	1	3.60E+01	Natural Background
	7439-92-1	Lead	--	2.5E+02	1.6E+03	220	450	2.2E+02	24	0.2	2.20E+02	Simplified TEE for Industrial or Commercial Site
	7439-97-6	Mercury	--	--	2.6E-02	9	0.41	2.6E-02	0.07	0.2	2.00E-01	Practical Quantitation Limit (PQL)
	7440-02-0	Nickel	1.6E+03	--	1.1E+01	1,850	--	1.1E+01	48	0.2	4.80E+01	Natural Background
	7440-66-6	Zinc	2.4E+04	--	1.0E+02	570	410	1.0E+02	85	1	1.00E+02	Protective of Groundwater to Marine Surface Water, Vadose Zone
PCB Aroclors (mg/kg)	12674-11-2	1016	5.6E+00	1.4E+01	6.4E-03	--	--	6.4E-03	--	0.002	6.40E-03	Protective of Groundwater to Marine Surface Water, Vadose Zone
	11097-69-1	1254	1.6E+00	5.0E-01	2.7E-04	--	--	2.7E-04	--	0.002	2.00E-03	Practical Quantitation Limit (PQL)
	11096-82-5	1260	--	5.0E-01	--	--	--	5.0E-01	--	0.002	5.00E-01	Method B, Direct Contact, Non-Cancer
	1336-36-3	Total PCB Aroclors	--	5.0E-01	1.1E-05	2	0.13	1.1E-05	--	0.002	2.00E-03	Practical Quantitation Limit (PQL)
Dioxin/Furan Congeners (ng/kg)	1746-01-6	2,3,7,8 TCDD	9.3E-05	1.3E-05	2.5E-08	--	--	2.5E-08	5.2	5	5.20E+00	Natural Background
Petroleum Hydrocarbons (mg/kg)	--	Gasoline range	100	--	--	12,000	--	1.0E+02	--	5	1.00E+02	Method B, Direct Contact, Cancer
	--	Diesel range	2,000	--	--	15,000	--	2.0E+03	--	10	2.00E+03	Method B, Direct Contact, Cancer
	--	Oil range	2,000	--	--	--	--	2.0E+03	--	50	2.00E+03	Method B, Direct Contact, Cancer
	--	Total Diesel and Oil Range	2,000	--	--	--	--	2.0E+03	--	50	2.00E+03	Method B, Direct Contact, Cancer
cPAHs (mg/kg)	56-55-3	Benz[a]anthracene	--	--	--	--	1.3	--	--	0.02	--	see cPAH TEQ
	205-99-2	Benzo(b)fluoranthene	--	--	--	--	--	--	--	0.02	--	see cPAH TEQ
	207-08-9	Benzo(k)fluoranthene	--	--	--	--	--	--	--	0.02	--	see cPAH TEQ
	50-32-8	Benzo(a)pyrene	1.9E-01	2.4E+01	3.1E-04	300	1.6	3.1E-04	--	0.02	2.00E-02	Practical Quantitation Limit (PQL)
	218-01-9	Chrysene	--	--	--	--	1.4	--	--	0.02	--	see cPAH TEQ
	53-70-3	Dibenzo(a,h)anthracene	--	--	--	--	0.23	--	--	0.02	--	see cPAH TEQ
	193-39-5	Indeno(1,2,3-cd)pyrene	--	--	--	--	0.6	--	--	0.02	--	see cPAH TEQ
	--	Total cPAH TEQ	1.9E-01	2.4E+01	3.1E-04	--	1.6	3.1E-04	--	0.02	2.00E-02	Practical Quantitation Limit (PQL)
Other PAHs (mg/kg)	83-32-9	Acenaphthene	4.8E+03	--	3.1E+00	--	0.5	5.0E-01	--	0.002	5.00E-01	MTCA SMS Benthic SCO
	120-12-7	Anthracene	2.4E+04	--	4.7E+01	--	0.96	9.6E-01	--	0.002	9.60E-01	MTCA SMS Benthic SCO
	191-24-2	Benzo(g,h,i)perylene	--	--	--	--	0.67	6.7E-01	--	0.002	6.70E-01	MTCA SMS Benthic SCO
	132-64-9	Dibenzofuran	8.0E+01	--	--	--	--	8.0E+01	--	0.01	8.00E+01	Method B, Direct Contact, Cancer
	206-44-0	Fluoranthene	3.2E+03	--	5.9E+00	--	--	5.9E+00	--	0.002	5.90E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	86-73-7	Fluorene	3.2E+03	--	1.6E+00	--	0.54	5.4E-01	--	0.002	5.40E-01	MTCA SMS Benthic SCO
	90-12-0	1-Methylnaphthalene	5.6E+03	2.0E+01	--	--	--	2.0E+01	--	0.002	2.00E+01	Method B, Direct Contact, Non-Cancer
	91-57-6	2-Methylnaphthalene	3.2E+02	--	--	--	0.67	6.7E-01	--	0.002	6.70E-01	MTCA SMS Benthic SCO
	91-20-3	Naphthalene	1.6E+03	--	1.4E+02	--	2.1	2.1E+00	--	0.002	2.10E+00	MTCA SMS Benthic SCO
	85-01-8	Phenanthrene	--	--	--	--	1.5	--	--	0.002	--	--
	129-00-0	Pyrene	2.4E+03	--	1.1E+01	--	2.6	2.6E+00	--	0.002	2.60E+00	MTCA SMS Benthic SCO

Table 5-1. Preliminary Cleanup Levels for Soil
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical Analyte	Human Health		Marine Surface Water	TEE	Sediment	Most Stringent PCUL	Modifying Factors		Most Stringent PCUL	Basis for Preliminary Aggregate PCUL
			Method B, Direct Contact, Cancer	Method B, Direct Contact, Non-Cancer	Protective of Groundwater to Marine Surface Water, Vadose Zone	Simplified TEE for Industrial or Commercial Site	MTCA SMS Benthic SCO		Natural Background	Practical Quantitation Limit (PQL)		
Other SVOCs (mg/kg)	62-53-3	Aniline	5.6E+02	1.8E+02	--	--	--	1.8E+02	--	0.5	1.80E+02	Method B, Direct Contact, Non-Cancer
	103-33-3	Azobenzene	--	9.1E+00	--	--	--	9.1E+00	--	0.5	9.10E+00	Method B, Direct Contact, Non-Cancer
	92-87-5	Benzidine	2.4E+02	8.2E-04	6.4E-07	--	--	6.4E-07	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	65-85-0	Benzoic acid	3.2E+05	--	--	--	0.65	6.5E-01	--	0.5	6.50E-01	MTCA SMS Benthic SCO
	100-51-6	Benzyl alcohol	8.0E+03	--	--	--	0.57	5.7E-01	--	0.1	5.70E-01	MTCA SMS Benthic SCO
	111-91-1	Bis(2-chloroethoxy)methane	2.4E+02	--	--	--	--	2.4E+02	--	0.01	2.40E+02	Method B, Direct Contact, Cancer
	111-44-4	Bis(2-chloroethyl)ether	--	9.1E-01	3.3E-04	--	--	3.3E-04	--	0.025	2.50E-02	Practical Quantitation Limit (PQL)
	542-88-1	Bis(chloromethyl)ether	--	4.5E-03	7.4E-05	--	--	7.4E-05	--	0.025	2.50E-02	Practical Quantitation Limit (PQL)
	108-60-1	Bis(2-chloro-1-methylethyl)ether	3.2E+03	1.4E+01	2.1E+00	--	--	2.1E+00	--	0.01	2.10E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	117-81-7	Bis(2-ethylhexyl) phthalate	1.6E+03	7.1E+01	1.0E-01	--	1.3	1.0E-01	--	0.16	1.60E-01	Practical Quantitation Limit (PQL)
	85-68-7	Butyl benzyl phthalate	1.6E+04	5.3E+02	3.6E-03	--	0.063	3.6E-03	--	0.03	3.00E-02	Practical Quantitation Limit (PQL)
	106-47-8	4-Chloroaniline	3.2E+02	5.0E+00	--	--	--	5.0E+00	--	1	5.00E+00	Method B, Direct Contact, Non-Cancer
	59-50-7	4-Chloro-3-methylphenol (chlorocresol)	8.0E+03	--	5.0E-01	--	--	5.0E-01	--	0.13	5.00E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	91-58-7	2-Chloronaphthalene (beta-)	6.4E+03	--	5.4E+00	--	--	5.4E+00	--	0.13	5.40E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	95-57-8	2-Chlorophenol	4.0E+02	--	2.0E-01	--	--	2.0E-01	--	0.1	2.00E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	84-74-2	Dibutyl phthalate	8.0E+03	--	2.8E-01	200	1.4	2.8E-01	--	0.03	2.80E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	95-50-1	1,2-Dichlorobenzene	7.2E+03	--	9.3E+00	--	0.035	3.5E-02	--	0.01	3.50E-02	MTCA SMS Benthic SCO
	541-73-1	1,3-Dichlorobenzene	--	--	2.3E-02	--	--	2.3E-02	--	0.01	2.30E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	106-46-7	1,4-Dichlorobenzene	5.6E+03	1.9E+02	3.3E+00	--	0.11	1.1E-01	--	0.01	1.10E-01	MTCA SMS Benthic SCO
	91-94-1	3,3'-Dichlorobenzidine	--	2.2E+00	2.2E-04	--	--	2.2E-04	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	120-83-2	2,4-Dichlorophenol	2.4E+02	--	6.9E-02	--	--	6.9E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	103-23-1	Di(2-ethylhexyl)adipate	4.8E+04	8.3E+02	--	--	--	8.3E+02	--	0.1	8.30E+02	Method B, Direct Contact, Non-Cancer
	84-66-2	Diethyl phthalate	6.4E+04	--	1.1E+00	--	0.2	2.0E-01	--	0.1	2.00E-01	MTCA SMS Benthic SCO
	131-11-3	Dimethyl phthalate	--	--	2.8E+00	--	0.071	7.1E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	105-67-9	2,4-Dimethylphenol	1.6E+03	--	1.3E+00	--	0.029	2.9E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	528-29-0	1,2-Dinitrobenzene	8.0E+00	--	--	--	--	8.0E+00	--	0.1	8.00E+00	Method B, Direct Contact, Cancer
	99-65-0	1,3-Dinitrobenzene	8.0E+00	--	--	--	--	8.0E+00	--	0.1	8.00E+00	Method B, Direct Contact, Cancer
	100-25-4	1,4-Dinitrobenzene	8.0E+00	--	--	--	--	8.0E+00	--	0.1	8.00E+00	Method B, Direct Contact, Cancer
	534-52-1	4,6-Dinitro-o-cresol (DNOC)	6.4E+00	--	1.3E-01	--	--	1.3E-01	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	51-28-5	2,4-Dinitrophenol	1.6E+02	--	4.0E-01	--	--	4.0E-01	--	0.3	4.00E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	121-14-2	2,4-Dinitrotoluene	1.6E+02	3.2E+00	2.8E-03	--	--	2.8E-03	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	606-20-2	2,6-Dinitrotoluene	2.4E+01	6.7E-01	--	--	--	6.7E-01	--	0.05	6.70E-01	Method B, Direct Contact, Non-Cancer
	117-84-0	Di-n-octyl phthalate	8.0E+02	--	--	--	6.2	6.2E+00	--	0.1	6.20E+00	MTCA SMS Benthic SCO
	123-91-1	1,4-Dioxane	2.4E+03	1.0E+01	--	--	--	1.0E+01	--	0.1	1.00E+01	Method B, Direct Contact, Non-Cancer
	122-66-7	1,2-Diphenylhydrazine	--	1.3E+00	6.8E-04	--	--	6.8E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	118-74-1	Hexachlorobenzene	6.4E+01	6.3E-01	8.0E-06	31	0.022	8.0E-06	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	87-68-3	Hexachlorobutadiene	8.0E+01	1.3E+01	2.1E-04	--	0.011	2.1E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	77-47-4	Hexachlorocyclopentadiene	4.8E+02	--	3.2E-02	--	--	3.2E-02	--	0.03	3.20E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	67-72-1	Hexachloroethane	5.6E+01	2.5E+01	1.6E-04	--	--	1.6E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	78-59-1	Isophorone	1.6E+04	1.1E+03	5.8E-01	--	--	5.8E-01	--	0.01	5.80E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	95-48-7	2-Methylphenol (o-cresol)	4.0E+03	--	--	--	0.063	6.3E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	108-39-4	3-Methylphenol (m-cresol)	4.0E+03	--	--	--	--	4.0E+03	--	0.1	4.00E+03	Method B, Direct Contact, Cancer
	106-44-5	4-Methylphenol (p-cresol)	8.0E+03	--	--	--	0.67	6.7E-01	--	0.1	6.70E-01	MTCA SMS Benthic SCO
	88-74-4	2-Nitroaniline	8.0E+02	--	--	--	--	8.0E+02	--	0.05	8.00E+02	Method B, Direct Contact, Cancer
	100-01-6	4-Nitroaniline	3.2E+02	5.0E+01	--	--	--	5.0E+01	--	1	5.00E+01	Method B, Direct Contact, Non-Cancer
	98-95-3	Nitrobenzene	1.6E+02	--	6.4E-01	--	--	6.4E-01	--	0.01	6.40E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	62-75-9	n-Nitrosodimethylamine	6.4E-01	3.7E-03	1.5E-03	--	--	1.5E-03	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	86-30-6	n-Nitrosodiphenylamine	--	2.0E+02	3.9E-02	--	0.028	2.8E-02	--	0.01	2.80E-02	MTCA SMS Benthic SCO
	621-64-7	n-Nitrosodi-n-propylamine	--	1.4E-01	5.5E-04	--	--	5.5E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	87-86-5	Pentachlorophenol	4.0E+02	2.5E+00	3.2E-05	11	0.36	3.2E-05	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	108-95-2	Phenol	2.4E+04	--	5.4E+02	--	0.42	4.2E-01	--	0.1	4.20E-01	MTCA SMS Benthic SCO
	110-86-1	Pyridine	8.0E+01	--	--	--	--	8.0E+01	--	0.1	8.00E+01	Method B, Direct Contact, Cancer
	58-90-2	2,3,4,6-Tetrachlorophenol	2.4E+03	--	--	--	--	2.4E+03	--	0.0063	2.40E+03	Method B, Direct Contact, Cancer
	120-82-1	1,2,4-Trichlorobenzene	8.0E+02	3.4E+01	1.4E-03	--	0.031	1.4E-03	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	95-95-4	2,4,5-Trichlorophenol	8.0E+03	--	2.2E+01	--	--	2.2E+01	--	0.1	2.20E+01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	88-06-2	2,4,6-Trichlorophenol	8.0E+01	9.1E+01	3.3E-03	--	--	3.3E-03	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)

Table 5-1. Preliminary Cleanup Levels for Soil
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical Analyte	Human Health		Marine Surface Water	TEE	Sediment	Most Stringent PCUL	Modifying Factors		Most Stringent PCUL	Basis for Preliminary Aggregate PCUL
			Method B, Direct Contact, Cancer	Method B, Direct Contact, Non-Cancer	Protective of Groundwater to Marine Surface Water, Vadose Zone	Simplified TEE for Industrial or Commercial Site	MTCA SMS Benthic SCO		Natural Background	Practical Quantitation Limit (PQL)		
VOCs (mg/kg)	67-64-1	Acetone	7.2E+04	--	--	--	--	7.2E+04	--	5	7.20E+04	Method B, Direct Contact, Cancer
	107-02-8	Acrolein	4.0E+01	--	4.4E-03	--	--	4.4E-03	--	0.02	2.00E-02	Practical Quantitation Limit (PQL)
	107-13-1	Acrylonitrile	8.0E+01	1.9E+00	1.2E-04	--	--	1.2E-04	--	0.02	2.00E-02	Practical Quantitation Limit (PQL)
	100-52-7	Benzaldehyde	8.0E+03	2.5E+02	--	--	--	2.5E+02	--	0.02	2.50E+02	Method B, Direct Contact, Non-Cancer
	71-43-2	Benzene	3.2E+02	1.8E+01	8.8E-03	--	--	8.8E-03	--	0.02	2.00E-02	Practical Quantitation Limit (PQL)
	108-86-1	Bromobenzene	6.4E+02	--	--	--	--	6.4E+02	--	0.05	6.40E+02	Method B, Direct Contact, Cancer
	75-25-2	Bromoform	1.6E+03	1.3E+02	7.8E-02	--	--	7.8E-02	--	0.05	7.80E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	74-83-9	Bromomethane	1.1E+02	--	4.4E+00	--	--	4.4E+00	--	0.5	4.40E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	111-76-2	2-Butoxyethanol (EGBE)	8.0E+03	--	--	--	--	8.0E+03	--	0.05	8.00E+03	Method B, Direct Contact, Cancer
	104-51-8	n-Butylbenzene	4.0E+03	--	--	--	--	4.0E+03	--	0.05	4.00E+03	Method B, Direct Contact, Cancer
	135-98-8	sec-Butylbenzene	8.0E+03	--	--	--	--	8.0E+03	--	0.05	8.00E+03	Method B, Direct Contact, Cancer
	98-06-6	tert-Butylbenzene	8.0E+03	--	--	--	--	8.0E+03	--	0.05	8.00E+03	Method B, Direct Contact, Cancer
	75-15-0	Carbon disulfide	8.0E+03	--	--	--	--	8.0E+03	--	0.05	8.00E+03	Method B, Direct Contact, Cancer
	56-23-5	Carbon tetrachloride	3.2E+02	1.4E+01	2.9E-03	--	--	2.9E-03	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	108-90-7	Chlorobenzene	1.6E+03	--	1.7E+00	--	--	1.7E+00	--	0.05	1.70E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	75-00-3	Chloroethane	--	--	--	--	--	0.0E+00	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	67-66-3	Chloroform	8.0E+02	3.2E+01	2.9E+00	--	--	2.9E+00	--	0.05	2.90E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	74-87-3	Chloromethane	--	--	--	--	--	0.0E+00	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	107-05-1	3-Chloro-1-propene (allyl chloride)	--	4.8E+01	--	--	--	4.8E+01	--	0.5	4.80E+01	Method B, Direct Contact, Non-Cancer
	95-49-8	2-Chlorotoluene	1.6E+03	--	--	--	--	1.6E+03	--	0.05	1.60E+03	Method B, Direct Contact, Cancer
	106-43-4	4-Chlorotoluene	1.6E+03	--	--	--	--	1.6E+03	--	0.05	1.60E+03	Method B, Direct Contact, Cancer
	124-48-1	Dibromochloromethane	1.6E+03	1.2E+01	1.0E-02	--	--	1.0E-02	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	96-12-8	1,2-Dibromo-3-chloropropane	1.6E+01	2.3E-01	--	--	--	2.3E-01	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	74-95-3	Dibromomethane	8.0E+02	--	--	--	--	8.0E+02	--	0.05	8.00E+02	Method B, Direct Contact, Cancer
	75-27-4	Dichlorobromomethane	1.6E+03	1.6E+01	1.3E-02	--	--	1.3E-02	--	0.001	1.30E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	75-71-8	Dichlorodifluoromethane	1.6E+04	--	--	--	--	1.6E+04	--	0.5	1.60E+04	Method B, Direct Contact, Cancer
	75-34-3	1,1-Dichloroethane	1.6E+04	1.8E+02	--	--	--	1.8E+02	--	0.002	1.80E+02	Method B, Direct Contact, Non-Cancer
	107-06-2	1,2-Dichloroethane (EDC)	4.8E+02	1.1E+01	3.5E-01	--	--	3.5E-01	--	0.002	3.50E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	75-35-4	1,1-Dichloroethylene	4.0E+03	--	2.6E+01	--	--	2.6E+01	--	0.001	2.60E+01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	156-59-2	cis-1,2-Dichloroethylene	1.6E+02	--	--	--	--	1.6E+02	--	0.001	1.60E+02	Method B, Direct Contact, Cancer
	156-60-5	trans-1,2-Dichloroethylene	1.6E+03	--	5.2E+00	--	--	5.2E+00	--	0.001	5.20E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	78-87-5	1,2-Dichloropropane	3.2E+03	2.7E+01	1.6E-02	--	--	1.6E-02	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	142-28-9	1,3-Dichloropropane	1.6E+03	--	--	--	--	1.6E+03	--	0.05	1.60E+03	Method B, Direct Contact, Cancer
	10061-01-5	cis-1,3-Dichloropropene	--	--	--	--	--	0.0E+00	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	10061-02-6	trans-1,3-Dichloropropene	--	--	--	--	--	0.0E+00	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	100-41-4	Ethylbenzene	8.0E+03	--	1.8E-01	--	--	1.8E-01	--	0.02	1.80E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	60-29-7	Ethyl ether	1.6E+04	--	--	--	--	1.6E+04	--	0.001	1.60E+04	Method B, Direct Contact, Cancer
	106-93-4	Ethylene dibromide (EDB)	7.2E+02	5.0E-01	--	--	--	5.0E-01	--	0.001	5.00E-01	Method B, Direct Contact, Non-Cancer
	50-00-0	Formaldehyde	1.6E+04	8.9E+00	--	--	--	8.9E+00	--	0.001	8.90E+00	Method B, Direct Contact, Non-Cancer
	110-54-3	n-Hexane	4.8E+03	--	--	--	--	4.8E+03	--	0.001	4.80E+03	Method B, Direct Contact, Cancer
	591-78-6	2-Hexanone	4.0E+02	--	--	--	--	4.0E+02	--	0.5	4.00E+02	Method B, Direct Contact, Cancer
	98-82-8	Isopropylbenzene (cumene)	8.0E+03	--	--	--	--	8.0E+03	--	0.5	8.00E+03	Method B, Direct Contact, Cancer
	78-93-3	Methyl ethyl ketone (2-butanone)	4.8E+04	--	--	--	--	4.8E+04	--	0.5	4.80E+04	Method B, Direct Contact, Cancer
	108-10-1	Methyl isobutyl ketone	6.4E+03	--	--	--	--	6.4E+03	--	0.5	6.40E+03	Method B, Direct Contact, Cancer
	1634-04-4	Methyl tert-butyl ether (MTBE)	--	5.6E+02	--	--	--	5.6E+02	--	0.5	5.60E+02	Method B, Direct Contact, Non-Cancer
	75-09-2	Methylene chloride	4.8E+02	9.4E+01	4.3E-01	--	--	4.3E-01	--	0.2	4.30E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	103-65-1	n-Propylbenzene	8.0E+03	--	--	--	--	8.0E+03	--	0.05	8.00E+03	Method B, Direct Contact, Cancer
	100-42-5	Styrene	1.6E+04	--	--	--	--	1.6E+04	--	0.05	1.60E+04	Method B, Direct Contact, Cancer
	630-20-6	1,1,1,2-Tetrachloroethane	2.4E+03	3.8E+01	--	--	--	3.8E+01	--	0.05	3.80E+01	Method B, Direct Contact, Non-Cancer
	79-34-5	1,1,2,2-Tetrachloroethane	1.6E+03	5.0E+00	1.7E-03	--	--	1.7E-03	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	127-18-4	Tetrachloroethylene (PCE)	4.8E+02	4.8E+02	2.9E-02	--	--	2.9E-02	--	0.001	2.90E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	109-99-9	Tetrahydrofuran	7.2E+04	--	--	--	--	7.2E+04	--	0.001	7.20E+04	Method B, Direct Contact, Cancer
	108-88-3	Toluene	6.4E+03	--	7.2E-01	--	--	7.2E-01	--	0.02	7.20E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone
	87-61-6	1,2,3-Trichlorobenzene	6.4E+01	--	--	--	--	6.4E+01	--	0.25	6.40E+01	Method B, Direct Contact, Cancer
	71-55-6	1,1,1-Trichloroethane	1.6E+05	--	3.7E+02	--	--	3.7E+02	--	0.002	3.70E+02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	79-00-5	1,1,2-Trichloroethane	3.2E+02	1.8E+01	5.0E-03	--	--	5.0E-03	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	79-01-6	Trichloroethylene (TCE)	4.0E+01	1.2E+01	4.4E-03	--	--	4.4E-03	--	0.001	4.40E-03	Protective of Groundwater to Marine Surface Water, Vadose Zone
	75-69-4	Trichlorofluoromethane	2.4E+04	--	--	--	--	2.4E+04	--	0.5	2.40E+04	Method B, Direct Contact, Cancer
	96-18-4	1,2,3-Trichloropropane	3.2E+02	6.3E-03	--	--	--	6.3E-03	--	0.05	5.00E-02	Practical Quantitation Limit (PQL)
	76-13-1	Trichlorotrifluoroethane	2.4E+06	--	--	--	--	2.4E+06	--	0.001	2.40E+06	Method B, Direct Contact, Cancer
	526-73-8	1,2,3-Trimethylbenzene	8.0E+02	--	--	--	--	8.0E+02	--	0.05	8.00E+02	Method B, Direct Contact, Cancer
	95-63-6	1,2,4-Trimethylbenzene	8.0E+02	--	--	--	--	8.0E+02	--	0.05	8.00E+02	Method B, Direct Contact, Cancer
	108-67-8	1,3,5-Trimethylbenzene	8.0E+02	--	--	--	--	8.0E+02	--	0.05	8.00E+02	Method B, Direct Contact, Cancer

Table 5-1. Preliminary Cleanup Levels for Soil
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical Analyte	Human Health		Marine Surface Water	TEE	Sediment	Most Stringent PCUL	Modifying Factors		Most Stringent PCUL	Basis for Preliminary Aggregate PCUL
			Method B, Direct Contact, Cancer	Method B, Direct Contact, Non-Cancer	Protective of Groundwater to Marine Surface Water, Vadose Zone	Simplified TEE for Industrial or Commercial Site	MTCA SMS Benthic SCO		Natural Background	Practical Quantitation Limit (PQL)		
	108-05-4	Vinyl acetate	8.0E+04	--	--	--	--	8.0E+04	--	0.05	8.00E+04	Method B, Direct Contact, Cancer
	75-01-4	Vinyl chloride	2.4E+02	6.7E-01	1.1E-03	--	--	1.1E-03	--	0.002	2.00E-03	Practical Quantitation Limit (PQL)
	1330-20-7	Total xylenes	1.6E+04	--	9.4E-01	--	--	9.4E-01	--	0.002	9.40E-01	Protective of Groundwater to Marine Surface Water, Vadose Zone

Table 5-1. Preliminary Cleanup Levels for Soil
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical Analyte	Human Health		Marine Surface Water	TEE	Sediment	Most Stringent PCUL	Modifying Factors		Most Stringent PCUL	Basis for Preliminary Aggregate PCUL
			Method B, Direct Contact, Cancer	Method B, Direct Contact, Non-Cancer	Protective of Groundwater to Marine Surface Water, Vadose Zone	Simplified TEE for Industrial or Commercial Site	MTCA SMS Benthic SCO		Natural Background	Practical Quantitation Limit (PQL)		
Pesticides (mg/kg)	309-00-2	Aldrin	2.4E+00	5.9E-02	4.0E-08	0.17	--	4.0E-08	--	0.002	1.70E-03	Practical Quantitation Limit (PQL)
	319-84-6	alpha-BHC (alpha-HCH)	7.2E+01	1.6E-01	1.9E-06	--	--	1.9E-06	--	0.002	1.70E-03	Practical Quantitation Limit (PQL)
	319-85-7	beta-BHC (beta-HCH)	--	5.6E-01	6.5E-05	--	--	6.5E-05	--	0.002	1.70E-03	Practical Quantitation Limit (PQL)
	63-25-2	Carbaryl	8.0E+03	--	1.8E-02	--	--	1.8E-02	--	0.002	1.80E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	5103-71-9	cis-Chlordane (alpha)	4.0E+01	--	--	--	--	4.0E+01	--	0.002	4.00E+01	Method B, Direct Contact, Cancer
	5103-74-2	trans-Chlordane (gamma)	4.0E+01	--	--	--	--	4.0E+01	--	0.002	4.00E+01	Method B, Direct Contact, Cancer
	57-74-9	Chlordane	--	--	--	1	--	1.0E+00	--	0.002	1.00E+00	Simplified TEE for Industrial or Commercial Site
	2921-88-2	Chlorpyrifos	8.0E+01	--	8.4E-04	--	--	8.4E-04	--	0.002	1.70E-03	Practical Quantitation Limit (PQL)
	72-54-8	DDD	4.0E+01	4.2E+00	7.3E-06	--	--	7.3E-06	--	0.010	1.00E-02	Practical Quantitation Limit (PQL)
	72-55-9	DDE	4.0E+01	2.9E+00	1.5E-06	--	--	1.5E-06	--	0.010	1.00E-02	Practical Quantitation Limit (PQL)
	50-29-3	DDT	4.0E+01	2.9E+00	1.6E-05	--	--	1.6E-05	--	0.010	1.00E-02	Practical Quantitation Limit (PQL)
	--	Total DDT/DDD/DDE	--	--	--	1	--	1.0E+00		0.010	1.00E+00	Simplified TEE for Industrial or Commercial Site
	333-41-5	Diazinon	5.6E+01	--	5.3E-02	--	--	5.3E-02	--	0.003	5.30E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	60-57-1	Dieldrin	4.0E+00	6.3E-02	3.6E-08	--	--	3.6E-08	--	0.003	3.30E-03	Practical Quantitation Limit (PQL)
	959-98-8	Endosulfan I	--	--	1.2E-03	--	--	1.2E-03	--	0.003	3.30E-03	Practical Quantitation Limit (PQL)
	33213-65-9	Endosulfan II	--	--	1.2E-03	--	--	1.2E-03	--	0.003	3.30E-03	Practical Quantitation Limit (PQL)
	1031-07-8	Endosulfan sulfate	4.8E+02	--	2.0E+00	--	--	2.0E+00	--	0.003	2.00E+00	Protective of Groundwater to Marine Surface Water, Vadose Zone
	72-20-8	Endrin	2.4E+01	--	4.4E-04	0.4	--	4.4E-04	--	0.003	3.30E-03	Practical Quantitation Limit (PQL)
	7421-93-4	Endrin aldehyde	--	--	2.4E-03	--	--	2.4E-03	--	0.003	3.30E-03	Practical Quantitation Limit (PQL)
	76-44-8	Heptachlor	4.0E+01	2.2E-01	6.6E-08	--	--	6.6E-08	--	0.0001	1.00E-04	Practical Quantitation Limit (PQL)
	1024-57-3	Heptachlor epoxide	1.0E+00	1.1E-01	4.9E-07	--	--	4.9E-07	--	0.0001	1.00E-04	Practical Quantitation Limit (PQL)
	58-89-9	Lindane (gamma-BHC)	2.4E+01	9.1E-01	5.0E-03	--	--	5.0E-03	--	0.0005	5.00E-03	Protective of Groundwater to Marine Surface Water, Vadose Zone
	121-75-5	Malathion	1.6E+03	--	4.6E-04	--	--	4.6E-04	--	0.0001	4.60E-04	Protective of Groundwater to Marine Surface Water, Vadose Zone
	72-43-5	Methoxychlor	4.0E+02	--	3.2E-02	--	--	3.2E-02	--	0.017	3.20E-02	Protective of Groundwater to Marine Surface Water, Vadose Zone
	2385-85-5	Mirex	1.6E+01	5.6E-02	7.1E-03	--	--	7.1E-03	--	0.003	7.10E-03	Protective of Groundwater to Marine Surface Water, Vadose Zone
	8001-35-2	Toxaphene	7.2E+00	9.1E-01	6.1E-05	--	--	6.1E-05	--	1	1.00E+00	Practical Quantitation Limit (PQL)
Organotins (mg/kg)	1461-22-9	Tributyltin	--	--	1.7E-03	--	--	1.7E-03	--	0.00386	3.86E-03	Practical Quantitation Limit (PQL)

Notes and Abbreviations:

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

ECY - Washington Department of Ecology

pCULs - preliminary cleanup levels

MTCA - Model Toxics Control Act

NRWQC - National Recommended Water Quality Criteria

ng/kg - Nanogram per kilogram

mg/kg - Milligram per kilogram

TEE - Terrestrial Ecological Evaluation

WAC - Washington Administrative Code

1. Soil PCULs protective of human health and groundwater are from Ecology's January 2025 Master CLARC Table

2. Soil TEE criteria are from MTCA Table 749-2 and apply to soil in top 6 ft below ground surface only.

3. Soil criteria protective of marine sediment via erosion pathway apply to erodible surface soil only and are based on the sediment cleanup objectives (SCOs) based on dry-weight apparent effects thresholds (AETs) for Marine Sediment per Ecology's Sediment Cleanup Users Manual (SCUM) Table 8-1

4. Lead PCUL for protection of human health is based on MTCA Method A Value in absence of a Method B value.

Table 6-1. Soil Contaminants of Interest
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group ¹	Chemical Analyte	Most Stringent PCUL	Maximum Detected Concentration	Site COI?
Metals (mg/kg)	Arsenic	0.67	150	yes
	Cadmium	1.1	57	yes
	Chromium	135	350	yes
	Copper	1.4	9,300	yes
	Lead	24	10,000	yes
	Mercury	0.026	13	yes
	Nickel	48	16.6	no
	Zinc	100	7,100	yes
PCB Aroclors (mg/kg)	Total PCB Aroclors	0.002 ²	14.0	yes
Dioxin/Furan Congeners (ng/kg)	Total Dioxin/Furan TEQ	0.5 ²	102.5	yes
Petroleum Hydrocarbons (mg/kg)	Gasoline range	30/100	37	no
	Diesel range	2000	8,000	yes
	Oil range	2000	10,000	yes
	Total Diesel and Oil Range	2000	18,000	yes
BTEX (mg/kg)	Benzene		<0.03	no
	Toluene		<0.05	no
	Ethylbenzene		<0.05	no
	Xylenes		<0.20	no
cPAHs (mg/kg)	Benz[a]anthracene	--	1.2	see Total cPAH TEQ
	Benzo(b)fluoranthene	--	1.4	see Total cPAH TEQ
	Benzo(k)fluoranthene	--	0.3	see Total cPAH TEQ
	Benzo(a)pyrene	0.002	1.1	yes
	Chrysene	--	1.3	see Total cPAH TEQ
	Dibenzo(a,h)anthracene	--	0.2	see Total cPAH TEQ
	Indeno(1,2,3-cd)pyrene	--	0.8	see Total cPAH TEQ
	Total cPAH TEQ	0.002	1.45	yes
Other PAHs (mg/kg)	Acenaphthene	3.1	0.1	no
	Anthracene	47	0.4	no
	Benzo(g,h,i)perylene	--	1.0	no
	Fluorene	1.6	0.1	no
	1-Methylnaphthalene	20	0.9	no
	2-Methylnaphthalene	320	1.2	no
	Naphthalene	140	0.1	no
	Phenanthrene	--	1.2	no
	Pyrene	11	1.9	no
VOCs (mg/kg)	N-Propyl Benzene	8,000	0.017	no
	1,3,5-Trimethylbenzene	800	0.240	no
	1,2,4-Trimethylbenzene	800	0.610	no
	S-Butyl benzene	8,000	0.033	no
	N- Butylbenzene	4,000	0.055	no
	Tetrachloroethylene	0.029	0.017	no
Pesticides (mg/kg)	DDD	0.01	0.04	yes
	DDE	0.01	<0.01	no
	DDT	0.01	0.06	yes
	Total DDT/DDD/DDE	0.01	0.1	no
Organotins (ug/kg)	Tributyltin	3.86 ²	56	yes

Notes and Abbreviations:

1. Compounds that were not detected above practical quantitation limits are not listed including BTEX, other SVOCs, and other

2. PCUL has been adjusted up to the PQL.

mg/kg - milligrams per kilogram

ug/kg - micrograms per kilogram

ng/kg - nanograms per kilogram

Table 5-2. Preliminary Cleanup Levels for Groundwater
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical	Protection of Human Health (Surface Water) (µg/L)					Protection of Marine Aquatic Life (Surface Water) (µg/L)				Minimum of Surface Water Values	Modifying Factors (µg/L)		Most Stringent Criteria for Protection of Marine Surface Water pCUL	Basis
			Surface Water Method B Noncancer (Eq. 730-1)	Surface Water Method B Cancer (Eq. 730-2)	WA State WQC Human Health Consumption of Organisms 173-201A WAC	WTR Human Health Consumption of Organisms 40 CFR 131.45	NRWQC Human Health Consumption of Organisms CWA §304	WA State WQC Aquatic Life Marine/Acute 173-201A WAC	NRWQC Aquatic Life Marine/Acute CWA §304	WA State WQC Aquatic Life Marine/Chronic 173-201A WAC	NRWQC Aquatic Life Marine/Chronic CWA §304		Natural Background	Practical Quantitation Limit (PQL)		
Metals (µg/L)	7440-38-2	Arsenic	1.8E+01	9.8E-02	1.4E-01	1.4E-01	1.4E-01	6.9E+01	6.9E+01	3.6E+01	3.6E+01	9.8E-02	8.0E+00	0.072	8.00E+00	Natural Background
	7440-43-9	Cadmium	4.1E+01	--	--	--	--	4.2E+01	3.3E+01	9.3E+00	7.9E+00	7.9E+00	--	0.018	7.90E+00	NRWQCAquatic LifeMarine/Chronic CWA §304
	7440-47-3	Chromium, total	--	--	--	--	--	--	--	--	--	--	--	1.72	5.00E+01	MTCA Method A
	7440-50-8	Copper	2.9E+03	--	--	--	--	4.8E+00	4.8E+00	3.1E+00	3.1E+00	3.1E+00	--	0.18	3.10E+00	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	7439-92-1	Lead	--	--	--	--	--	2.1E+02	2.1E+02	8.1E+00	8.1E+00	8.1E+00	--	0.018	8.10E+00	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	7439-97-6	Mercury	--	--	--	--	--	1.8E+00	1.8E+00	2.5E-02	9.4E-01	2.5E-02	--	0.00041	2.50E-02	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	7440-02-0	Nickel	1.1E+03	--	1.0E+02	1.0E+02	4.6E+03	7.4E+01	7.4E+01	8.2E+00	8.2E+00	8.2E+00	--	0.36	8.20E+00	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	7440-66-6	Zinc	1.7E+04	--	1.0E+03	1.0E+03	2.6E+04	9.0E+01	9.0E+01	8.1E+01	8.1E+01	8.1E+01	--	2.4	8.10E+01	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
PCB Aroclors (µg/L)	1336-36-3	Total PCB Aroclors	--	1.0E-04	--	7.0E-06	6.4E-05	1.0E+01	--	3.0E-02	3.0E-02	7.0E-06	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
Dioxin/Furan Congeners (µg/L)	1746-01-6	2,3,7,8 TCDD	3.6E-07	1.0E-08	6.4E-08	--	5.1E-09	--	--	--	--	5.1E-09	--	0.0000057	5.70E-06	Practical Quantitation Limit (PQL)
Petroleum Hydrocarbons (µg/L)	86290-81-5	Gasoline range	--	--	--	--	--	--	--	1.7E+03	--	1.7E+03	--	100	1.70E+03	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	68476-34-6	Diesel range	--	--	--	--	--	--	--	2.1E+03	--	2.1E+03	--	100	2.10E+03	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
cPAHs (µg/L)	56-55-3	Benzo[a]anthracene	--	--	1.6E-04	1.6E-04	1.3E-03	--	--	--	--	1.6E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	205-99-2	Benzo(b)fluoranthene	--	--	1.6E-04	1.6E-04	1.3E-03	--	--	--	--	1.6E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	207-08-9	Benzo(k)fluoranthene	--	--	1.6E-03	1.6E-03	1.3E-02	--	--	--	--	1.6E-03	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	50-32-8	Benzo(a)pyrene	2.6E+01	3.5E-02	1.6E-05	1.6E-05	1.3E-04	--	--	--	--	1.6E-05	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	218-01-9	Chrysene	--	--	1.6E-02	1.6E-02	1.3E-01	--	--	--	--	1.6E-02	--	0.01	1.60E-02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	53-70-3	Dibenzo(a,h)anthracene	--	--	1.6E-05	1.6E-05	1.3E-04	--	--	--	--	1.6E-05	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	193-39-5	Indeno(1,2,3-cd)pyrene	--	--	1.6E-04	1.6E-04	1.3E-03	--	--	--	--	1.6E-04	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
	--	Total cPAH TEQ	2.6E+01	3.5E-02	1.6E-05	1.6E-05	1.3E-04	--	--	--	--	1.6E-05	--	0.01	1.00E-02	Practical Quantitation Limit (PQL)
Other PAHs (µg/L)	83-32-9	Acenaphthene	6.4E+02	--	3.0E+01	3.0E+01	9.0E+01	--	--	--	--	3.0E+01	--	0.01	3.00E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	120-12-7	Anthracene	2.6E+04	--	1.0E+02	1.0E+02	4.0E+02	--	--	--	--	1.0E+02	--	0.01	1.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	206-44-0	Fluoranthene	9.0E+01	--	6.0E+00	6.0E+00	2.0E+01	--	--	--	--	6.0E+00	--	0.01	6.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	86-73-7	Fluorene	3.5E+03	--	1.0E+01	1.0E+01	7.0E+01	--	--	--	--	1.0E+01	--	0.01	1.00E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	91-20-3	Naphthalene	4.9E+03	--	--	--	--	--	--	--	--	4.9E+03	--	0.1	4.90E+03	SurfaceWaterMethod BNoncancer(Eq. 730-1)
	129-00-0	Pyrene	2.6E+03	--	8.0E+00	8.0E+00	3.0E+01	--	--	--	--	8.0E+00	--	0.01	8.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	111-44-4	Bis(2-chloroethyl)ether	--	8.5E-01	6.0E-02	--	2.2E+00	--	--	--	--	6.0E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	108-60-1	Bis(2-chloro-1-methylethyl)ether	4.2E+04	3.7E+01	9.0E+02	9.0E+02	4.0E+03	--	--	--	--	3.7E+01	--	0.25	3.70E+01	SurfaceWaterMethod B Cancer(Eq. 730-2)
Other SVOCs (µg/L)	117-81-7	Bis(2-ethylhexyl) phthalate	4.0E+02	3.6E+00	4.6E-02	4.6E-02	3.7E-01	--	--	--	--	4.6E-02	--	1.6	1.60E+00	Practical Quantitation Limit (PQL)
	85-68-7	Butyl benzyl phthalate	1.3E+03	8.2E+00	1.3E-02	1.3E-02	1.0E-01	--	--	--	--	1.3E-02	--	1	1.00E+00	Practical Quantitation Limit (PQL)
	59-50-7	4-Chloro-3-methylphenol (chlorocresol)	--	--	3.6E+01	--	2.0E+03	--	--	--	--	3.6E+01	--	10	3.60E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	91-58-7	2-Chloronaphthalene (beta-)	1.0E+03	--	1.0E+02	1.0E+02	1.0E+03	--	--	--	--	1.0E+02	--	1	1.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	95-57-8	2-Chlorophenol	9.7E+01	--	1.7E+01	--	8.0E+02	--	--	--	--	1.7E+01	--	0.1	1.70E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	84-74-2	Dibutyl phthalate	2.9E+03	--	8.0E+00	8.0E+00	3.0E+01	--	--	--	--	8.0E+00	--	1	8.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	95-50-1	1,2-Dichlorobenzene	4.2E+03	--	8.0E+02	8.0E+02	3.0E+03	--	--	--	--	8.0E+02	--	0.1	8.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	541-73-1	1,3-Dichlorobenzene	--	--	2.0E+00	2.0E+00	1.0E+01	--	--	--	--	2.0E+00	--	0.1	2.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	106-46-7	1,4-Dichlorobenzene	3.3E+03	2.2E+01	2.0E+02	2.0E+02	9.0E+02	--	--	--	--	2.2E+01	--	0.1	2.20E+01	SurfaceWaterMethod B Cancer(Eq. 730-2)
	91-94-1	3,3'-Dichlorobenzidine	--	4.6E-02	3.3E-03	--	1.5E-01	--	--	--	--	3.3E-03	--	2	2.00E+00	Practical Quantitation Limit (PQL)
	120-83-2	2,4-Dichlorophenol	1.9E+02	--	1.0E+01	1.0E+01	6.0E+01	--	--	--	--	1.0E+01	--	1	1.00E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	84-66-2	Diethyl phthalate	2.8E+04	--	2.0E+02	2.0E+02	6.0E+02	--	--	--	--	2.0E+02	--	1	2.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	131-11-3	Dimethyl phthalate	--	--	6.0E+02	6.0E+02	2.0E+03	--	--	--	--	6.0E+02	--	1	6.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	105-67-9	2,4-Dimethylphenol	5.5E+02	--	9.7E+01	--	3.0E+03	--	--	--	--	9.7E+01	--	3	9.70E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	534-52-1	4,6-Dinitro-o-cresol (DNOC)	--	--	7.0E+00	7.0E+00	3.0E+01	--	--	--	--	7.0E+00	--	0.1	7.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	51-28-5	2,4-Dinitrophenol	3.5E+03	--	1.0E+02	1.0E+02	3.0E+02	--	--	--	--	1.0E+02	--	0.5	1.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	121-14-2	2,4-Dinitrotoluene	1.4E+03	5.5E+00	1.8E-01	--	1.7E+00	--	--	--	--	1.8E-01	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	122-66-7	1,2-Diphenylhydrazine	--	3.3E-01	2.0E-02	2.0E-02	2.0E-01	--	--	--	--	2.0E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	118-74-1	Hexachlorobenzene	2.4E-01	4.7E-04	5.0E-06	5.0E-06	7.9E-05	--	--	--	--	5.0E-06	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	87-68-3	Hexachlorobutadiene	9.3E+02	3.0E+01	1.0E-02	1.0E-02	1.0E-02	--	--	--	--	1.0E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	77-47-4	Hexachlorocyclopentadiene	3.6E+03	--	1.0E+00	1.0E+00	4.0E+00	--	--	--	--	1.0E+00	--	0.3	1.00E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	67-72-1	Hexachloroethane	2.1E+01	1.9E+00	2.0E-02	2.0E-02	1.0E-01	--	--	--	--	2.0E-02	--	0.1	1.00E-01	NRWQC Human Health Consumption of Organisms CWA §304
	78-59-1	Isophorone	1.2E+05	1.6E+03	1.1E+02	--	1.8E+03	--	--	--	--	1.1E+02	--	0.1	1.10E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	98-95-3	Nitrobenzene	1.8E+03	--	1.0E+02	1.0E+02	6.0E+02	--	--	--	--	1.0E+02	--	0.1	1.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	62-75-9	n-Nitrosodimethylamine	8.0E+02	8.0E-01	3.4E-01	--	3.0E+00	--	--	--	--	3.4E-01	--	0.1	3.40E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	86-30-6	n-Nitrosodiphenylamine	--	9.7E+00	6.9E-01	--	6.0E+00	--	--	--	--	6.9E-01	--	0.1	6.90E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	621-64-7	n-Nitrosodi-n-propylamine	--	8.2E-01	5.8E-02	--	5.1E-01	--	--	--	--	5.8E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	87-86-5	Pentachlorophenol	1.2E+03	1.5E+00	2.0E-03	2.0E-03	4.0E-02	1.3E+01	1.3E+01	7.9E+00	7.9E+00	2.0E-03	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)

Table 5-2. Preliminary Cleanup Levels for Groundwater
Jensen's Shipyard and Marina
Port of Friday Harbor

Parameter Group	CAS #	Chemical	Protection of Human Health (Surface Water) (µg/L)					Protection of Marine Aquatic Life (Surface Water) (µg/L)				Minimum of Surface Water Values	Modifying Factors (µg/L)		Most Stringent Criteria for Protection of Marine Surface Water pCUL	Basis
			Surface Water Method B Noncancer (Eq. 730-1)	Surface Water Method B Cancer (Eq. 730-2)	WA State WQC Human Health Consumption of Organisms 173-201A WAC	WTR Human Health Consumption of Organisms 40 CFR 131.45	NRWQC Human Health Consumption of Organisms CWA §304	WA State WQC Aquatic Life Marine/Acute 173-201A WAC	NRWQC Aquatic Life Marine/Acute CWA §304	WA State WQC Aquatic Life Marine/Chronic 173-201A WAC	NRWQC Aquatic Life Marine/Chronic CWA §304		Natural Background	Practical Quantitation Limit (PQL)		
	108-95-2	Phenol	5.6E+05	--	7.0E+04	7.0E+04	3.0E+05	--	--	--	--	7.0E+04	--	1	7.00E+04	WA State WQC Human Health Consumption of Organisms173-201A WAC
	120-82-1	1,2,4-Trichlorobenzene	2.3E+02	2.0E+00	3.7E-02	3.7E-02	7.6E-02	--	--	--	--	3.7E-02	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
	95-95-4	2,4,5-Trichlorophenol	--	--	--	--	6.0E+02	--	--	--	--	6.0E+02	--	1	6.00E+02	NRWQC Human Health Consumption of Organisms CWA §304
	88-06-2	2,4,6-Trichlorophenol	1.7E+01	3.9E+00	2.8E-01	--	2.8E+00	--	--	--	--	2.8E-01	--	1	1.00E+00	Practical Quantitation Limit (PQL)
	71-43-2	Benzene	2.0E+03	2.3E+01	1.6E+00	--	1.6E+01	--	--	--	--	1.6E+00	--	1	1.60E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	75-25-2	Bromoform	1.4E+04	2.2E+02	1.2E+01	1.2E+01	1.2E+02	--	--	--	--	1.2E+01	--	5	1.20E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	74-83-9	Bromomethane	9.7E+02	--	2.4E+03	--	1.0E+04	--	--	--	--	9.7E+02	--	5	9.70E+02	SurfaceWaterMethod BNoncancer(Eq. 730-1)
	56-23-5	Carbon tetrachloride	5.5E+02	4.9E+00	3.5E-01	--	5.0E+00	--	--	--	--	3.5E-01	--	0.5	5.00E-01	Practical Quantitation Limit (PQL)
	108-90-7	Chlorobenzene	5.0E+03	--	2.0E+02	2.0E+02	8.0E+02	--	--	--	--	2.0E+02	--	1	2.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	67-66-3	Chloroform	6.9E+03	5.6E+01	6.0E+02	6.0E+02	2.0E+03	--	--	--	--	5.6E+01	--	1	5.60E+01	SurfaceWaterMethod B Cancer(Eq. 730-2)
	124-48-1	Dibromochloromethane	1.4E+04	2.1E+01	2.2E+00	2.2E+00	2.1E+01	--	--	--	--	2.2E+00	--	0.5	2.20E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	75-27-4	Dichlorobromomethane	1.4E+04	2.8E+01	2.8E+00	2.8E+00	2.7E+01	--	--	--	--	2.8E+00	--	0.5	2.80E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	107-06-2	1,2-Dichloroethane (EDC)	1.3E+04	5.9E+01	7.3E+01	7.3E+01	6.5E+02	--	--	--	--	5.9E+01	--	0.2	5.90E+01	SurfaceWaterMethod B Cancer(Eq. 730-2)
	75-35-4	1,1-Dichloroethylene	2.3E+04	--	4.0E+03	4.0E+03	2.0E+04	--	--	--	--	4.0E+03	--	1	4.00E+03	WA State WQC Human Health Consumption of Organisms173-201A WAC
	156-60-5	trans-1,2-Dichloroethylene	3.3E+04	--	1.0E+03	1.0E+03	4.0E+03	--	--	--	--	1.0E+03	--	1	1.00E+03	WA State WQC Human Health Consumption of Organisms173-201A WAC
	78-87-5	1,2-Dichloropropane	2.5E+04	4.3E+01	3.1E+00	--	3.1E+01	--	--	--	--	3.1E+00	--	1	3.10E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	100-41-4	Ethylbenzene	6.9E+03	--	3.1E+01	3.1E+01	1.3E+02	--	--	--	--	3.1E+01	--	1	3.10E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	75-09-2	Methylene chloride	1.7E+04	5.9E+02	1.0E+02	1.0E+02	1.0E+03	--	--	--	--	1.0E+02	--	5	1.00E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	79-34-5	1,1,2,2-Tetrachloroethane	1.0E+04	6.5E+00	3.0E-01	3.0E-01	3.0E+00	--	--	--	--	3.0E-01	--	0.2	3.00E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	127-18-4	Tetrachloroethylene (PCE)	5.0E+02	1.0E+02	2.9E+00	2.9E+00	2.9E+01	--	--	--	--	2.9E+00	--	1	2.90E+00	WA State WQC Human Health Consumption of Organisms173-201A WAC
	108-88-3	Toluene	1.9E+04	--	1.3E+02	1.3E+02	5.2E+02	--	--	--	--	1.3E+02	--	1	1.30E+02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	71-55-6	1,1,1-Trichloroethane	9.3E+05	--	5.0E+04	5.0E+04	2.0E+05	--	--	--	--	5.0E+04	--	1	5.00E+04	WA State WQC Human Health Consumption of Organisms173-201A WAC
	79-00-5	1,1,2-Trichloroethane	2.3E+03	2.5E+01	9.0E-01	9.0E-01	8.9E+00	--	--	--	--	9.0E-01	--	0.5	9.00E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	79-01-6	Trichloroethylene (TCE)	1.2E+02	4.9E+00	7.0E-01	7.0E-01	7.0E+00	--	--	--	--	7.0E-01	--	0.5	7.00E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	75-01-4	Vinyl chloride	6.6E+03	3.7E+00	1.8E-01	1.8E-01	1.6E+00	--	--	--	--	1.8E-01	--	0.02	1.80E-01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	1330-20-7	Total xylenes	--	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	--
	309-00-2	Aldrin	1.7E-02	8.2E-05	4.1E-08	4.1E-08	7.7E-07	7.1E-01	1.3E+00	1.9E-03	--	4.1E-08	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	319-84-6	alpha-BHC (alpha-HCH)	1.8E+01	7.9E-03	4.8E-05	4.8E-05	3.9E-04	--	--	--	--	4.8E-05	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	319-85-7	beta-BHC (beta-HCH)	--	2.8E-02	1.4E-03	1.4E-03	1.4E-02	--	--	--	--	1.4E-03	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	63-25-2	Carbaryl	--	--	--	--	--	--	1.6E+00	--	--	1.6E+00	--	0.005	1.60E+00	NRWQC Aquatic LifeMarine/Acute CWA §304
	12789-03-6	Chlordane	--	--	2.2E-05	--	--	--	--	--	--	2.2E-05	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	2921-88-2	Chlorpyrifos	--	--	--	--	--	1.1E-02	1.1E-02	5.6E-03	5.6E-03	5.6E-03	--	0.005	5.60E-03	WA State WQCAquatic LifeMarine/Chronic173-201A WAC
	72-54-8	DDD	2.4E-02	5.0E-04	7.9E-06	7.9E-06	1.2E-04	--	--	--	--	7.9E-06	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	72-55-9	DDE	2.4E-02	3.6E-04	8.8E-07	8.8E-07	1.8E-05	--	--	--	--	8.8E-07	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	50-29-3	DDT	2.4E-02	3.6E-04	1.2E-06	1.2E-06	3.0E-05	1.3E-01	1.3E-01	1.0E-03	1.0E-03	1.2E-06	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	333-41-5	Diazinon	--	--	--	--	--	--	8.2E-01	--	--	8.2E-01	--	0.005	8.20E-01	NRWQC Aquatic LifeMarine/Acute CWA §304
	60-57-1	Dieldrin	2.8E-02	8.7E-05	7.0E-08	7.0E-08	1.2E-06	7.1E-01	7.1E-01	1.9E-03	1.9E-03	7.0E-08	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	959-98-8	Endosulfan I	--	--	7.0E+00	7.0E+00	3.0E+01	--	3.4E-02	--	--	8.7E-03	--	0.005	8.70E-03	NRWQCAquatic LifeMarine/Chronic CWA §304
	33213-65-9	Endosulfan II	--	--	1.0E+01	--	4.0E+01	--	3.4E-02	--	--	8.7E-03	--	0.005	8.70E-03	NRWQCAquatic LifeMarine/Chronic CWA §304
	1031-07-8	Endosulfan sulfate	--	--	1.0E+01	--	4.0E+01	--	--	--	--	1.0E+01	--	0.005	1.00E+01	WA State WQC Human Health Consumption of Organisms173-201A WAC
	72-20-8	Endrin	2.0E-01	--	2.0E-03	2.0E-03	3.0E-02	3.7E-02	3.7E-02	2.3E-03	2.3E-03	2.0E-03	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	7421-93-4	Endrin aldehyde	--	--	3.5E-02	--	1.0E+00	--	--	--	--	3.5E-02	--	0.005	3.50E-02	WA State WQC Human Health Consumption of Organisms173-201A WAC
	76-44-8	Heptachlor	1.2E-01	1.3E-04	3.4E-07	3.4E-07	5.9E-06	5.3E-02	5.3E-02	3.6E-03	3.6E-03	3.4E-07	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	1024-57-3	Heptachlor epoxide	3.0E-03	6.4E-05	2.4E-06	2.4E-06	3.2E-05	--	5.3E-02	--	--	3.6E-03	--	0.005	5.00E-03	Practical Quantitation Limit (PQL)
	58-89-9	Lindane (gamma-BHC)	6.0E+00	4.5E-02	4.3E-01	4.3E-01	4.4E+00	1.6E-01	1.6E-01	--	--	4.5E-02	--	0.005	4.50E-02	SurfaceWaterMethod B Cancer(Eq. 730-2)
	72-43-5	Methoxychlor	8.4E+00	--	--	--	2.0E-02	--	--	--	--	2.0E-02	--	0.005	2.00E-02	NRWQC Human Health Consumption of Organisms CWA §304
	2385-85-5	Mirex	--	--	--	--	--	--	--	--	--	1.0E-03	--	0.0025	2.50E-03	Practical Quantitation Limit (PQL)
	8001-35-2	Toxaphene	1.8E-02	4.5E-04	3.2E-05	--	7.1E-04	2.1E-01	2.1E-01	2.0E-04	2.0E-04	3.2E-05	--	0.1	1.00E-01	Practical Quantitation Limit (PQL)
Herbicides (µg/L)	94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	--	--	--	--	1.2E+04	--	--	--	--	1.2E+04	--	60	1.20E+04	NRWQC Human Health Consumption of Organisms CWA §304
	93-72-1	2-(2,4,5-Trichlorophenoxy)propionic acid (2,4,5-TP)	--	--	--	--	4.0E+02	--	--	--	--	4.0E+02	--	60	4.00E+02	NRWQC Human Health Consumption of Organisms CWA §304
Organotin (µg/L)	688-73-3	Tributyltin	--	--	--	--	--	4.2E-01	4.2E-01	7.4E-03	7.4E-03	7.4E-03	--	0.0052	7.40E-03	WA State WQCAquatic LifeMarine/Chronic173-201A WAC

Abbreviations and Notes:

CWA - Clean Water Act
ECY - Washington Department of Ecology
MEL - Ecology's Manchester Environmental Laboratory
pCULs - preliminary cleanup levels
PQL - practical quantitation limit
NRWQC - National Recommended Water Quality Criteria

ng/L - Nanogram per liter
µg/L - Microgram per liter
WAC - Washington Administrative Code
WQC - Water Quality Criteria
WTR - Washington Toxics Rule

- Based on Washington State Register 24-24-056 effective December 28, 2024.
- PQLs based on lowest available reporting limit from Friedman and Bruya Inc. in Seattle, WA.
- PQLs for Arsenic, Cadmium, Chromium (total and VI), copper, lead, mercury, nickel, and zinc are based on PQLs from Brooks Applied Laboratory in Seattle, WA for EPA Method 1638M to avoid elemental analysis interferences

**Table 6-2. Groundwater Contaminants of Interest
Jensen's Shipyard and Marina
Port of Friday Harbor**

Parameter Group ¹	Chemical Analyte	Preliminary PCUL	Maximum Detected Concentration	Site COI?
Metals, Dissolved (µg/L)	Arsenic	8.0	54	yes
	Cadmium	7.9	10	yes
	Chromium, total	0.6	2010	yes
	Copper	3.1	1,110	yes
	Lead	8.1	324	yes
	Mercury	0.03	3	yes
	Nickel	8.2	816.0	yes
	Zinc	81	728	yes
Petroleum Hydrocarbons (µg/L)	Gasoline range	1,700	290	no
	Diesel range	2,100	290	no
cPAHs (µg/L)	Benzo(a)pyrene	0.01	0.2	yes
	Benzo(a)anthracene	0.01	0.2	yes
	Benzo(b)fluoranthene	0.01	0.2	yes
	Benzo(k)fluoranthene	0.01	0.4	yes
	Chrysene	0.01	0.5	yes
	Dibenzo(a,h)anthracene	0.01	0.03	yes
	Indeno(1,2,3-cd)pyrene	0.01	0.14	yes
	Total cPAH TEQ	0.01	0.44	yes
PCB Aroclors (µg/L)	Total PCB Aroclors	0.1	<0.1	no
Organotins (µg/L)	Tributyltin	0.0074	0.2	yes
Dioxin/Furan Congeners (pg/L)	Total Dioxin/Furan TEQ	0.0159	361	yes

Notes:

1. Compounds that were not detected above practical quantitation limits are not listed including BTEX, other SVOCs, and other VOCs. Refer to Appendix A of the RIWP (Leon and CRETE 2022) for complete tabulation of these parameters.

ug/L - micrograms per liter

pg/L - picograms per liter

cPAH - carcinogenic polycyclic aromatic hydrocarbons

**Table 6-3. Summary of Indicator Hazardous Substances
Jensen's Shipyard and Marina
Port of Friday Harbor**

Parameter Group	Chemical Analyte	IHS?	Representative IHS	Most Restrictive PCUL Pathway	Notes
Metals	Arsenic	Yes	--	Marine	1
	Cadmium	No	Copper	Marine	2
	Chromium	No	Copper	Marine	2
	Copper	Yes	--	Marine	--
	Lead	Yes	--	TEE/HH	4
	Mercury	Yes	--	Marine	3
	Nickel	No	Copper, Zinc	Marine	--
	Zinc	Yes	--	Marine	5
PCB Aroclors	Total PCB Aroclors	Yes	--	Marine	--
Dioxin/Furan Congeners	Total Dioxin/Furan TEQ	Yes	--	Marine	--
TPH	Diesel Range	No	Total TPH-Dx	TEE/HH	6
	Oil Range	No	Total TPH-Dx	TEE/HH	6
	Total Diesel and Oil Range	Yes	--	TEE/HH	6
cPAHs	Benzo(a)pyrene	No	Total cPAH TEQ	Marine	7
	Total cPAH TEQ	Yes	--	Marine	7
Organotins	TBT	Yes	--	Marine	--
Pesticides	DDD	No	DDT	Marine	8
	DDE		--	Marine	--
	DDT	Yes	--	Marine	8
	Total DDT/DDD/DDE	No	--	Marine	--

Notes:

1. Arsenic exceedances co-located with copper exceedances except two samples (SRWA-4-3.5' and MW-4-11'). Therefore arsenic is an IHS only at locations SRWA-4 and MW-4.
2. Copper always present at concentrations above PCUL when the PCUL for the contaminant was exceeded.
3. Mercury exceedances co-located with copper exceedances except one sample (SRWA-13-3-5'). Therefore mercury is an IHS only at location SRWA-13.
4. Lead exceedances co-located with copper exceedances. However, lead cleanup driven by TEE and HH whereas copper cleanup driven by marine pathway.
5. Zinc exceedances co-located with copper exceedances except for three samples (FDA-3-2.5', TP-5, and TP-6). Therefore zinc is an IHS only at locations FDA-3, TP-5, and TP-6.
6. Cleanup of Total TPH-Dx will result in compliance for both diesel and heavy oil ranges.
7. Cleanup of total CPAHs will result in compliance for Benzo(a) pyrene.
8. DDT always present at concentrations above PCUL when DDD PCUL exceeded.

**Table 7-1. Copper and Zinc Distribution in BLWA Shoreline Soil and Groundwater
Jensen's Shipyard and Marina
Port of Friday Harbor**

	Copper (Soil PCUL=36.4 mg/kg; GW PCUL=3.1 ug/L)							Zinc (Soil PCUL=100 mg/kg; GW PCUL=81 ug/L)					
	BLWA-4/MW-7		BLWA-6/MW-8		BLWA-8/MW-9			BLWA-4/MW-7		BLWA-6/MW-8		BLWA-8/MW-9	
Depth (ft bgs)	Soil ¹	GW ²	Soil ¹	GW ²	Soil ¹	GW ²		Soil ¹	GW ²	Soil ¹	GW ²	Soil ¹	GW ²
0.0-0.5	680		9300		1100			260		1400		350	
0.5-1.0					173							83.4	
1.0-1.5			3500		170	15.9			3800		110	135	
1.5-2.0													
2.0-2.5	15.9	9.54		45.6			18	466		227			
2.5-3.0													
3.0-3.5					24.1								
3.5-4.0	18.5						54.1				32.4		
4.0-4.5			58.3						156				
4.5-5.0	86		84				110		72				
5.0-5.5													
5.5-6.0			43.6				80.7				31.6		67.4
6.0-6.5													
6.5-7.0													
7.0-7.5		9.54		45.6		15.9		466		227		135	
7.5-8.0													
8.0-8.5													
8.5-9.0													
9.0-9.5													
9.5-10.0			20						47				
10.0-10.5													
10.5-11.0	39.3								61.9				
11.0-11.5													
11.5-12.0													
12.0-12.5													

Groundwater
Elevation
Range
During
Tidal
Study

Notes:

ft bgs = feet below ground surface

GW = groundwater

1. Soil concentrations shown in mg/kg. Some depths of samples adjusted to account for overlapping data.

2. Groundwater concentrations in ug/L with shading shown through the entire well screen interval.

Soil PCUL is based on vadose zone soil protective of groundwater to surface water PCUL.

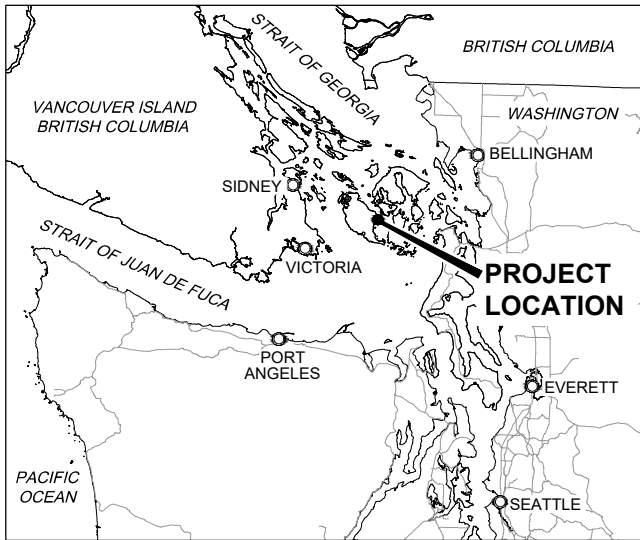
Groundwater PCUL is based on protection of surface water.

Highlighted colors selected based on the the following ranges of concentrations relative to the PCUL:

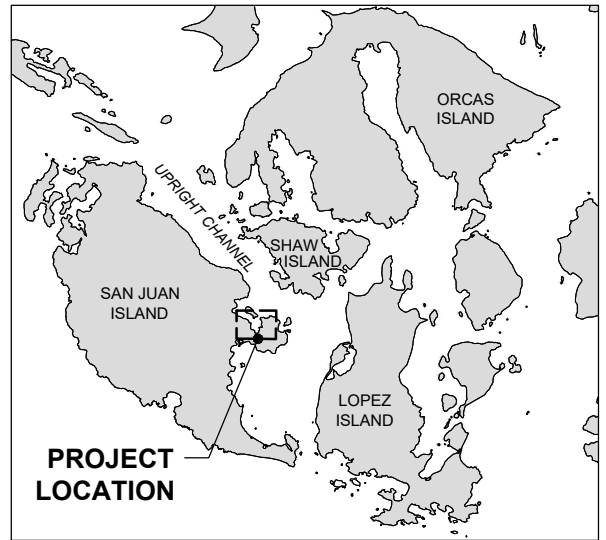
	>10x PCUL
	>3x to <10x PCUL
	>2x to <3x PCUL
	<2x PCUL

Figures

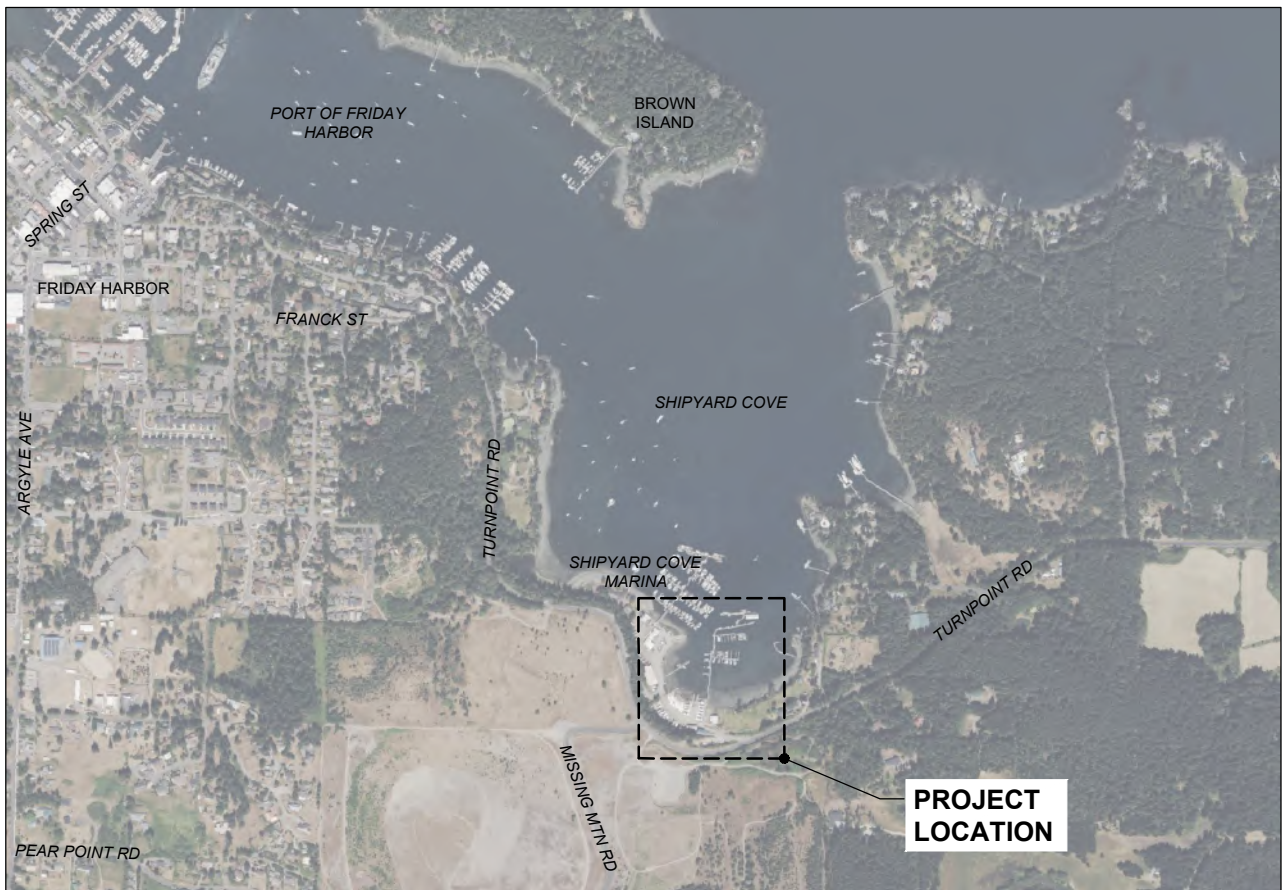
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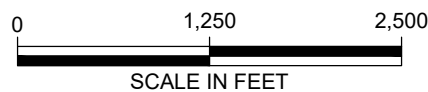
VICINITY MAP



VICINITY MAP - SAN JUAN ISLANDS



LOCATION MAP





LOCATION MAP



LEGEND

— OHW —

Existing OHW

— MHHW —

Existing MHHW

- - - - -

Existing HTL (Approx.)

— — — — —

Site Boundary (Approx.)

•

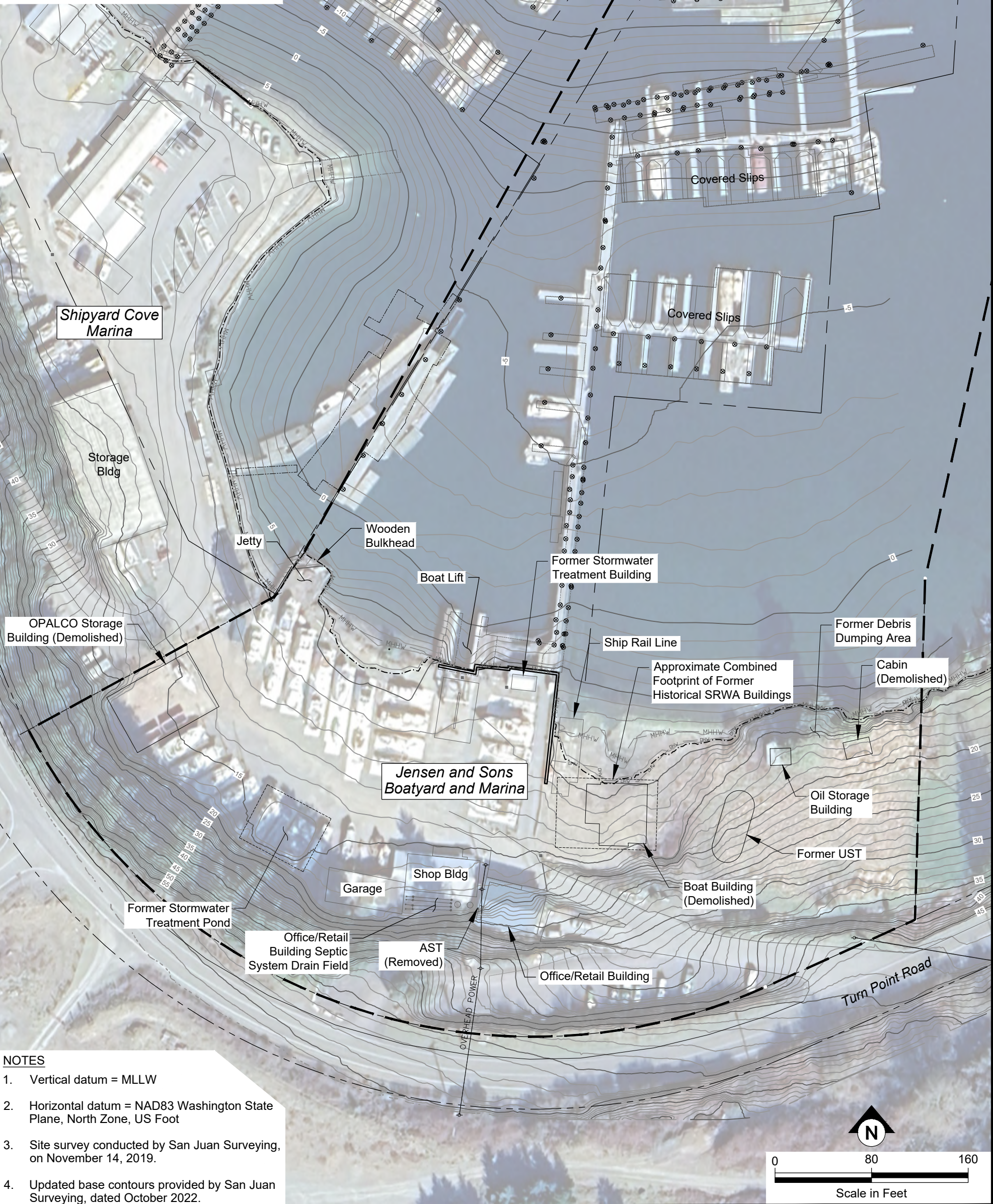
Existing Piling

—10—

Existing Contour (1-Ft Interval)

- - - - -

Property Line

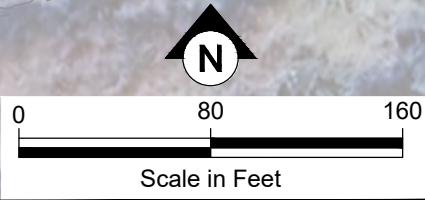


- NOTES
1. Vertical datum = MLLW

2. Horizontal datum = NAD83 Washington State Plane, North Zone, US Foot

3. Site survey conducted by San Juan Surveying, on November 14, 2019.

4. Updated base contours provided by San Juan Surveying, dated October 2022.



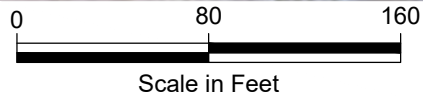
LEGEND

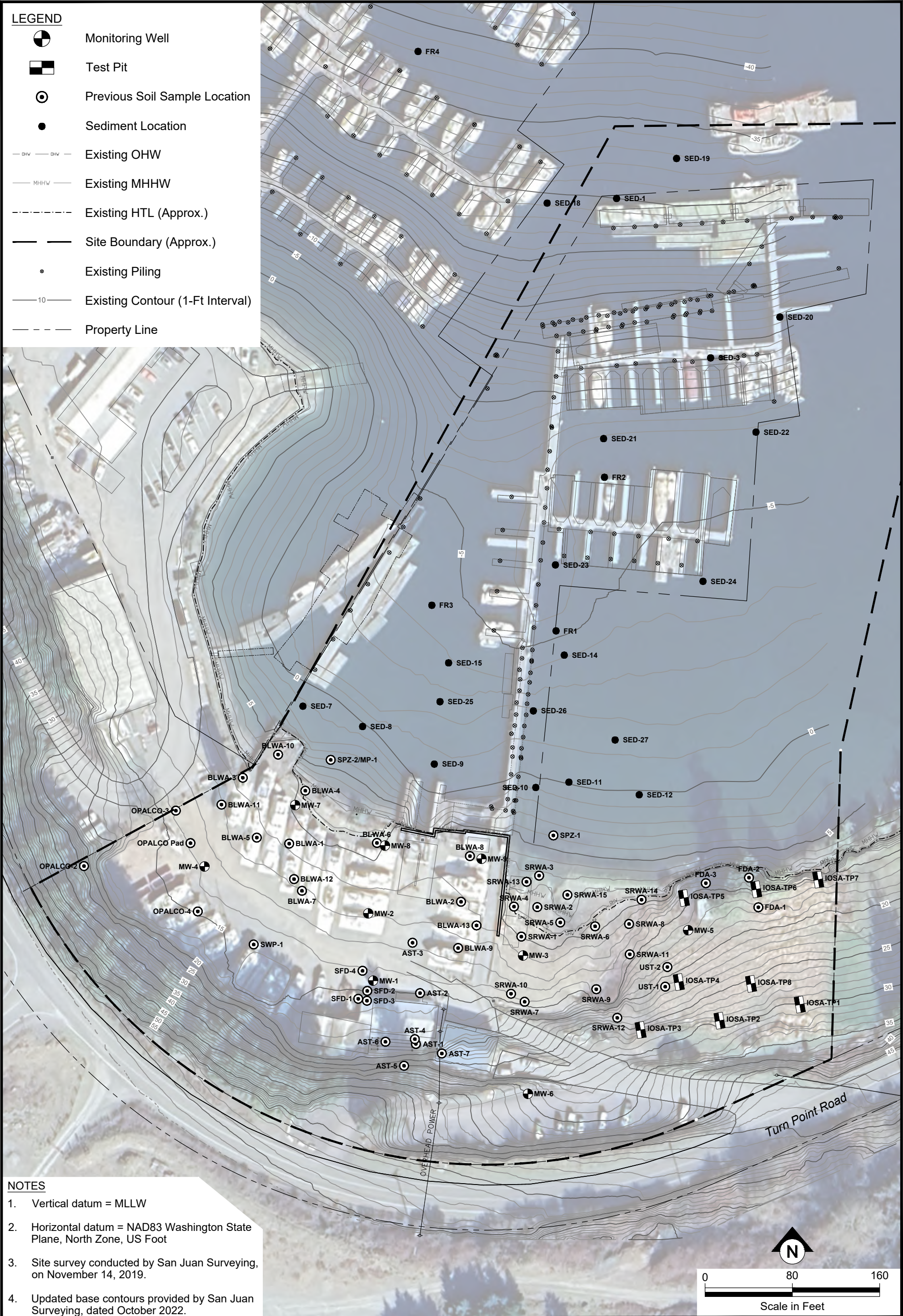
- OHW — Existing OHW
- MHHW — Existing MHHW
- - - - - Existing HTL (Approx.)
- — — Site Boundary (Approx.)
- Existing Piling
- 10— Existing Contour (1-Ft Interval)
- - - - - Property Line



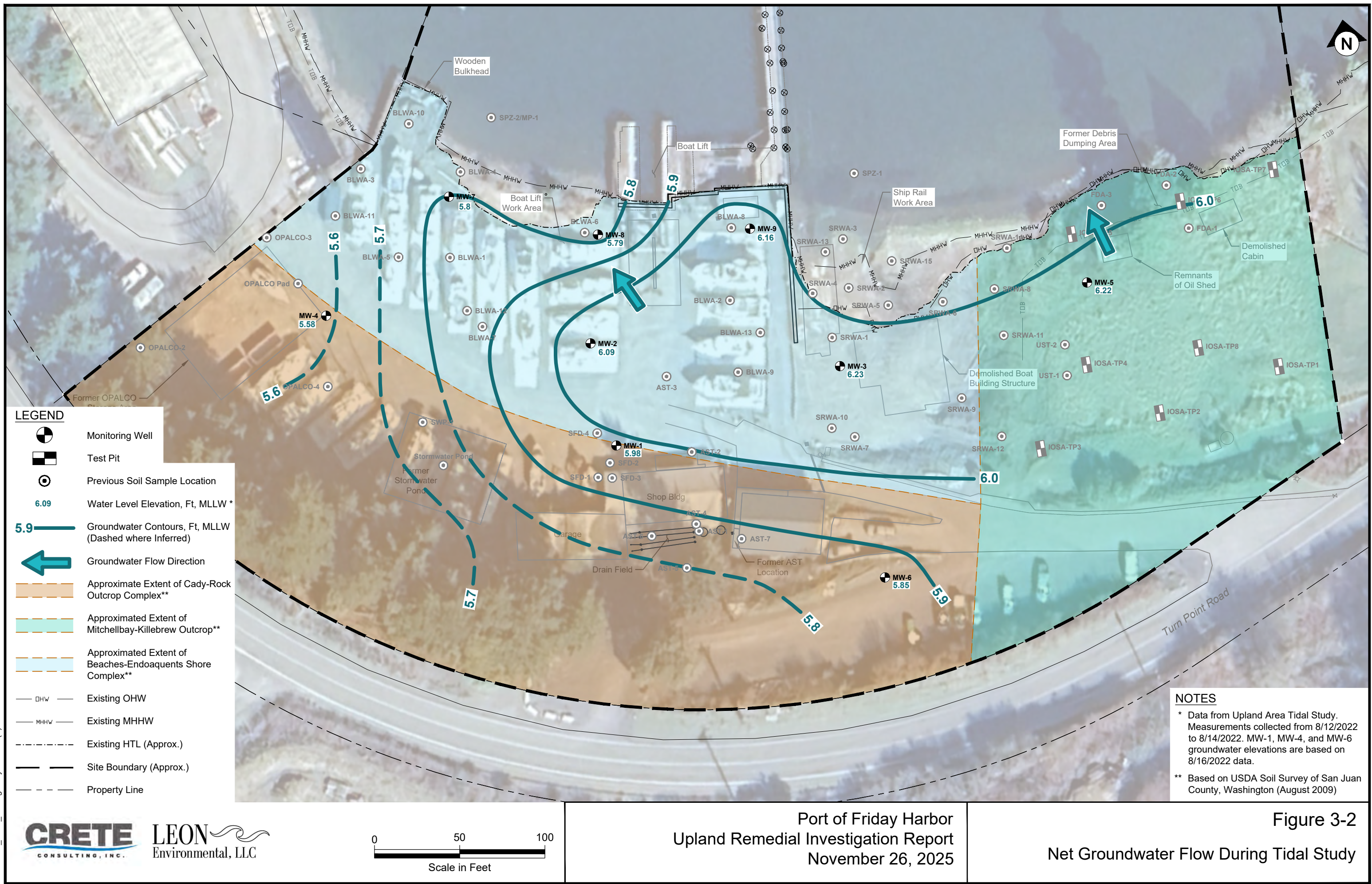
NOTES

- Vertical datum = MLLW
- Horizontal datum = NAD83 Washington State Plane, North Zone, US Foot
- Site survey conducted by San Juan Surveying, on November 14, 2019.
- Updated base contours provided by San Juan Surveying, dated October 2022.

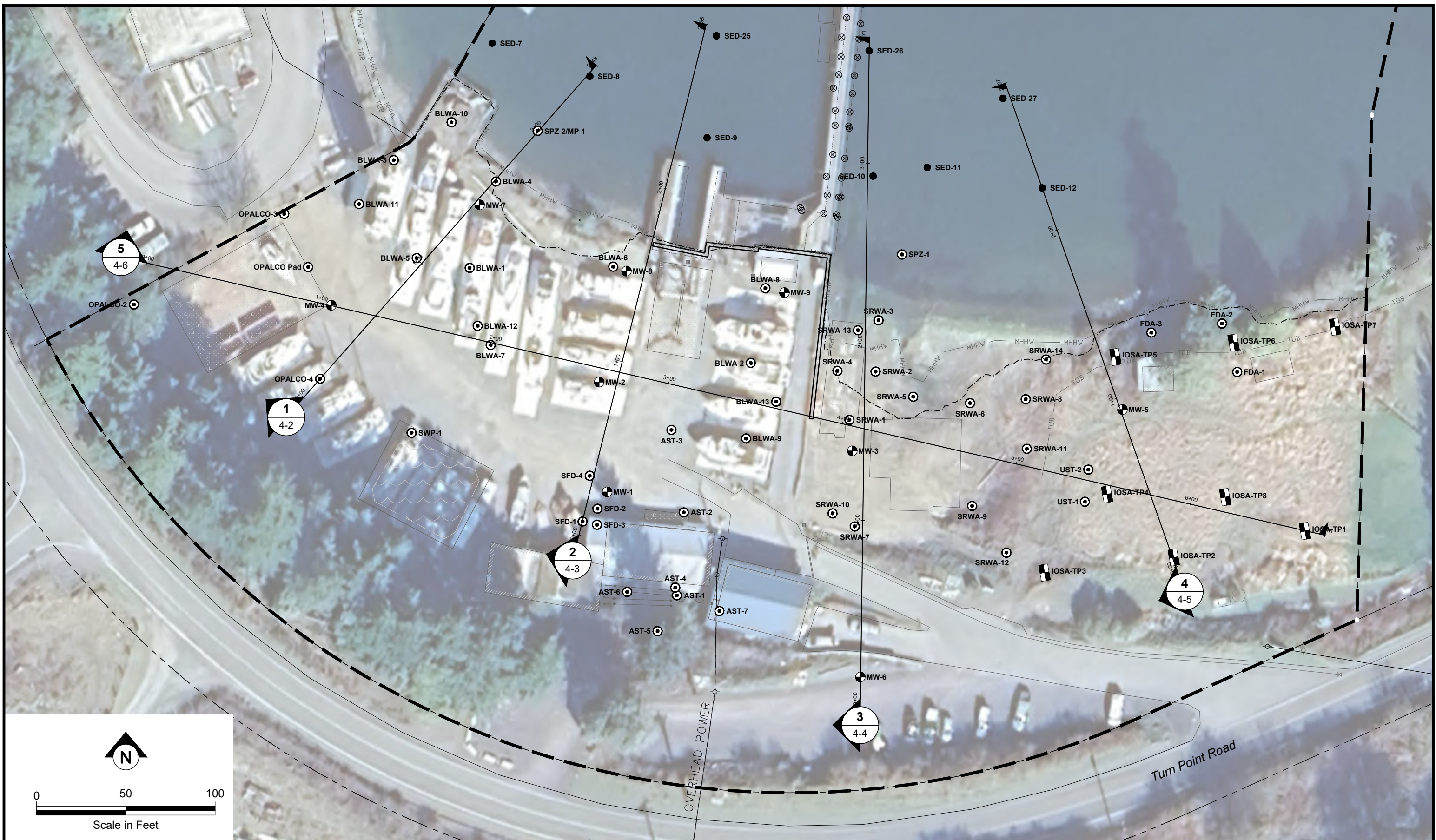




File: PoFH_2025_R1.dwg Layout: GW (2)



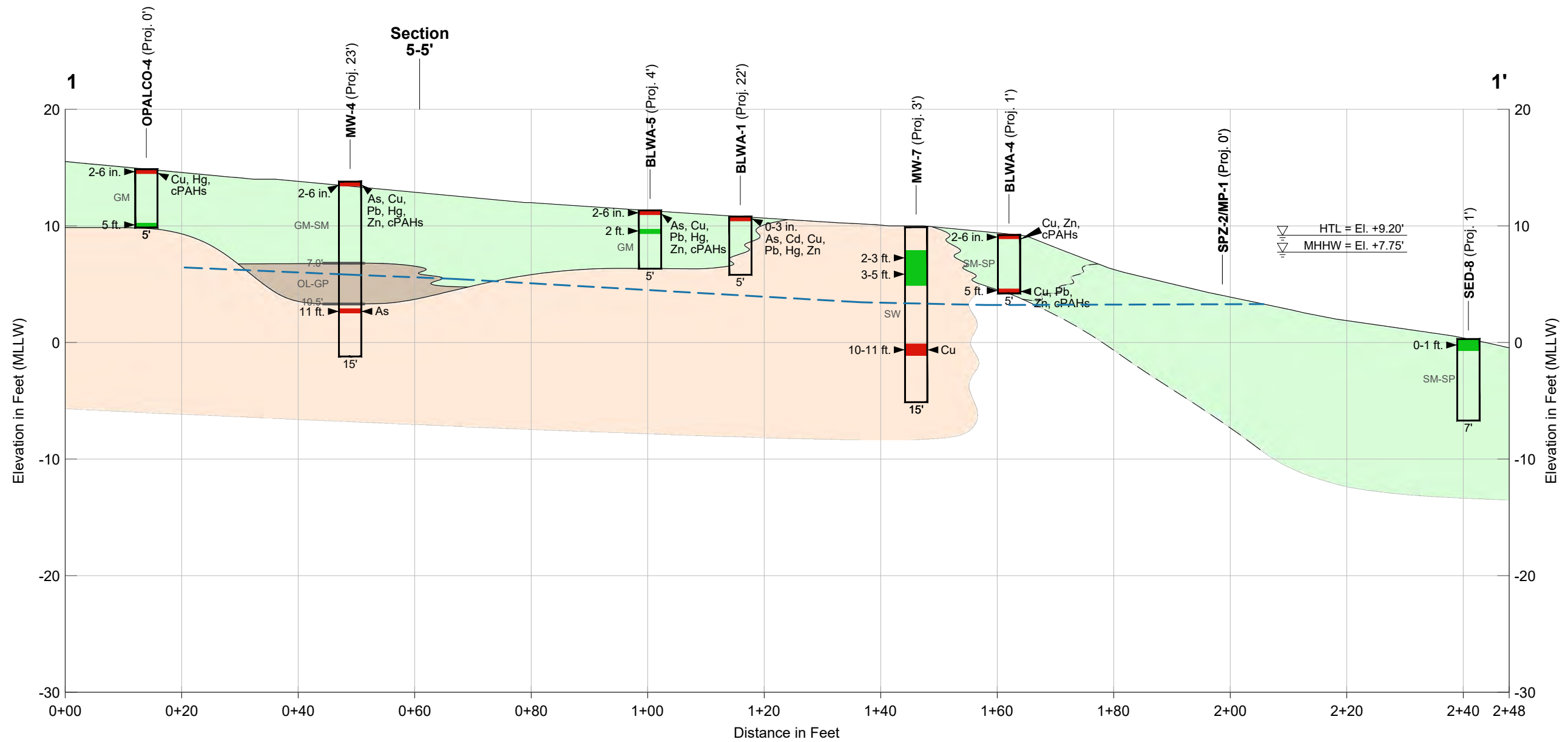
File: PoFH_2025-Sections.dwg Layout: Concept



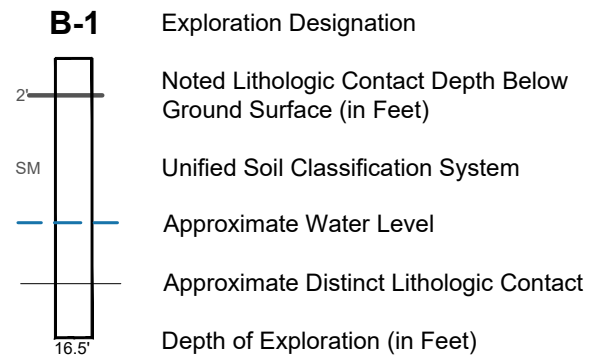
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Upland Remedial Investigation Report
September 26, 2025

Figure 4-1
Geologic Cross Sections - Plan

File: PoFH_2025-Sections.dwg Layout: Sections (1)



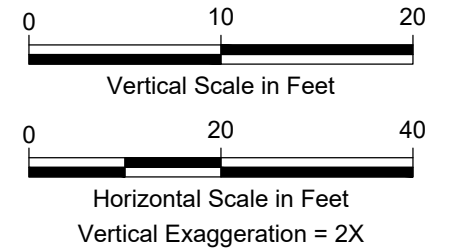
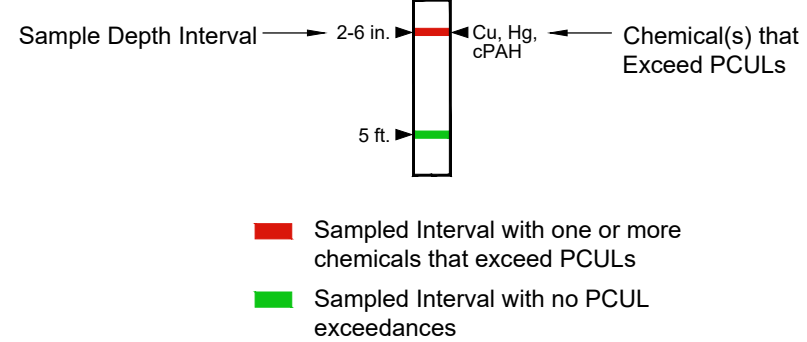
LEGEND



SOIL DESCRIPTIONS

SP, SW	sand or sand-gravel mixtures, poorly-graded or well-graded
SM	silty sand, sand and silt mixtures
CL	clay, low to moderate plasticity
ML	silt, sometimes with sand/clay/gravel
GW, GP, GM	gravel or sandy gravel mixtures, gravel or silt-sand-gravel mixture

ANALYTICAL RESULTS

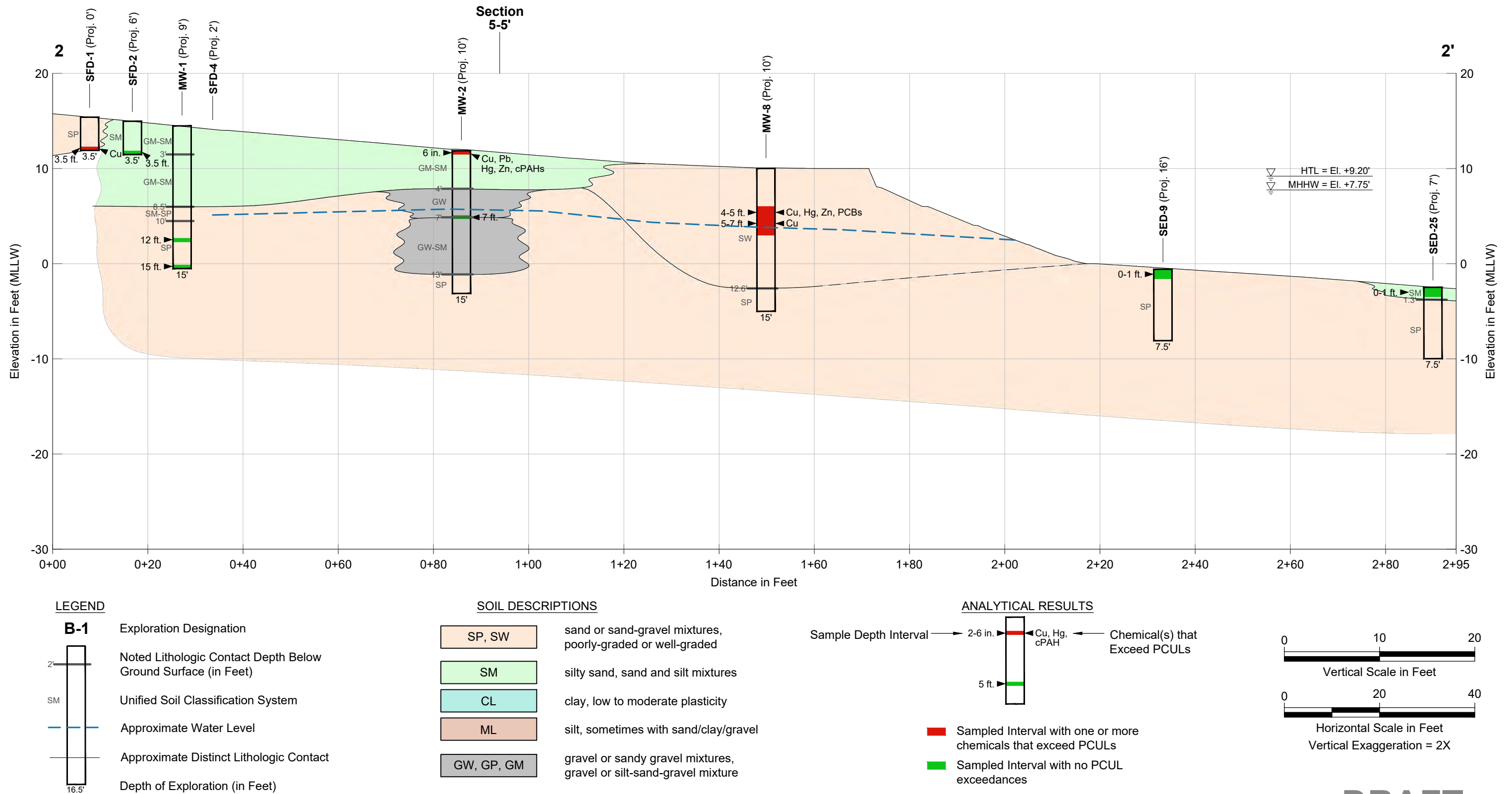


DRAFT

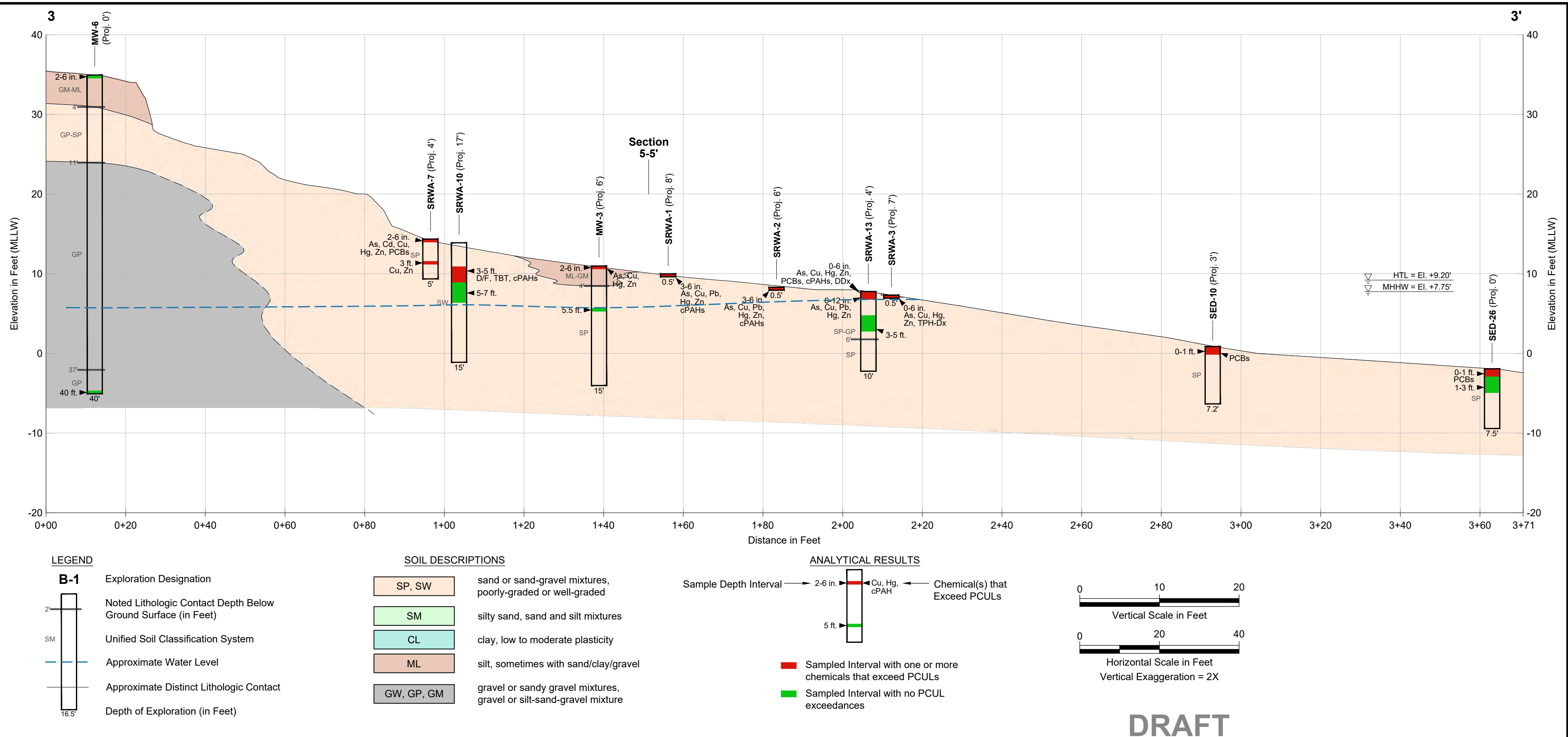
NOTE

For illustration on these cross-sections, results for saturated zone soils have been compared to most stringent PCULs for soil which include criteria for protection of surface water via leaching from vadose zone to groundwater.

File: PoFH_2025-Sections.dwg Layout: Sections (2)



File: PoFH_2025-Sections.dwg Layout: Sections (3)



NOTE

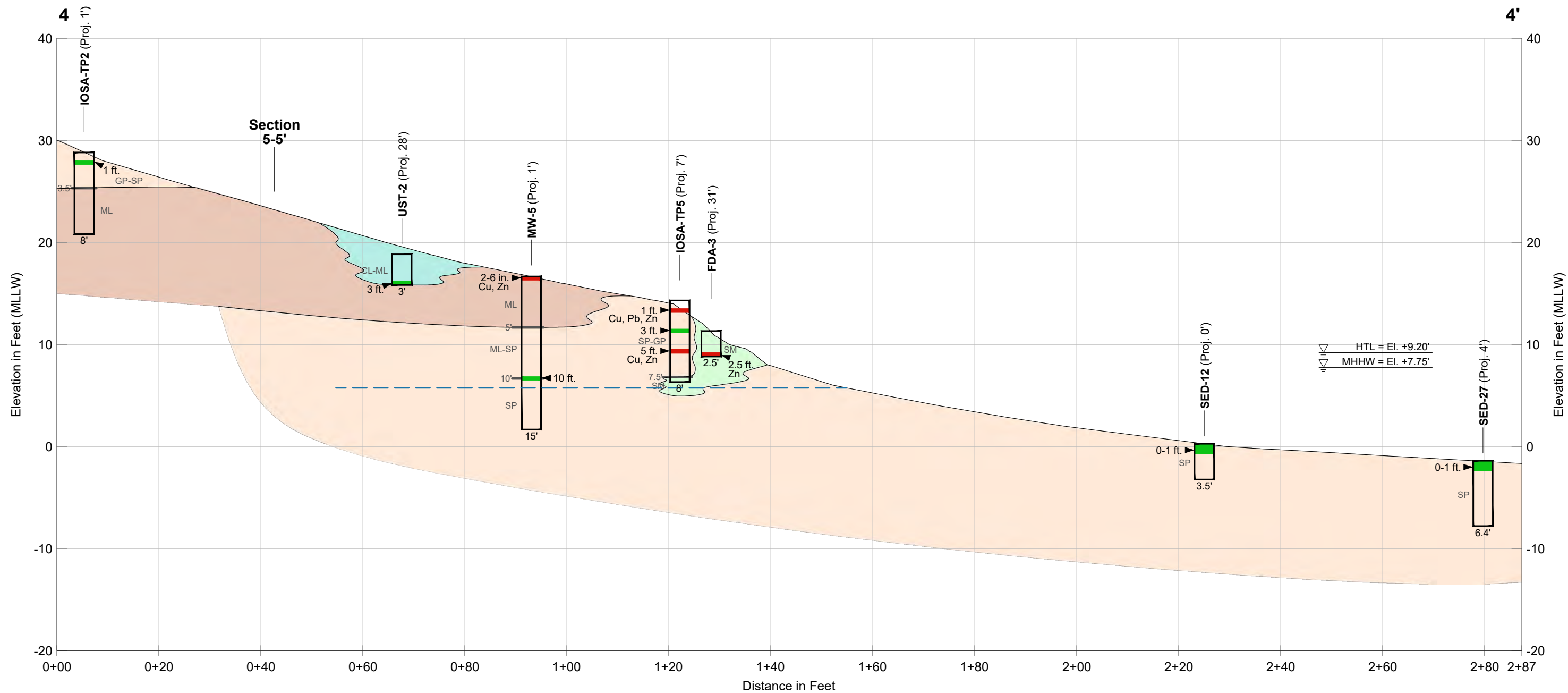
For illustration on these cross-sections, results for saturated zone soils have been compared to most stringent PCULs for soil which include criteria for protection of surface water via leaching from vadose zone to groundwater.



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September 26, 2025

Figure 4-4
Geologic Cross Section 3-3'

File: PoFH_2025-Sections.dwg Layout: Sections (4)



LEGEND

- B-1** Exploration Designation
- Noted Lithologic Contact Depth Below Ground Surface (in Feet)
- Unified Soil Classification System
- Approximate Water Level
- Approximate Distinct Lithologic Contact
- Depth of Exploration (in Feet)

SOIL DESCRIPTIONS

- SP, SW** sand or sand-gravel mixtures, poorly-graded or well-graded
- SM** silty sand, sand and silt mixtures
- CL** clay, low to moderate plasticity
- ML** silt, sometimes with sand/clay/gravel
- GW, GP, GM** gravel or sandy gravel mixtures, gravel or silt-sand-gravel mixture

ANALYTICAL RESULTS

- Sample Depth Interval → 2-6 in. → Cu, Hg, cPAH → Chemical(s) that Exceed PCULs
- 5 ft. →
- Sampled Interval with one or more chemicals that exceed PCULs
- Sampled Interval with no PCUL exceedances

0 10 20
Vertical Scale in Feet

0 20 40
Horizontal Scale in Feet

Vertical Exaggeration = 2X

DRAFT

CRETE
CONSULTING, INC.

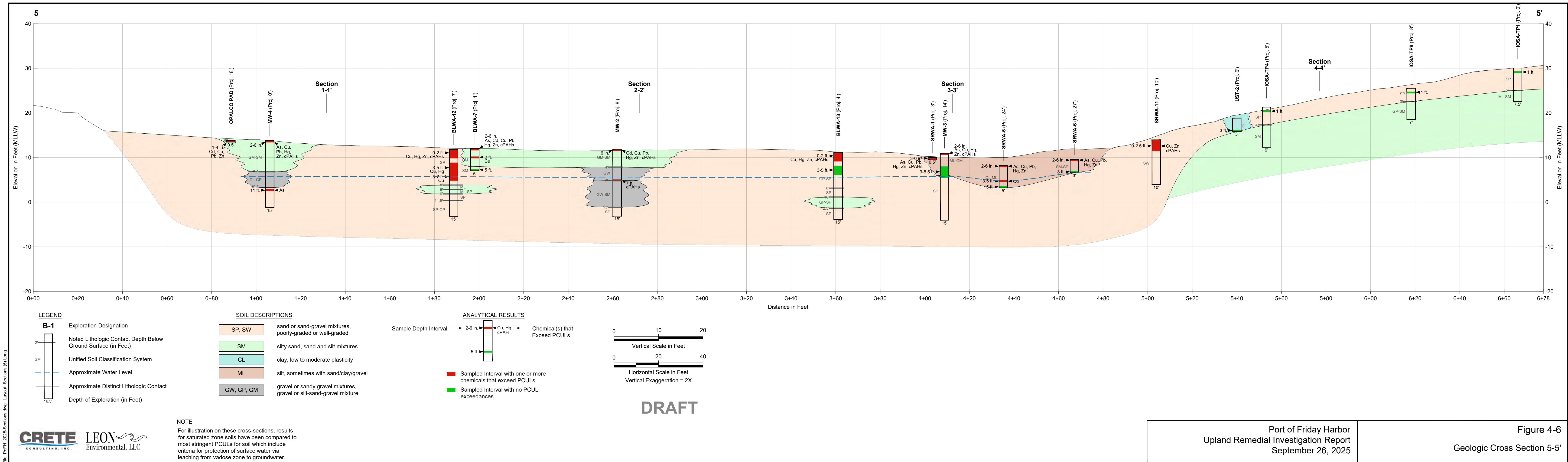
LEON
Environmental, LLC

NOTE

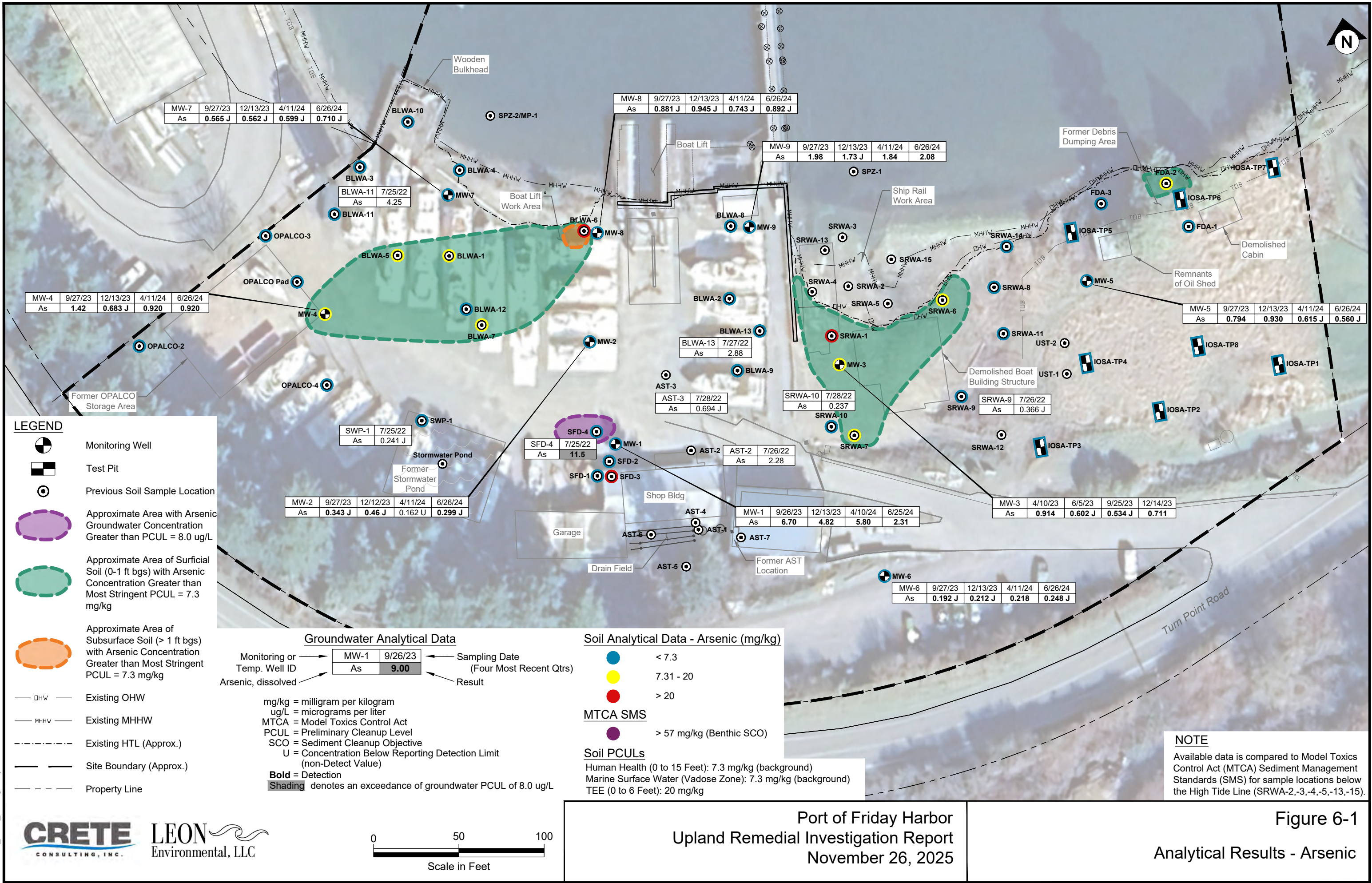
For illustration on these cross-sections, results for saturated zone soils have been compared to most stringent PCULs for soil which include criteria for protection of surface water via leaching from vadose zone to groundwater.

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November 26, 2025

Figure 4-5
Geologic Cross Section 4-4'



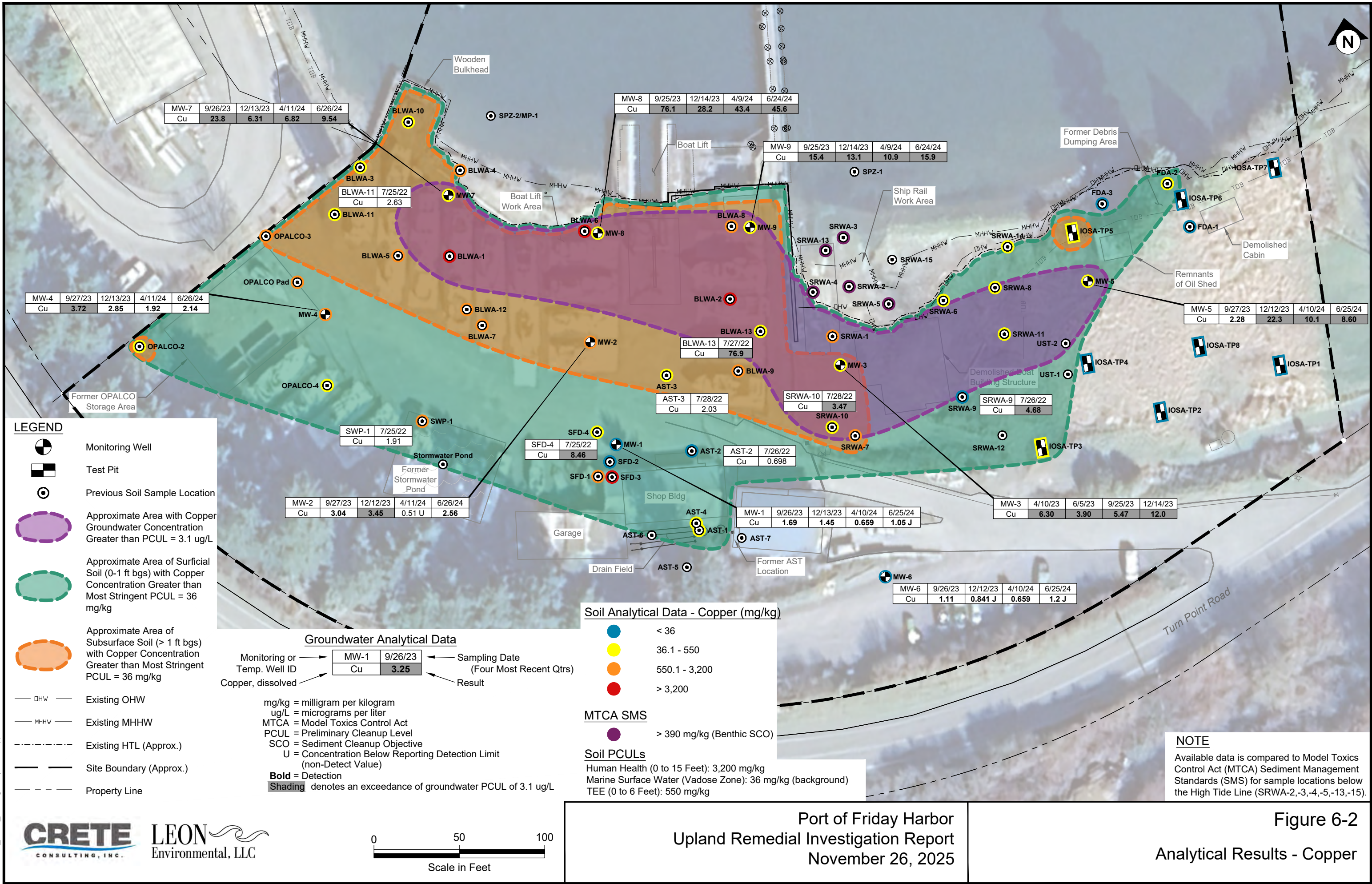
File: PoFH_2026_R1.dwg Layout: Ar



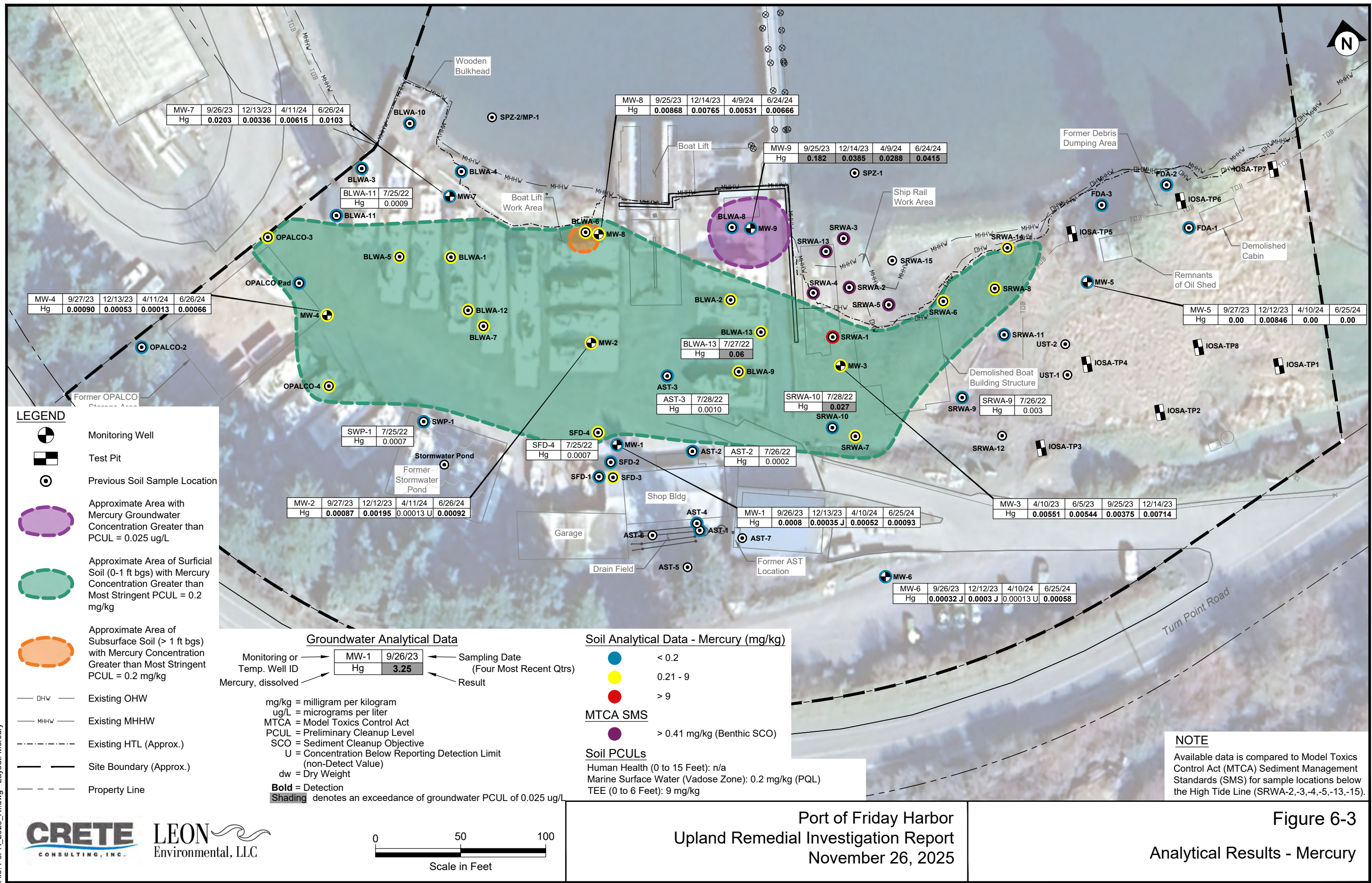
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November 26, 2025

Figure 6-1
Analytical Results - Arsenic

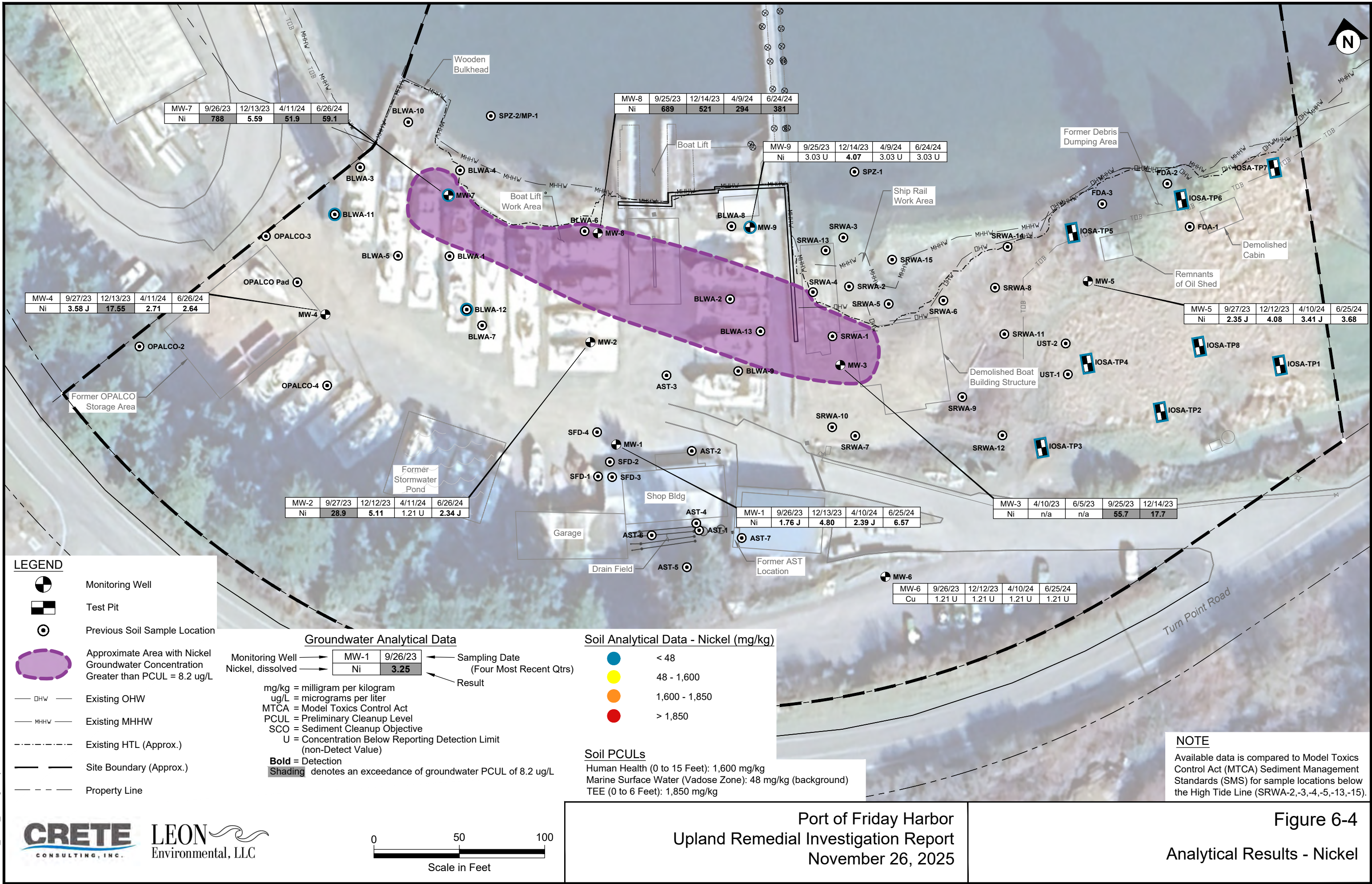
File: PoFH_2026_RI.dwg Layout: Copper

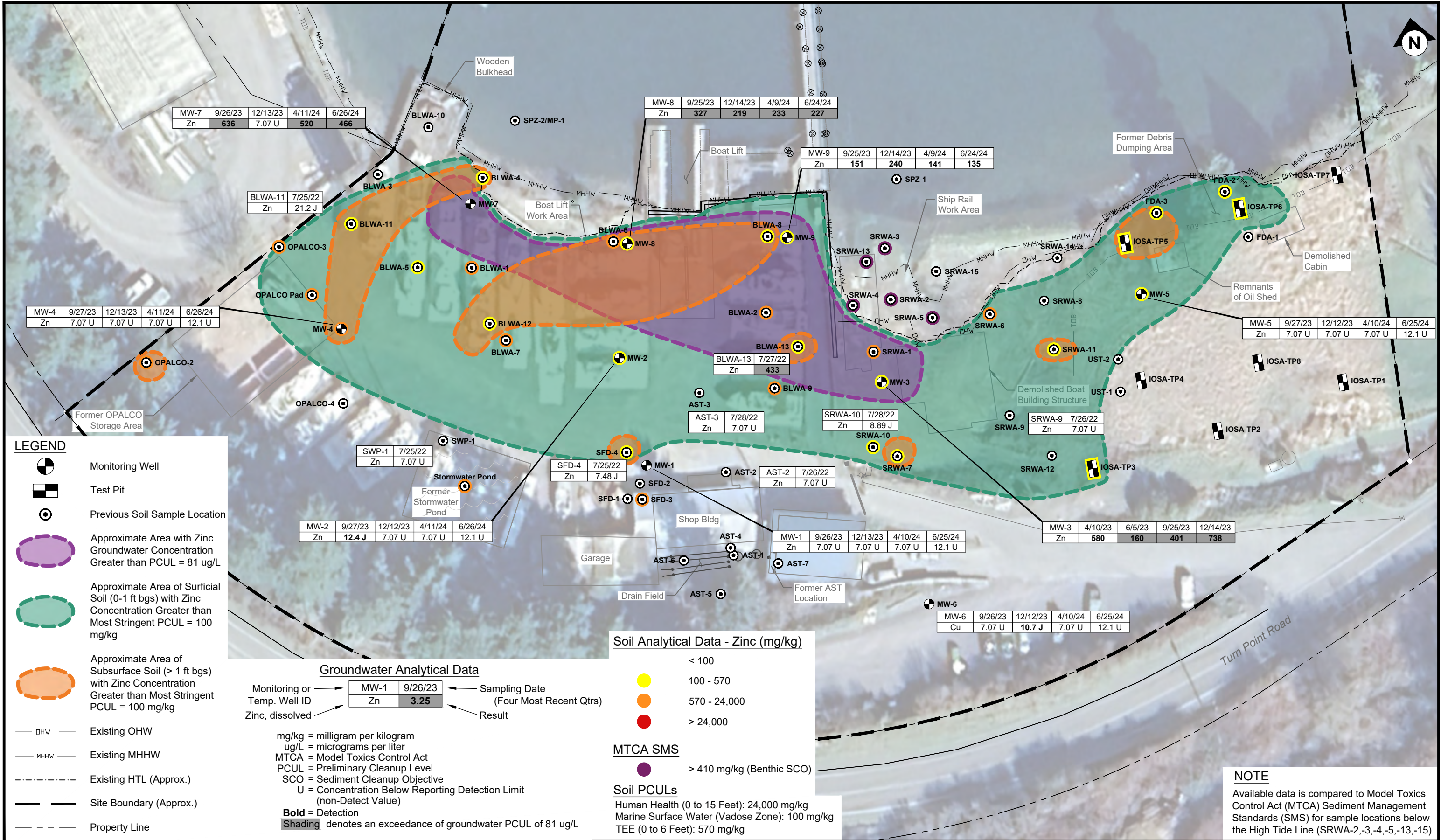


File: PoFH_2026_R1.dwg Layout: Mercury



File: PoFH_2026_R1.dwg Layout: Nickel

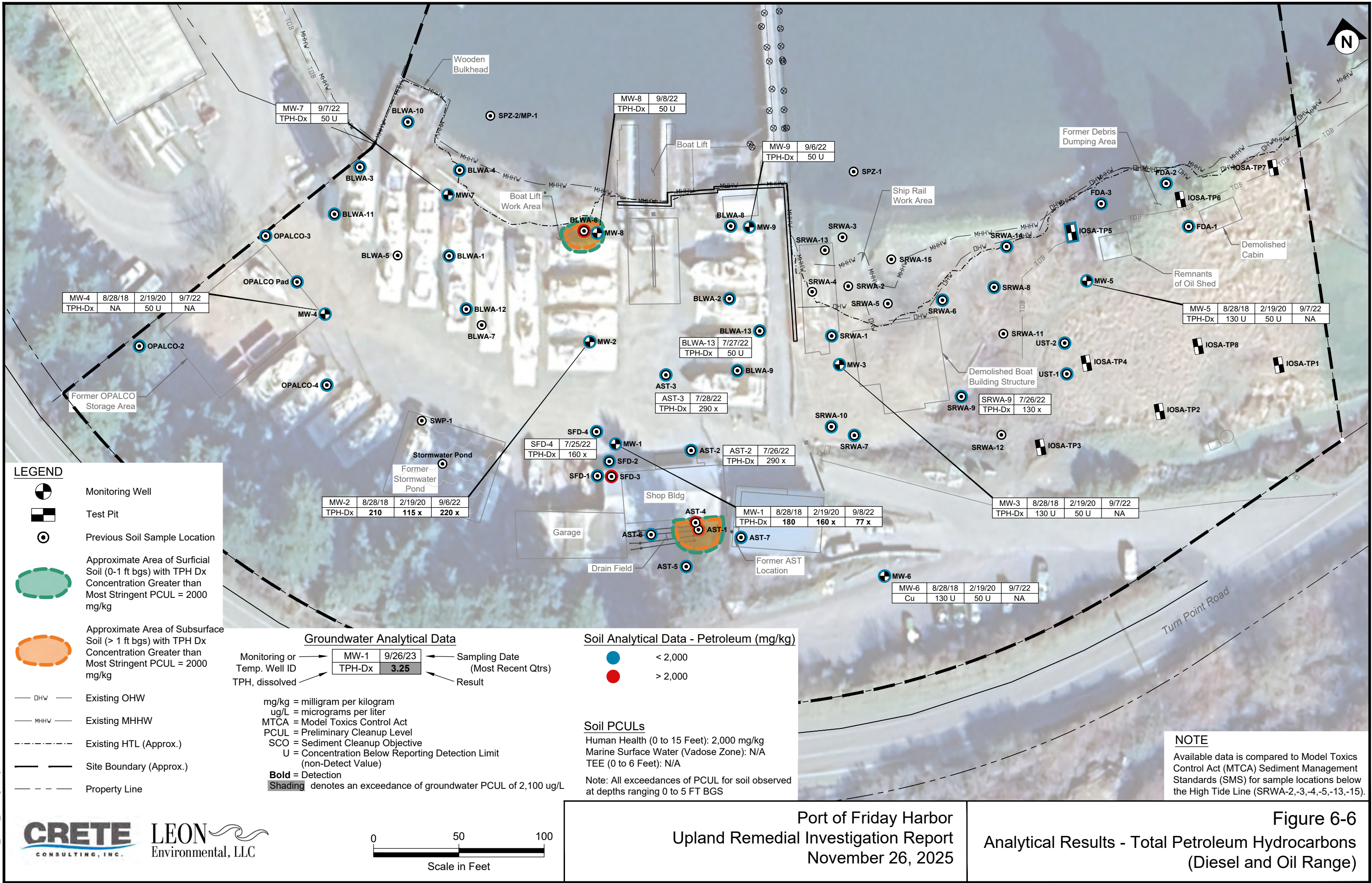




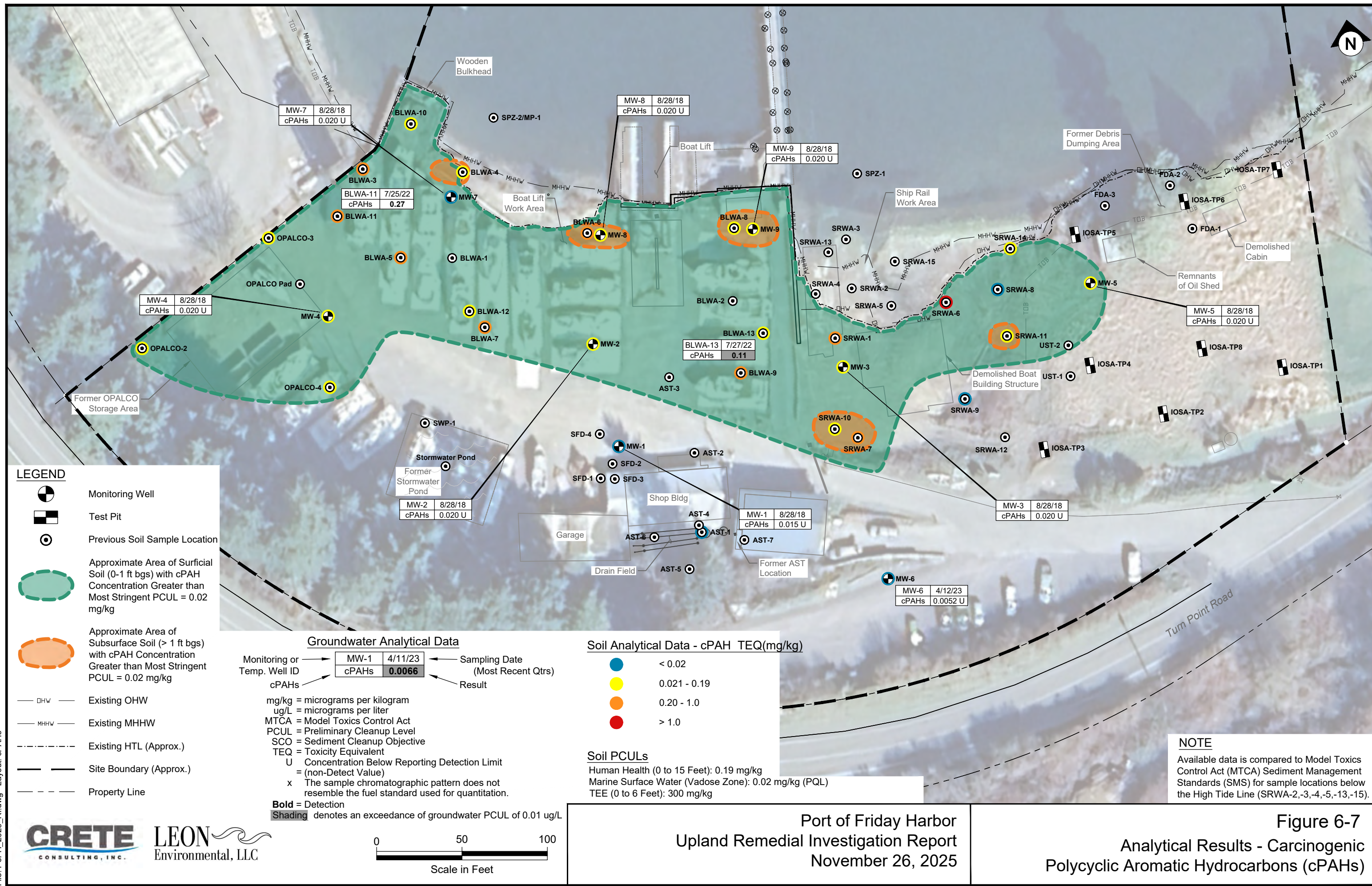
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November 26, 2025

Figure 6-5
Analytical Results - Zinc

File: PoFH_2026_R1.dwg Layout: TPH

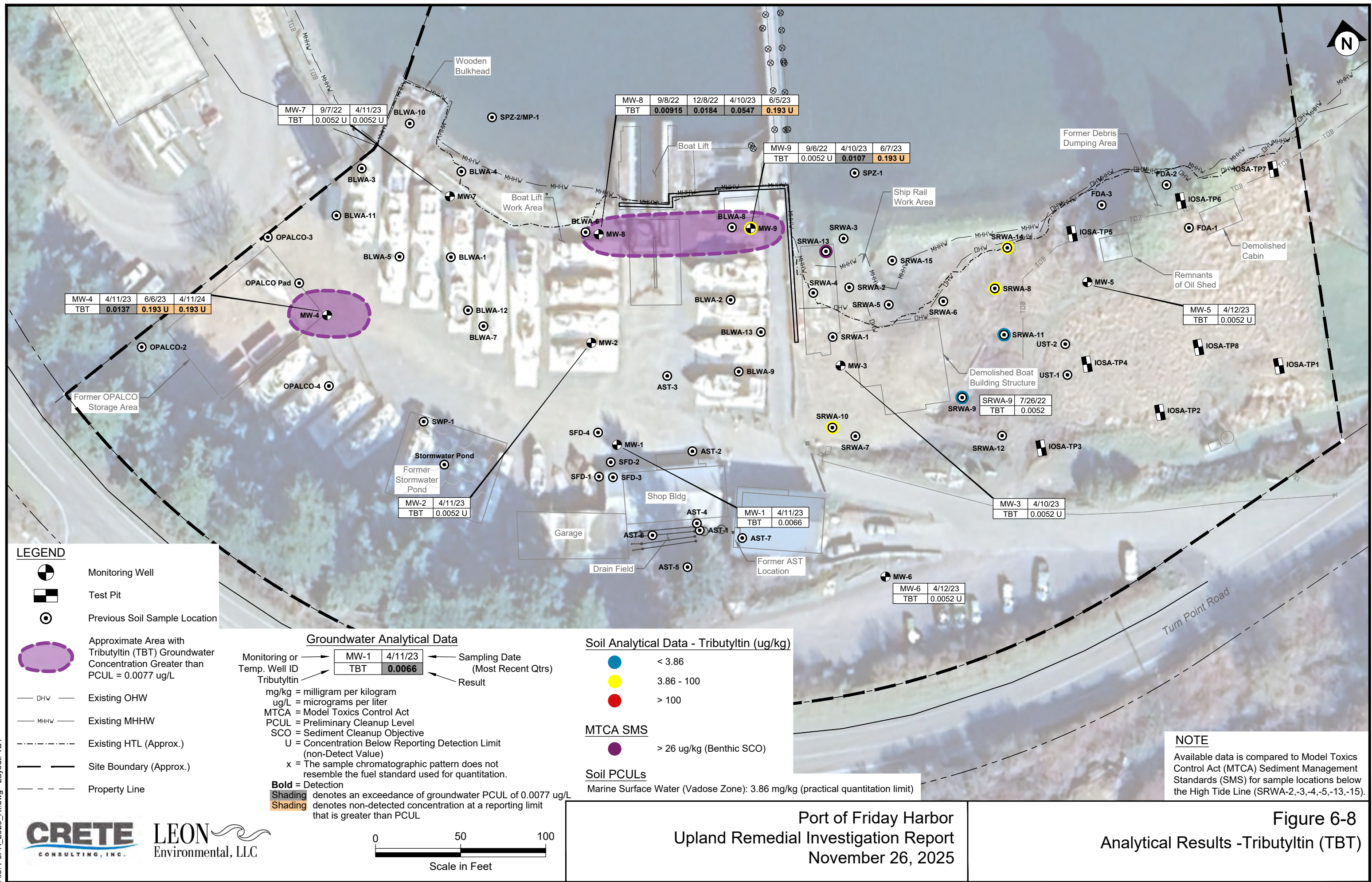


File: PoFH_2026_RI.dwg Layout: cPAHs

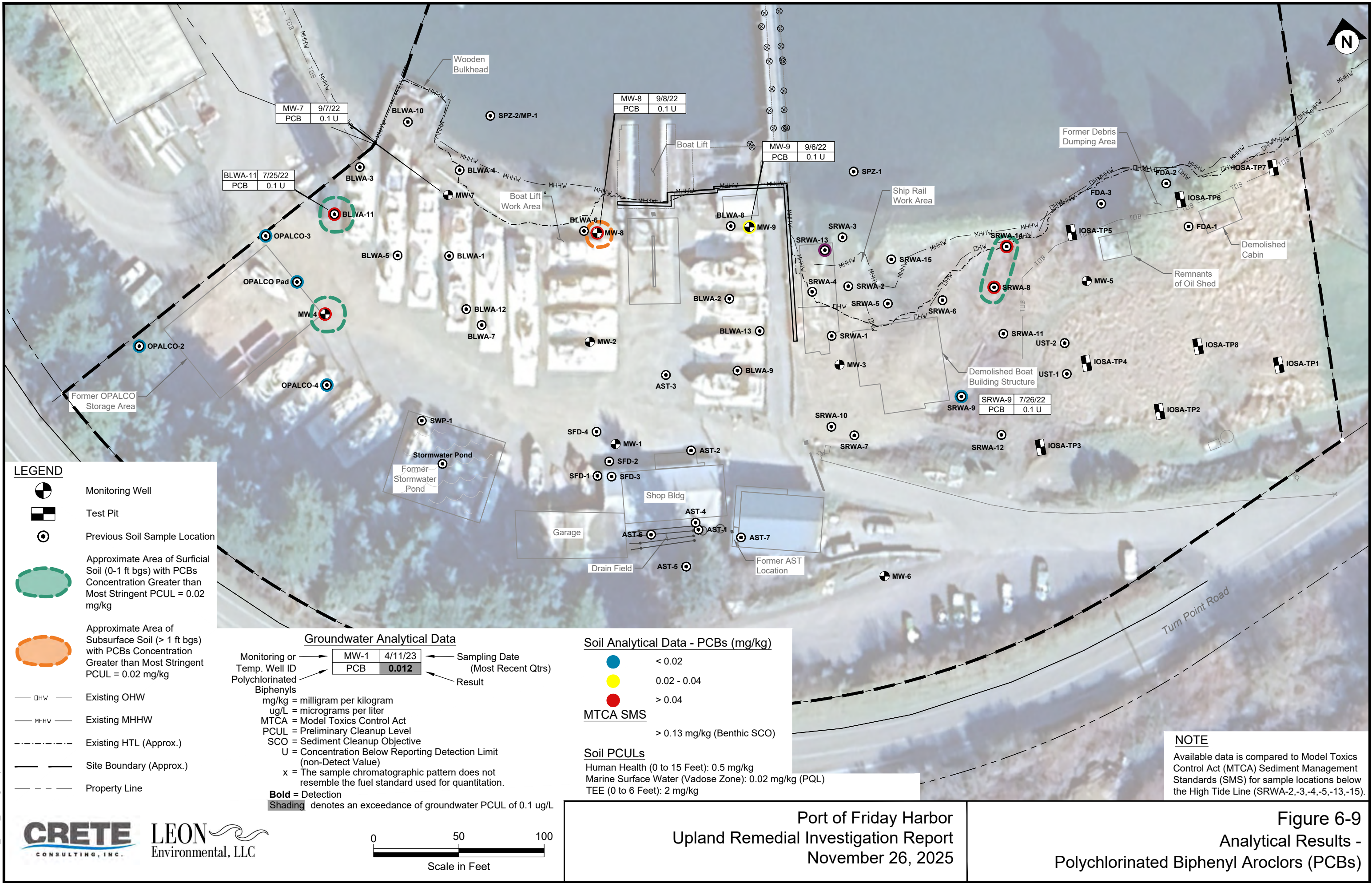


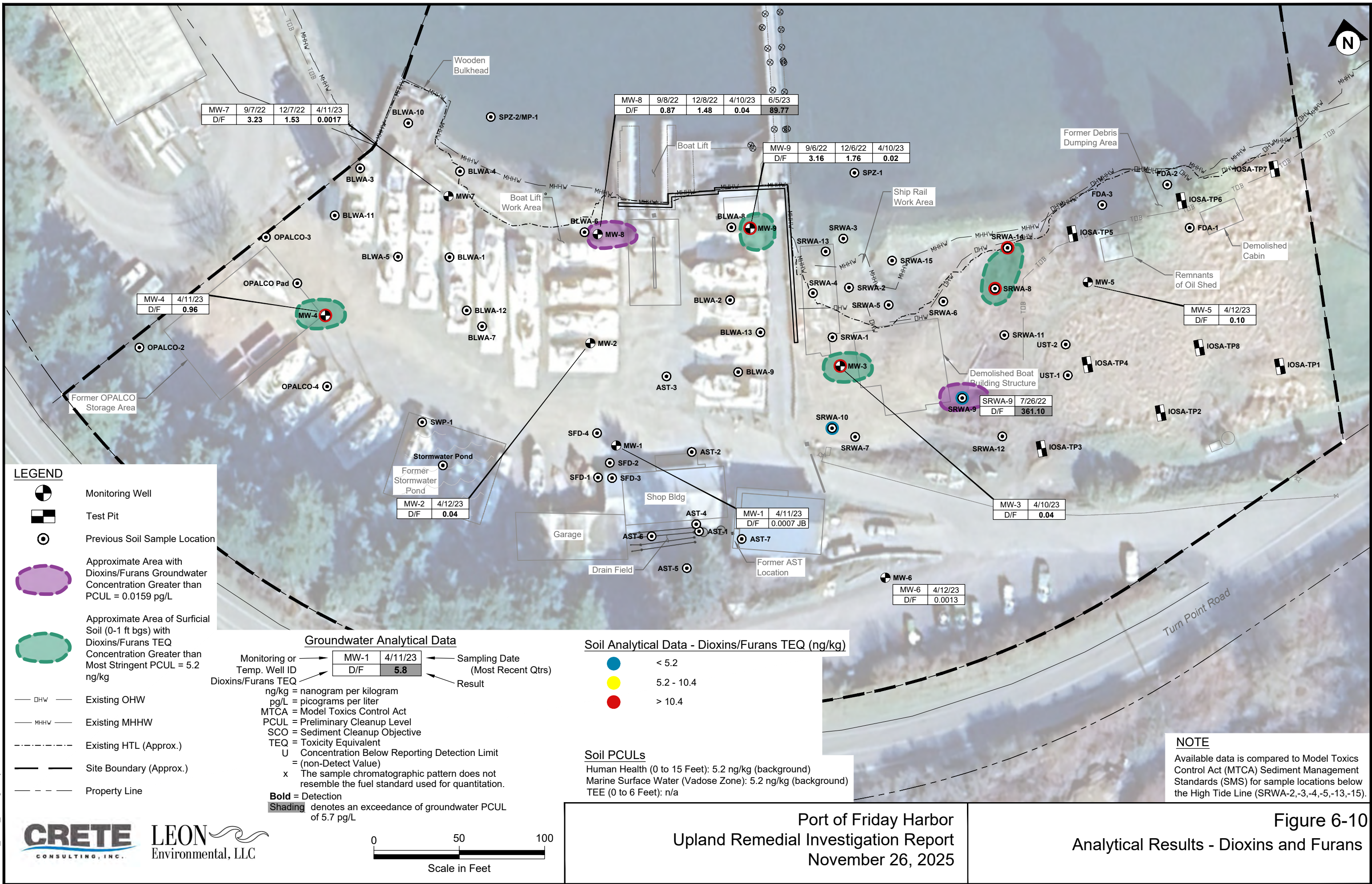
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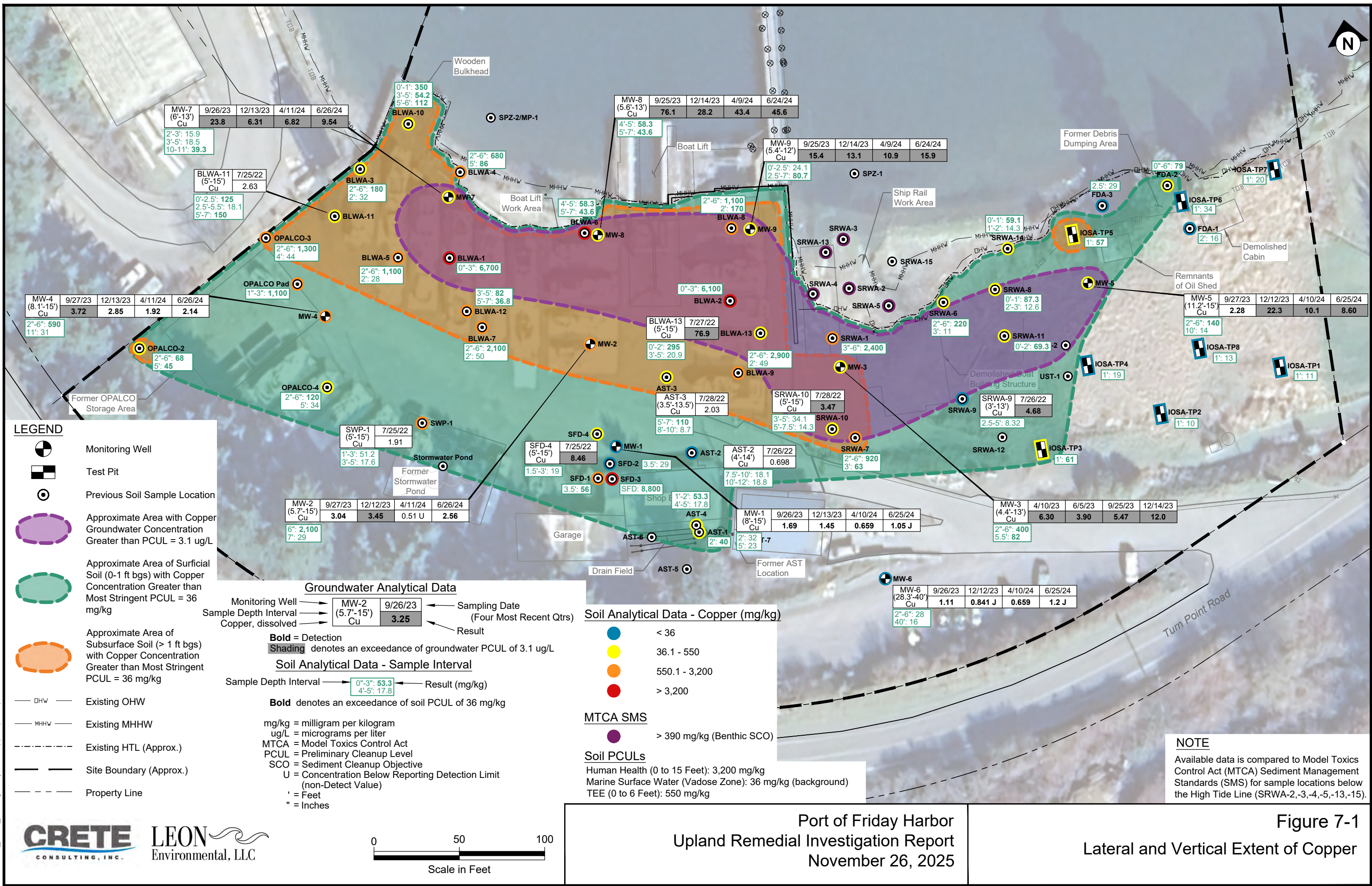
Figure 6-7
Analytical Results - Carcinogenic
Polycyclic Aromatic Hydrocarbons (cPAHs)



File: PoFH_2026_R1.dwg Layout: PCB

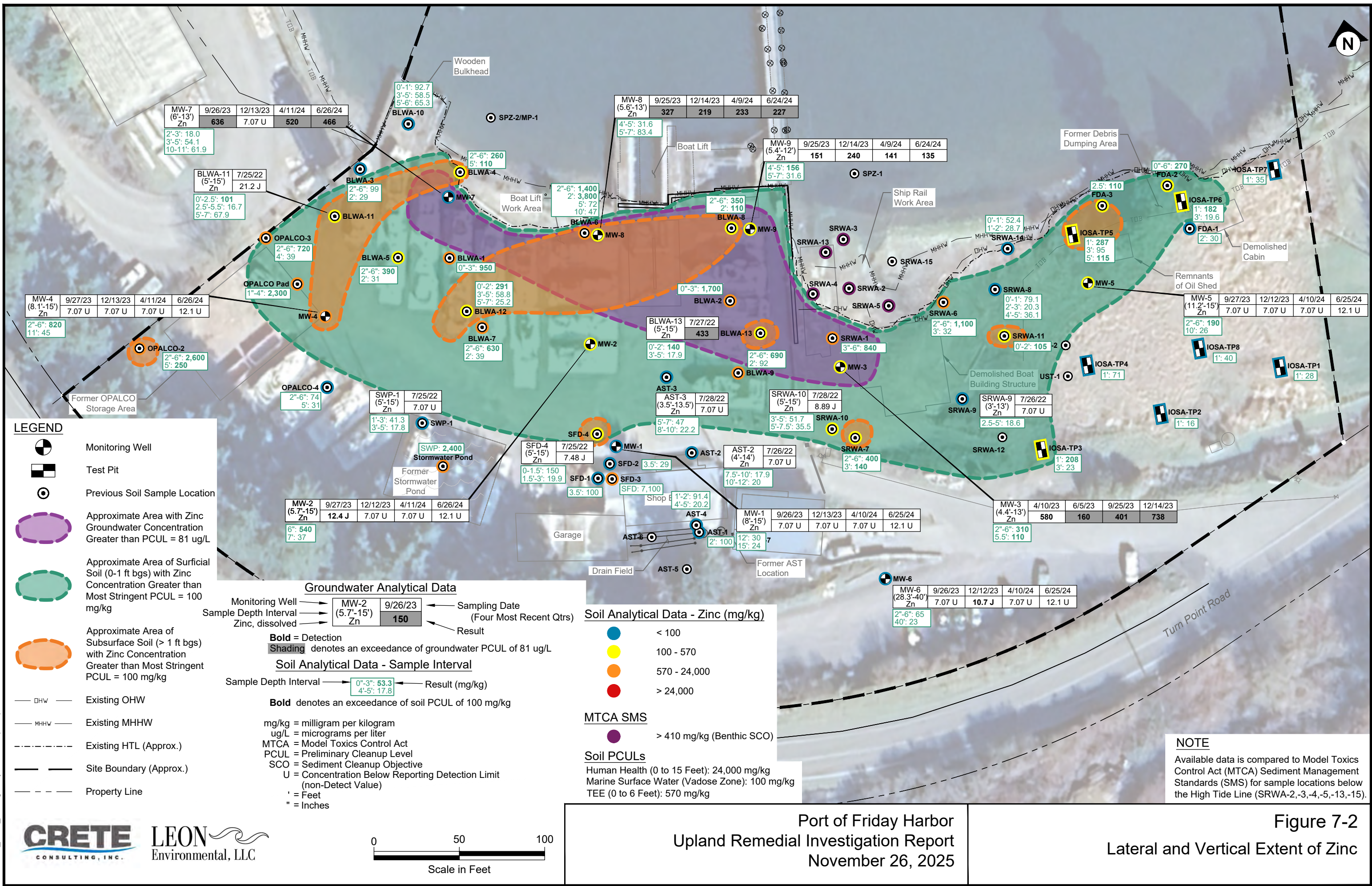






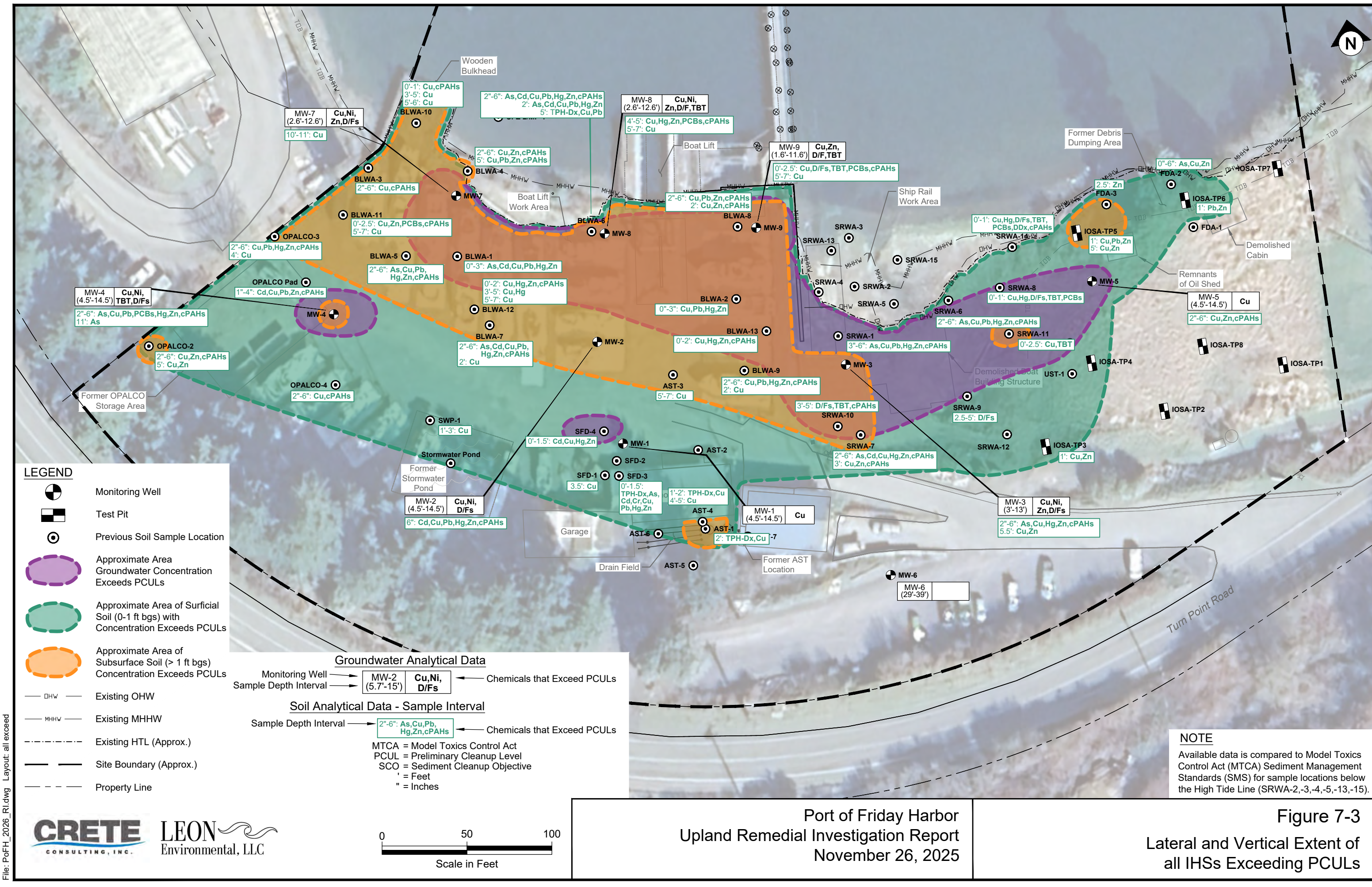
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November 26, 2025

Figure 7-1
Lateral and Vertical Extent of Copper



Port of Friday Harbor
Upland Remedial Investigation Report
November 26, 2025

Figure 7-2
Lateral and Vertical Extent of Zinc



Appendix A

Boring and Monitoring Well Logs

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Appendix A

Boring and Monitoring Well Logs

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

GeoProbe Boring Log

Total Depth: 5.0 ft.

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 10.0 ft.

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: BLWA-7	Logged by: Thom Davis - WES
Location: Center south side of lift area	First Encountered Water: None
Date Completed: 7/30/2018	Total Depth: 5.0 ft.

Sheet: 1 of 1
Drilled by: Kyle Ceruti - Cascade
Logged by: Thom Davis - WES
First Encountered Water: None
Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: BLWA-8	Logged by: Thom Davis - WES
Location: Northeast corner of lift area	First Encountered Water: None
Date Completed: 7/30/2018	Total Depth: 5.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: BLWA-8	Logged by: Thom Davis - WES
Location: Northeast corner of lift area	First Encountered Water: None
Date Completed: 7/30/2018	Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: BLWA-9	Logged by: Thom Davis - WES
Location: Southeast boring in lift area	First Encountered Water: None
Date Completed: 7/30/2018	Total Depth: 5.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: BLWA-9	Logged by: Thom Davis - WES
Location: Southeast boring in lift area	First Encountered Water: None
Date Completed: 7/30/2018	Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 4.0 ft.

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GeoProbe Boring Log

Total Depth: 5.0 ft.

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	S
Client: Port of Friday Harbor	D
Boring Number: SRWA-4	L
Location: In the rail line at NW corner of area	F
Date Completed: 8/1/2018	T

Sheet: 1 of 1

Drilled by: Kyle Ceruti - Cascade

Logged by: Thom Davis - WES

First Encountered Water: 2.0 ft.

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 5.0 ft.

Depth	Description	Screening Depth	PID (ppm)	Sheen	Sample
0.0 to ~2.0 ft.	Driller noted limited recovery from 0 to 2 ft. Organic silty sand and gravel, brown, soft, moist.		1.5	VSS	2 to 6 in.
2.0 to 3.5 ft.	Woody debris and organic silt.		36.7	NS	3.5 ft.
3.5 to 5.0 ft.	Highly organic silty sand with gravel, dark brown to black, soft, wet.		24.1	VSS*	5 ft.
Soil Sample Collection Depth					

* - indicates a weathered sheen.

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: SRWA-6	Logged by: Thom Davis - WES
Location: East side near the center	First Encountered Water: 3.0 ft.
Date Completed: 8/1/2018	Total Depth: 5.0 ft.

Drilled by: Kyle Ceruti - Cascade

First Encountered Water: 3.0 ft.

Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: SRWA-7	Logged by: Thom Davis - WES
Location: Southwest corner of rail area	First Encountered Water: None
Date Completed: 8/1/2018	Total Depth: 5.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: SRWA-7	Logged by: Thom Davis - WES
Location: Southwest corner of rail area	First Encountered Water: None
Date Completed: 8/1/2018	Total Depth: 5.0 ft.

[illegible]

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GeoProbe Boring Log

Total Depth: 15.0 ft.

[illegible]

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GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-2	Logged by: Thom Davis - WES
Location: South side of boat lift work area	First Encountered Water: 7.0 ft.
Date Completed: 7/30/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-2	Logged by: Thom Davis - WES
Location: South side of boat lift work area	First Encountered Water: 7.0 ft.
Date Completed: 7/30/2018	Total Depth: 15.0 ft.

[illegible]

WHATCOM ENVIRONMENTAL SERVICES INC.
www.whatcomenvironmental.com

WHATCOM ENVIRONMENTAL SERVICES INC.
www.whatcomenvironmental.com

NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

GeoProbe Boring Log

Total Depth: 15.0 ft.

[illegible]

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NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-4	Logged by: Thom Davis - WES
Location: At OPALCO pad, east corner	First Encountered Water: ~8.0 ft.
Date Completed: 7/31/2018	Total Depth: 15.0 ft.

[illegible]

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NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

GeoProbe Boring Log

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-5	Logged by: Thom Davis - WES
Location: Upland area to the east of shipyard	First Encountered Water: ~10.0 ft.
Date Completed: 8/1/2018	Total Depth: 15.0 ft.

Project: Jensen's Shipyard Assessment	Sheet: 1 of 1
Client: Port of Friday Harbor	Drilled by: Kyle Ceruti - Cascade
Boring Number: MW-5	Logged by: Thom Davis - WES
Location: Upland area to the east of shipyard	First Encountered Water: ~10.0 ft.
Date Completed: 8/1/2018	Total Depth: 15.0 ft.

[illegible]

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NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

GeoProbe Boring Log

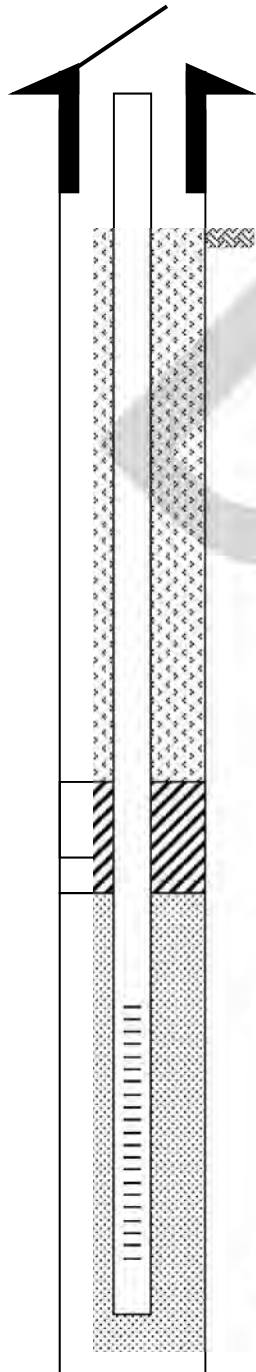
Total Depth: 40.0 ft.

[illegible]**WHATCOM ENVIRONMENTAL SERVICES INC.**

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NS = No Sheen; VSS = Very Slight Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Well Design Specifications



Depths in
Feet Below
Ground
Surface

1.5
2.5
4.5
14.5
15
15

Not to Scale

Elevations (feet): Top of Casing: 13.40 ft
Mean Sea Level (MSL) Ground Elevation: 13.80 ft

Coordinates: 563866.1635 E 1115539.121 N

Coordinate System:

Type of Casing: PVC (Pre-Packed Well Screen)

Casing Diameter: 2 inches

Screen Slot: 0.01 inch

Screen Style: Machine cut

Sand Pack: 2/12 Silica

Bentonite Seal: Medium Chip

Grout Type: N/A **Weight:**

Bore Hole Diameter: 4.0 inches

Drill Rig: GeoProbe

Drilled by: Kyle Ceruti - Cascade Drilling

Logged by: Thom Davis - Whatcom Env.

Completion Date: 7/30/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/28/2018	8.23	5.17	7.76	0.364

Comments:

Project: Jensen's Shipyard Assessment

Location: North of Shop Building

Whatcom Environmental Services

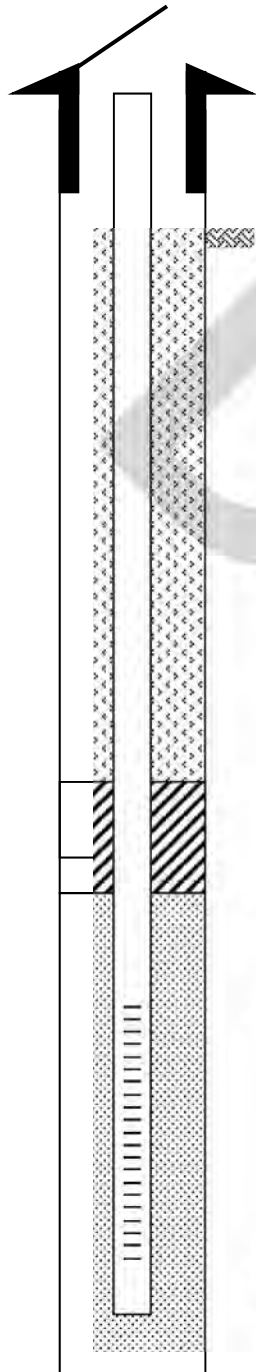
228 East Champion Street #101
Bellingham, WA 98225
(360) 752-9571

MW-1

Ecology Well ID:

BKF-620

Well Design Specifications



Not to Scale

Elevations (feet):
Mean Sea Level (MSL)

Top of Casing: 10.84 ft
Ground Elevation: 11.30 ft

Coordinates: 563927.7653 E 1115534.623 N

Coordinate System:

Type of Casing: PVC (Pre-Packed Well Screen)

Casing Diameter: 2 inches

Screen Slot: 0.01 inch

Screen Style: Machine cut

Sand Pack: 2/12 Silica

Bentonite Seal: Medium Chip

Grout Type: N/A **Weight:**

Bore Hole Diameter: 4.0 inches

Drill Rig: GeoProbe

Drilled by: Kyle Ceruti - Cascade Drilling

Logged by: Thom Davis - Whatcom Env.

Completion Date: 7/30/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/28/2018	5.99	4.85	8.02	5.854

Comments:

Project: Jensen's Shipyard Assessment

Location: Center of Property

Whatcom Environmental Services

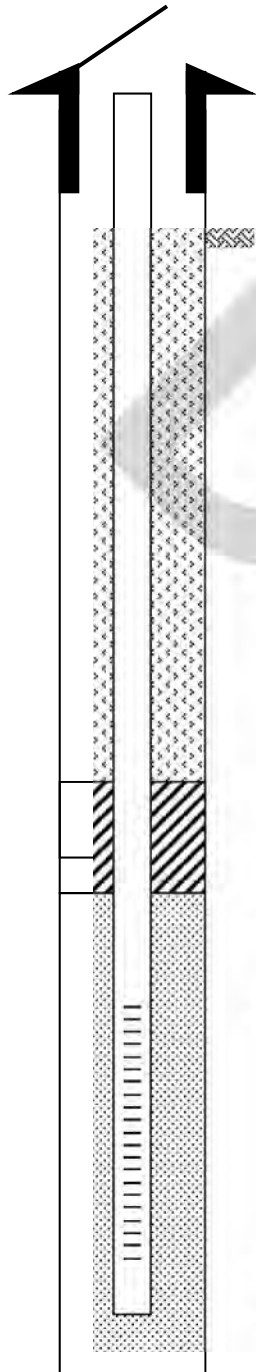
228 East Champion Street #101
Bellingham, WA 98225
(360) 752-9571

MW-2

Ecology Well ID:

BKF-621

Well Design Specifications



Depths in
Feet Below
Ground
Surface

1.5
2
3
12.5
13
13

Elevations (feet):
Mean Sea Level (MSL)

Top of Casing: 9.69 ft
Ground Elevation: 10.00 ft

Coordinates: 563889.1659 E 1115676.466 N

Coordinate System:

Type of Casing: PVC (Pre-Packed Well Screen)

Casing Diameter: 2 inches

Screen Slot: 0.01 inch

Screen Style: Machine cut

Sand Pack: 2/12 Silica

Bentonite Seal: Medium Chip

Grout Type: N/A **Weight:**

Bore Hole Diameter: 4.0 inches

Drill Rig: GeoProbe

Drilled by: Kyle Ceruti - Cascade Drilling

Logged by: Thom Davis - Whatcom Env.

Completion Date: 8/1/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/28/2018	4.57	5.12	8.29	4,839

Comments:

Project: Jensen's Shipyard Assessment

Location: At Rail Works Area

Not to Scale

Whatcom Environmental Services

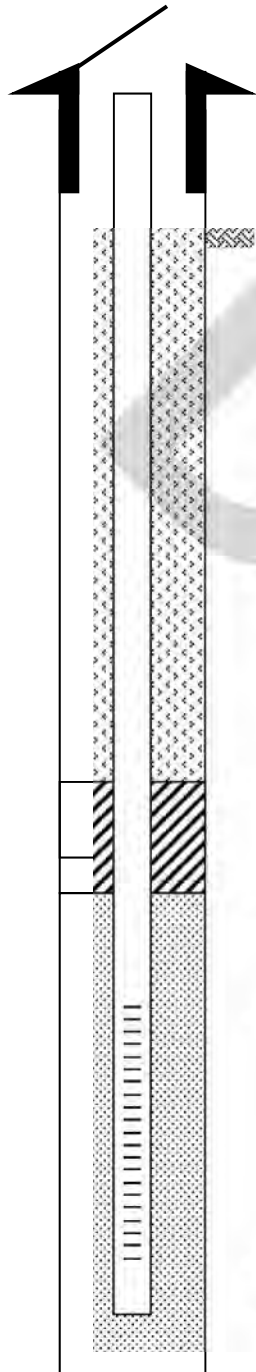
228 East Champion Street #101
Bellingham, WA 98225
(360) 752-9571

MW-3

Ecology Well ID:

BKF-625

Well Design Specifications



Depths in
Feet Below
Ground
Surface

1.5
3.5
4.5
14.5
15
15

Elevations (feet):
Mean Sea Level (MSL)

Top of Casing: 12.90 ft
Ground Elevation: 13.30 ft

Coordinates: 563970.725 E 1115384.588 N

Coordinate System:

Type of Casing: PVC (Pre-Packed Well Screen)

Casing Diameter: 2 inches

Screen Slot: 0.01 inch

Screen Style: Machine cut

Sand Pack: 2/12 Silica

Bentonite Seal: Medium Chip

Grout Type: N/A **Weight:**

Bore Hole Diameter: 4.0 inches

Drill Rig: GeoProbe

Drilled by: Kyle Ceruti - Cascade Drilling

Logged by: Thom Davis - Whatcom Env.

Completion Date: 7/31/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/28/2018	8.09	4.81	7.99	0.351

Comments:

Project: Jensen's Shipyard Assessment

Location: Esatern corner of the OPALCO Pad

Not to Scale

Whatcom Environmental Services

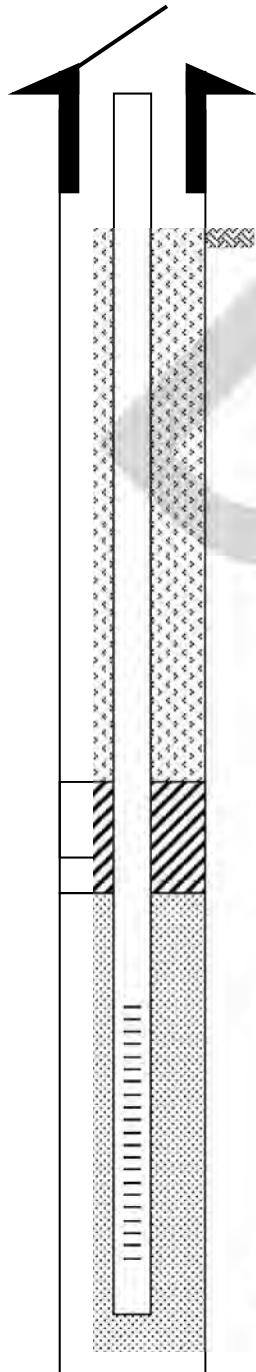
228 East Champion Street #101
Bellingham, WA 98225
(360) 752-9571

MW-4

Ecology Well ID:

BKF-622

Well Design Specifications



Depths in
Feet Below
Ground
Surface

1.5
3.5
4.5
14.5
15
15

Not to Scale

Elevations (feet): Top of Casing: 15.89 ft
Mean Sea Level (MSL) Ground Elevation: 16.20 ft
Coordinates: 563912.3454 E 1115827.778 N
Coordinate System:
Type of Casing: PVC (Pre-Packed Well Screen)
Casing Diameter: 2 inches
Screen Slot: 0.01 inch
Screen Style: Machine cut
Sand Pack: 2/12 Silica
Bentonite Seal: Medium Chip
Grout Type: N/A **Weight:**
Bore Hole Diameter: 4.0 inches
Drill Rig: GeoProbe
Drilled by: Kyle Ceruti - Cascade Drilling
Logged by: Thom Davis - Whatcom Env.
Completion Date: 8/1/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/29/2018	10.81	5.08	7.42	0.513

Comments:

Project: Jensen's Shipyard Assessment

Location: In grass east of shipyard

Whatcom Environmental Services

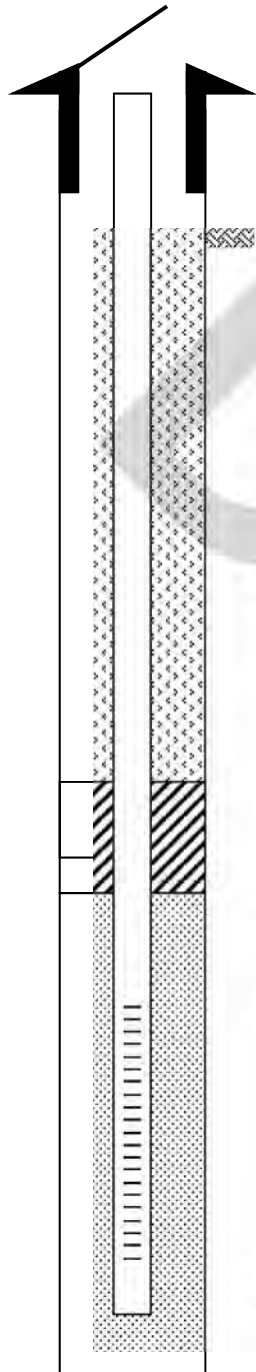
228 East Champion Street #101
 Bellingham, WA 98225
 (360) 752-9571

MW-5

Ecology Well ID:

BKF-624

Well Design Specifications



Depths in
Feet Below
Ground
Surface

2
25
29
39
39.5
40

Elevations (feet):
Mean Sea Level (MSL)

Top of Casing: 33.69 ft
Ground Elevation: 34.30 ft

Coordinates: 563762.4971 E 1115680.978 N

Coordinate System:

Type of Casing: PVC (Pre-Packed Well Screen)

Casing Diameter: 2 inches

Screen Slot: 0.01 inch

Screen Style: Machine cut

Sand Pack: 2/12 Silica

Bentonite Seal: Medium Chip

Grout Type: N/A **Weight:**

Bore Hole Diameter: 4.0 inches

Drill Rig: GeoProbe

Drilled by: Kyle Ceruti - Cascade Drilling

Logged by: Thom Davis - Whatcom Env.

Completion Date: 7/31/2018

Date of Measurement	D-T-W (ft. bgs)	Water Level (ft. MSL)	Field pH	Field EC (mS/cm)
8/29/2018	28.62	5.07	-	-

Comments:

Project: Jensen's Shipyard Assessment

Location: Upper Parking Lot - Background well

Not to Scale

Whatcom Environmental Services

228 East Champion Street #101
Bellingham, WA 98225
(360) 752-9571

MW-6

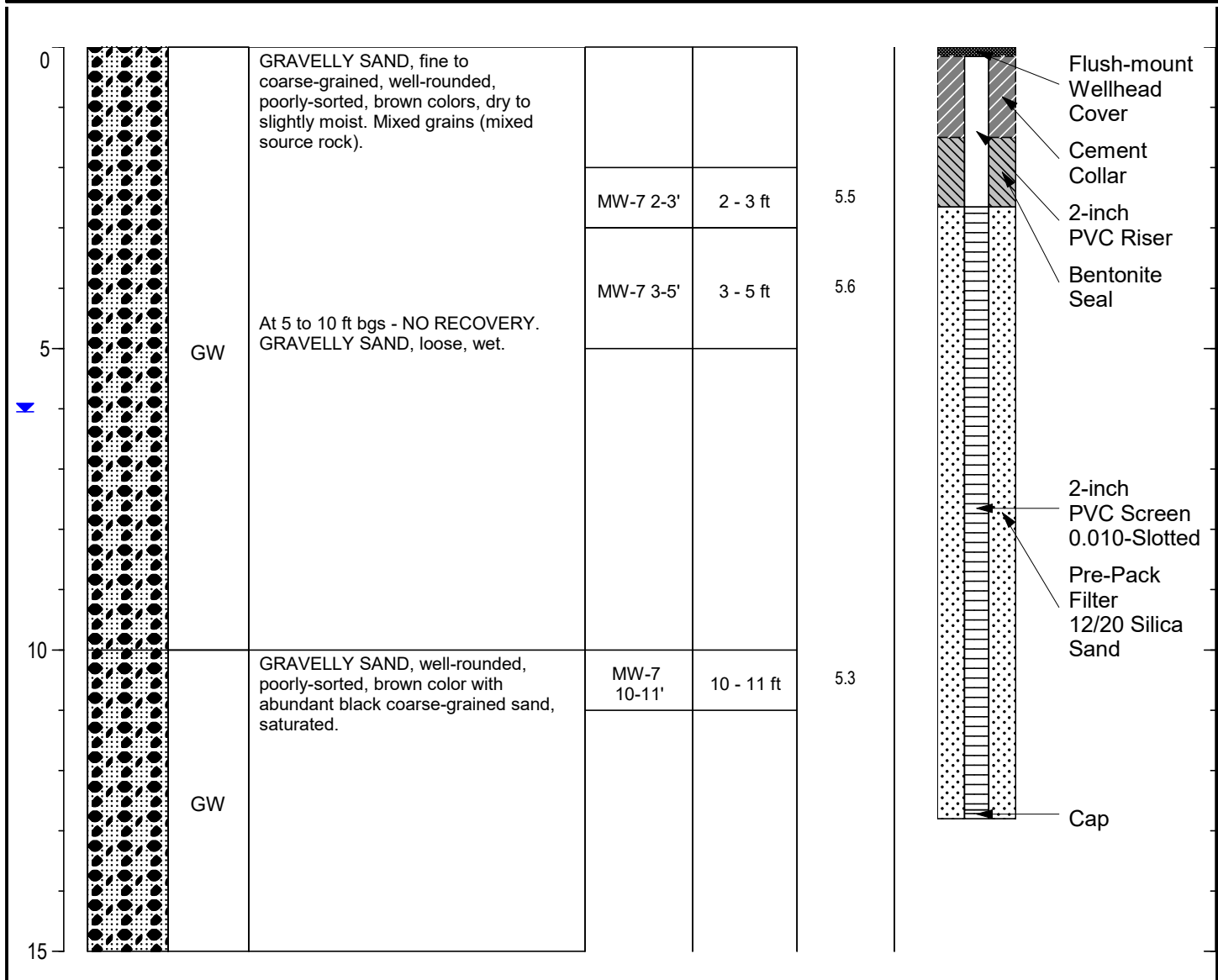
Ecology Well ID:

BKF-623

WELL LOG

BORING/WELL ID: **MW-7**
INSTALLED DEPTH: **12.85-ft bgs**

PROJECT INFORMATION				DRILLING INFORMATION				
PROJECT: Jensen & Sons Shipyard and Marina				DRILLING CO.:		Holt Services/Michael Running		
SITE LOCATION: 1293 Turn Point Road Friday Harbor, WA				DRILLING METHOD:		Hollow Stem Auger		
LOGGED BY: Rusty Jones				EQUIPMENT TYPE:		Geoprobe 7822 DT Macrocore		
PROJECT MANAGER: G. Hainsworth				SAMPLING METHOD:		MC5 5-ft cores		
DATES DRILLED/INSTALLED: 7/27/2022				DRILLED DEPTH:		15-ft bgs		
LATITUDE: 48.525961° N				INITIAL WATER DEPTH:		~5-ft bgs		
LONGITUDE: 122.99990417° W				SCREENED INTERVAL:		2.6-12.6 ft bgs		
DEPTH	SOIL LOG	USCS	DESCRIPTION	SAMPLE ID	SAMPLE DEPTH (ft bgs)	PID (ppm) DPT	WELL CONSTRUCT.	WELL DESC.





Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

- ☒ Construction
☐ Decommission $\Rightarrow$ Original NOI No. _____

Ecology Well ID Tag No. BRK 577

Site Well Name _____

Consulting Firm Crete

Was a variance approved for this well/boring? ☐ Yes ☐ No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer

Name (Print Last, First Name) Running Michael

Driller/Engineer/Trainee Signature [Signature]

License No. 3905

Company Name Nolt Geosia Inc

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. PE23242

Type of Well:

- ☒ Resource Protection Well ☐ Injection Point
☐ Remediation Well ☐ Grounding Well
☐ Geotechnical Soil Boring ☐ Ground Source Heat Pump
☐ Environmental Boring ☐ Other _____

☒ Soil- ☐ Vapor- ☐ Water-sampling

Property Owner Pt. of Friday Harbor

Well Street Address 1000 1/2 Turn Point Rd

City Friday Harbor County San Juan

Tax Parcel No. _____

Location (see instructions):

WWM ☐ or EWM ☐

SW 1/4-1/4 NE 1/4, Section 13 Town 35N Range 3W

Latitude (Example: 47.12345) 48.526004

Longitude (Example: -120.12345) -122.9999230

(WGS 84 Coordinate System)

Borehole diameter 4.25 inches Casing diameter 2 inches

Static water level 5 ft below top of casing Date 7/27/22

☐ Above-ground completion with bollards ☒ Flush monument

☒ Stick-up of top of well casing _____ ft above ground surface

Start Date 7/27/22 Completed Date 7/28/22

Construction/Design

Well Data

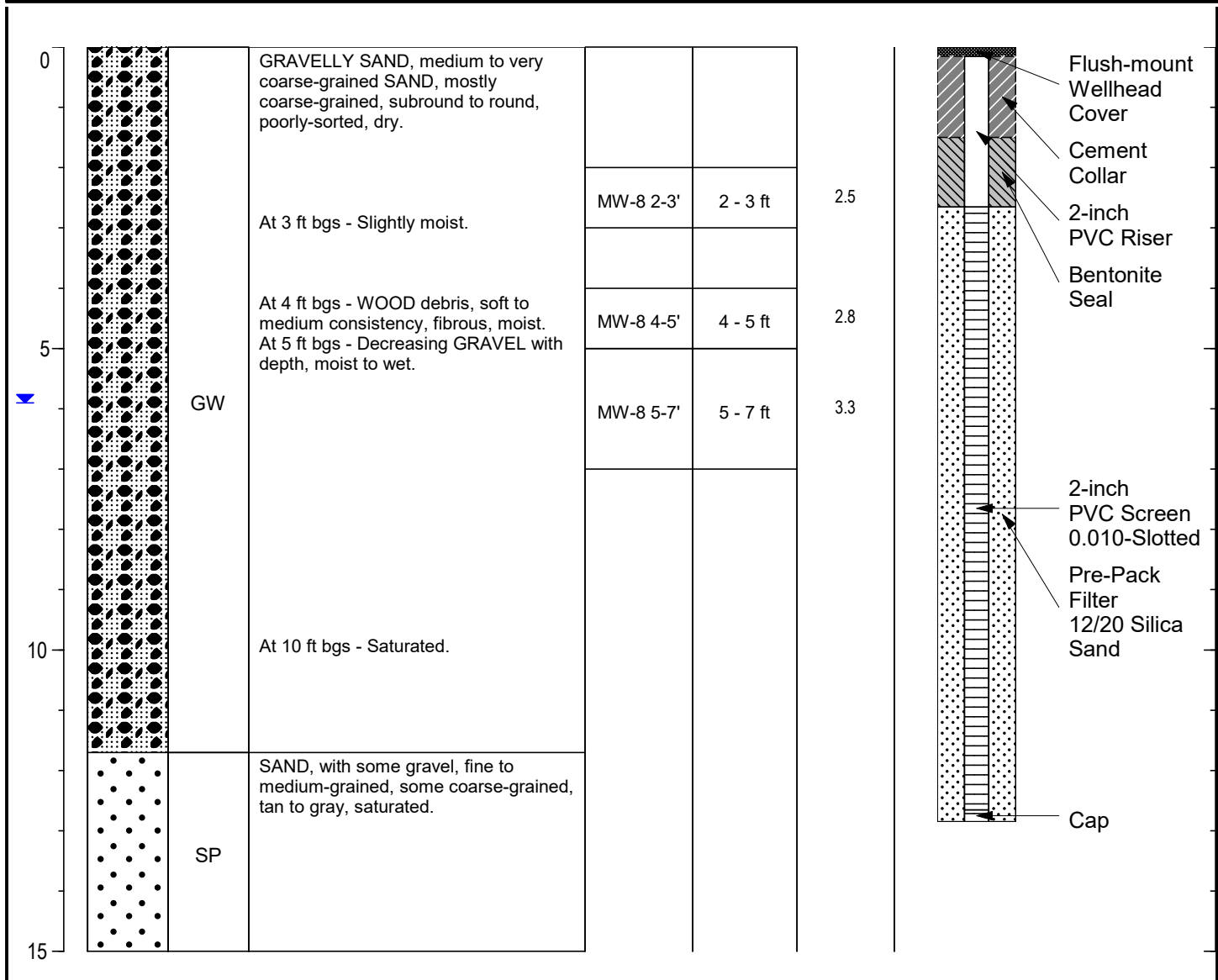
Formation Description

	MONUMENT TYPE: <u>9" Augh</u>	0 - 5 ft. sand & gravel 5 - 10 ft. sand w/ coarse gravel 10 - 15 ft. silty sand and gravel ft. ft. ft. REMARKS
	CONCRETE SURFACE SEAL <u>1 ft.</u>	
	PVC BLANK <u>2" x 3'</u>	
	BACKFILL <u>1.5 ft.</u> TYPE: <u>Medium Bunkerite</u> <u>Chips</u>	
	PVC SCREEN <u>2" x 10'</u> SLOT SIZE: <u>10</u> TYPE: _____	
	GRAVEL PACK <u>10.5 ft.</u> MATERIAL: <u>12-20</u> <u>Silica Sand</u>	
	WELL DEPTH <u>13'</u>	

WELL LOG

BORING/WELL ID: **MW-8**
INSTALLED DEPTH: **12.80-ft bgs**

PROJECT INFORMATION				DRILLING INFORMATION				
PROJECT: Jensen & Sons Shipyard and Marina				DRILLING CO.: Holt Services/Michael Running				
SITE LOCATION: 1293 Turn Point Road Friday Harbor, WA				DRILLING METHOD: Hollow Stem Auger				
LOGGED BY: Rusty Jones				EQUIPMENT TYPE: Geoprobe 7822 DT Macrocore				
PROJECT MANAGER: G. Hainsworth				SAMPLING METHOD: MC5 5-ft cores				
DATES DRILLED/INSTALLED: 7/28/2022				TOC Elevation 9.39 ft MLLW				
LATITUDE: 48.52586639° N				DRILLED DEPTH: 15-ft bgs				
LONGITUDE: 122.99955889° W				INITIAL WATER DEPTH: 6-ft bgs				
				SCREENED INTERVAL: 2.6-12.6 ft bgs				
DEPTH	SOIL LOG	USCS	DESCRIPTION	SAMPLE ID	SAMPLE DEPTH (ft bgs)	PID (ppm) DPT	WELL CONSTRUCT.	WELL DESC.





Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

☒ Construction

☐ Decommission $\Rightarrow$ Original NOI No. _____

Ecology Well ID Tag No. BPK 578

Site Well Name _____

Consulting Firm Crete

Was a variance approved for this well/boring? ☐ Yes ☐ No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer

Name (Print Last, First Name) Runnins Michael

Driller/Engineer/Trainee Signature [Signature]

License No. 3205

Company Name Molt Serial Inc

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. DE23242

Type of Well:

☒ Resource Protection Well

☐ Remediation Well

☐ Geotechnical Soil Boring

☐ Environmental Boring

☐ Injection Point

☐ Grounding Well

☐ Ground Source Heat Pump

☐ Other _____

☐ Soil- ☐ Vapor- ☐ Water-sampling

Property Owner Pt of Friday Harbor

Well Street Address 1000000 Turn Point Rd

City Friday Harbor County San Juan

Tax Parcel No. _____

Location (see instructions):

WWM ☐ or EWM ☐

SW $\frac{1}{4}$ - $\frac{1}{4}$ NE $\frac{1}{4}$, Section 13 Town 35n Range 3w

Latitude (Example: 47.12345) 48.5260774

Longitude (Example: -120.12345) -123.0011354

(WGS 84 Coordinate System)

Borehole diameter 4.25 inches Casing diameter 2 inches

Static water level 5 ft below top of casing Date 7/27/22

☐ Above-ground completion with bollards ☒ Flush monument

☒ Stick-up of top of well casing _____ ft above ground surface

Start Date 7/27/22 Completed Date 7/28/22

Construction/Design

Well Data

Formation Description

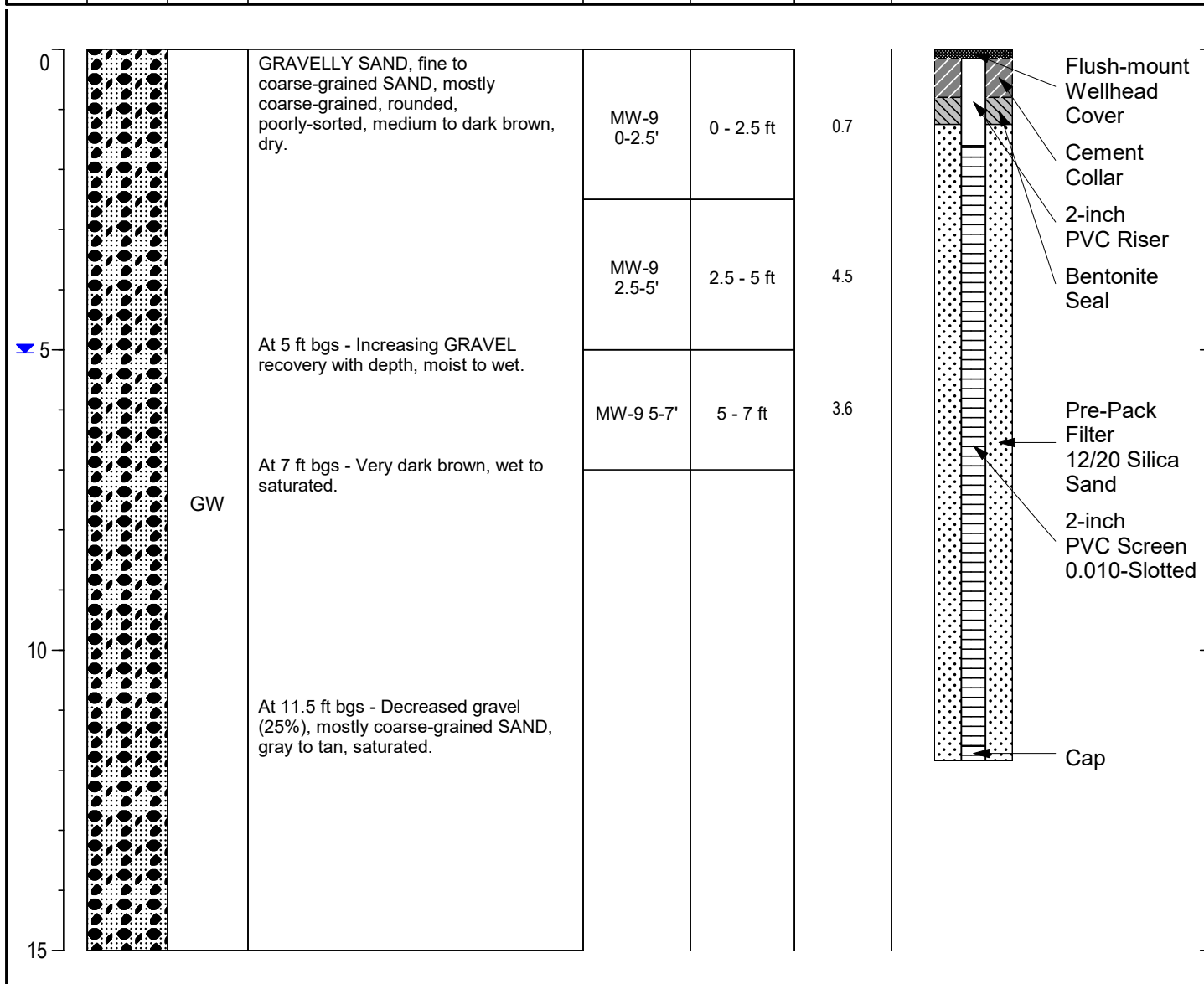
	MONUMENT TYPE:	<u>9" Flush</u>
	CONCRETE SURFACE SEAL	<u>1 ft</u>
	PVC BLANK	<u>2" x 3'</u>
	BACKFILL	<u>1.5 ft</u>
	TYPE:	<u>Medium Bentonite Chips</u>
	PVC SCREEN	<u>2" x 10'</u>
	SLOT SIZE:	<u>.10</u>
	TYPE:	_____
	GRAVEL PACK	<u>10.5 ft</u>
	MATERIAL:	<u>12-20 Silica Sand</u>
WELL DEPTH <u>13</u> ft		
Formation Description		
<u>0 - 5 ft</u> <u>sand & gravel</u>		
<u>5 - 10 ft</u> <u>sand w/ coarse gravel</u>		
<u>10 - 15 ft</u> <u>silty sand and gravel</u>		
_____ ft		
_____ ft		
_____ ft		
REMARKS		

WELL LOG

BORING/WELL ID: **MW-9**
INSTALLED DEPTH: **11.84-ft bgs**

PROJECT INFORMATION				DRILLING INFORMATION			
PROJECT: Jensen & Sons Shipyard and Marina				DRILLING CO.: Holt Services/Michael Running			
SITE LOCATION: 1293 Turn Point Road Friday Harbor, WA				DRILLING METHOD: Hollow Stem Auger			
LOGGED BY: Rusty Jones				EQUIPMENT TYPE: Geoprobe 7822 DT Macrocore			
PROJECT MANAGER: G. Hainsworth				SAMPLING METHOD: MC5 5-ft cores			
DATES DRILLED/INSTALLED: 7/27/2022				TOC Elevation 9.34 ft MLLW			
LATITUDE: 48.52584028° N				DRILLED DEPTH: 15-ft bgs			
LONGITUDE: 122.99919278° W				INITIAL WATER DEPTH: ~5-ft bgs			
				SCREENED INTERVAL: 1.6-11.6 ft bgs			

DEPTH	SOIL LOG	USCS	DESCRIPTION	SAMPLE ID	SAMPLE DEPTH (ft bgs)	PID (ppm) DPT	WELL CONSTRUCT.	WELL DESC.
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DEPARTMENT OF
ECOLOGY
State of Washington

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

☒ Construction

☐ Decommission $\Rightarrow$ Original NOI No. _____

Ecology Well ID Tag No. BPK 576

Site Well Name _____

Consulting Firm Crete

Was a variance approved for this well/boring? ☐ Yes ☐ No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

☒ Driller ☐ Trainee ☐ Engineer

Name (Print Last, First Name) Running Michael

Driller/Engineer/Trainee Signature [Signature]

License No. 3205

Company Name Holt Service Inc

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. PE23242

Type of Well:

☒ Resource Protection Well

☐ Remediation Well

☐ Geotechnical Soil Boring

☐ Environmental Boring

☐ Soil- ☐ Vapor- ☐ Water-sampling

☐ Injection Point

☐ Grounding Well

☐ Ground Source Heat Pump

☐ Other _____

Property Owner Pt. of Friday Harbor

Well Street Address 1000 1/2 Turn Post Rd

City Friday Harbor County San Juan

Tax Parcel No. _____

Location (see instructions):

WWM ☐ or EWM ☐

SW 1/4-1/4 NE 1/4, Section 13 Town 35N Range 3W

Latitude (Example: 47.12345) 48.5260774

Longitude (Example: -120.12345) -123.0011354

(WGS 84 Coordinate System)

Borehole diameter 4.25 inches Casing diameter 2 inches

Static water level 5 ft below top of casing Date 7/27/22

☐ Above-ground completion with bollards ☒ Flush monument

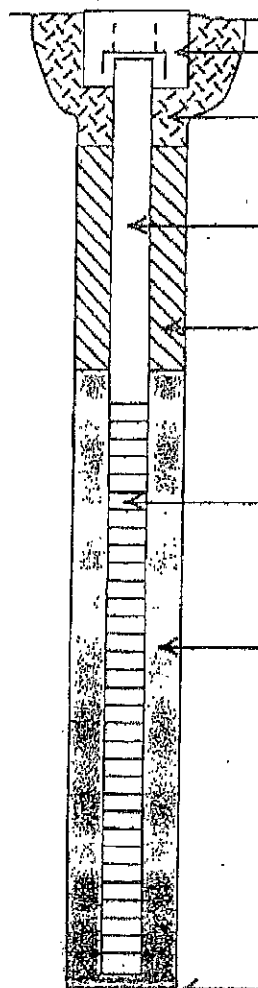
☒ Stick-up of top of well casing _____ ft above ground surface

Start Date 7/27/22 Completed Date 7/28/22

Construction/Design

Well Data

Formation Description



MONUMENT TYPE:

9" Plug

CONCRETE SURFACE SEAL

1 ft

PVC BLANK 2" x 3'

BACKFILL 1.5 ft

TYPE: Medium Bentonite Chips

PVC SCREEN 2" x 10'

SLOT SIZE: 10

TYPE: _____

GRAVEL PACK 10.5 ft

MATERIAL: 12-20

Silica Sand

WELL DEPTH 13 "

0 - 5 ft
Sand & gravel

5 - 10 ft
Sand w/ coarse gravel

10 - 15 ft
silty sand and gravel

_____ ft

_____ ft

REMARKS

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SWP-1		
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor		Sheet 1 of 1		
Logged By: Rusty Jones (CRETE)		Date	Started: 7/25/2022 1100		Tooling: MacroCore MC5	
Drill Crew: Michael Running			Completed: 7/25/2022 1155		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite Chips		Borehole Diameter: ~2" 3/4" PVC	
				Hammer Type/Weight:		Drill Rig Type: GeoProbe 7822 BT
		Groundwater Depth (ft bgs): ~9 (very approximate)				Total Depth of Boring (ft bgs): 15

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/feet)	Sample ID, Depth, Time	Lithology/Notes
	0-5'	0.7	45%	1-3' 1105	0-5' Mixed Fill, sandy gravel, well-rounded, med.-dk brown, poor REC. med-c.g., dry-sli. moist
	5-10'	0.8	15%	3-5' 1110	5-10' v. poor REC. SAA, dry-sli. moist
	10-15'	0.8	70%	5-10' 1115	10-12' SAA or slough, sl. moist
	5-10'			10-12' 1125	~12' moist to wet
				10-12' 1140	~13' Inc. Gravel, dec. c.g. sand, wet GRAVEL w/ c.g. sand,
					PVC temp well 3/4" screened 5-15', no filter pack - would go dry w/ per. pump readily, but wait 1-2 minutes to recharge - Collected filtered & unfiltered metals - DW @ ~9' bgs in PVC @ very end

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. AST-Z		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)				Tooling: Macrocore MCS		
Drill Crew: Michael Running		Date	Started: 7.26.22 0730		Drilling Contractor: Holt Services	
USA Ticket Number:			Completed: 7.26.22 0845		Borehole Diameter: 2+ "	
		Backfilled: Bentonite Chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT
Rec %		Groundwater Depth (ft bgs): 8.7 @ 0845				Total Depth of Boring (ft bgs): 15

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-2.5'	0.4	50%	AST-Z @ 0830 10+2	0-5' Poor Recovery Gravelly SAND, poorly-sorted, med-cq, well rounded, med-dk brown, dry - sl. moist
5-10'	2.5-5'	0.5	50%	AST-Z @ 0830 10+2	5-10' S&A mostly 5-8' S&A, sl. moist @ 8-9' moist, inc. organic fines (minor) dk brown-black, 9-10' dk brown-black, no odor, moist to wet V. faint HC odor
10-15'	5-7.5'	0.9	85%	AST-Z @ 0830 10+2	10-15' Gravelly Sand, med-cq, poorly-sorted, well-rounded, GRAY, wet, faint hydrocarbon odors
10-12'	7.5-10'	41.2	25.4	AST-Z @ 0830 10+2	Grab sample pre-purged ~1-2 gal. PVC 3/4" Screen @ 4-14' Duplicate for TPH-Dx -Gx — DUP-220726- Low RS @ 0730 1-grab WQM reading after sampling temp 18°C DO 1.37 mg/L SPC 550 uS/cm TDS 358 mg/L PH 7.89 ORP -162.3 mV NTU 92.52 NTU

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. AST-3		 Sheet 1 of 1		
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor						
Logged By: Rusty Jones (CRETE)		Date	Started: 7.28.22 1035		Tooling: Macrocore MC5		Drilling Contractor: Holt Services	
Drill Crew: Michael Running			Completed: 7.28.22 1150				Borehole Diameter: 2+ inches	
USA Ticket Number:			Backfilled: Bentonite chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT	
		Groundwater Depth (ft bgs): ~6.55 @ 1143				Total Depth of Boring (ft bgs): 15		

Depth (feet)	Sample Depth	PID (ppm)	Rec. %	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	2-4'	4.8	50%		1110	1 x 0-5' DPT core
5-10'	4-5'	3.9			1115	20-4' GRAVELLY SAND, fq-veg, mostly med-cg, poorly-sorted subrd-rd, dry-sl. moist, ~1.5" dia @ ~1.5-2' large wood (3-4" thick)
	5-7'	6.1	70%		1120	4-5' SAND, some Gravel, black, fq-cg (fq-med. mostly), moist-wet, rd, 3.1 cm dia, v. faint HC odor, fq organics
	8-10'	4.0	95%		1130	5-10' SAT, dk brown-black, moist-wet, v. faint reducing odors, fq organics
10-15'	10-12'	4.2			1140	10-15' SAT, dec. Gravel, smaller gravel, sat dk gray
					1150	Grab GW sample from temp well 3/4" PVC screened 3.5-13.5' bgs no filter pack ~2-2.5-gal. pre-purged 1-grab WQAM reading: 18.3 °C DO 2.15 ↓ mg/L SPC 1952 µS/cm TDS 1269 mg/L pH 9.41 ORP -58.2 mV Turb 143 NTU

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. AST-4		 Sheet 1 of 1		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor				
Logged By: Rusty Jones (CRETE)		Date	Started: 7.29.22 0645		Tooling: Hand auger		Drilling Contractor: Holt Services RS	
Drill Crew: NONE			Completed: 7.29.22 0800		4" sand bucket		Borehole Diameter:	
USA Ticket Number:			Backfilled: Soil cuttings		Hammer Type/Weight:		Drill Rig Type: N/A	
Groundwater Depth (ft bgs): N/A				Total Depth of Boring (ft bgs): 5				

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
			100%		No appreciable odors other than septic-related
4-5'	3-4'	1.9	1.7	4-5' 3-4' 0755	Hand auger buckets ~2 buckets / 0.5' depth SAND w/ GRAVEL, fq-vcg, mostly med.-cg, subrd to rd grains of gravel, sl. moist, ≤3" gravel observed topsoil organics ~0-1' @ ~2' increase gray-black organics possibly staining BUT no appreciable odors associated w/ black packets @ ~3-3.5' + Bec. med. gray Faint fetid or reducing odors (adjacent septic system) 4-5' Gray-black, sl. moist to moist
	2.5-3'	3.5	2.5	2.5-3' 0750	
	2-2.5'	7.6	2.6	2-2.5' 0745	
	1-2'			1-2' 0-1'	
	0-1'	0.6	0.6	0-1' 0745	

Project: Jensen's Marina	Project Number: Agreed Order DE18071	Boring No. SFD-4	 Sheet 1 of 1
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor	
Logged By: Rusty Jones (CRETE)	Date Started: 1/25/2022 1300	Tooling: Macrocore MCS	Drilling Contractor: Holt Services
Drill Crew: Michael Running	Completed: 1/25/2022 1350		Borehole Diameter: 2+ "
USA Ticket Number:	Backfilled: Bentonite chips	Hammer Type/Weight:	Drill Rig Type: GeoProbe 7822 DT
	Groundwater Depth (ft bgs): ~9 (very approximate)		Total Depth of Boring (ft bgs): 15 ft

Depth (feet)	Sample Depth	PID (ppm)	Rec. %	Blew Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
	0-1.5'	0.5	40%		0-1.5' 1310	0-5' PER RECOVER. C.G. sandy GRAVEL, dry-sl. moist, med-dk brown, well-rounded, up to 1.5" gravel
	1.5-3'	0.4			1.5-3' 1315	5-10' Gravelly sand, med-cg, sl. moist, moist by 8' med-dk brown
	3-5'	0.3			3-5' 1320	10-15' SAA, wet, dk brown @ ~12.5/13-15' dk gray
	5-10'	0.5	35%		5-10' 1325	Installed temp well 5-15' (screen)
	10-15'	—	45%		10-15' 1335	1335 Grab GW sample for NWTPH-Gx, -Dx, metals,
					SFD-4 5-15' 1335	

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. BLWA-10		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Date		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Started: 7.28.22 0710		Completed: 7.28.22 0745		Drilling Contractor: Holt Services
USA Ticket Number:		Backfilled: Bentonite chip		Hammer Type/Weight:		Borehole Diameter: 2+ inches
Recovery %		Groundwater Depth (ft bgs):				Drill Rig Type: Geoprobe 7822 DT
						Total Depth of Boring (ft bgs): 15

Lithology/Notes

No observed odors, staining, or artificial debris

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-1'	2.3	20% 35%	0-1' 0740	2 x 0-5' DPT cores 20, 35% Rec Poor Recovery
5-6'	1-3'	3.7	45%	1-3' 0745	0-5' GRAVELLY SAND, dry, med-veg, poorly-sorted sub to rounded; 51.5" dia gravel (variable source rock) disturbed FILL
5-6'	3-5'	5.9	80%	3-5' 0750	5-6.5' SAA, sl. moist, dec. sand in core
6-5'	5-6'	1.3		5-6' 0755	6.5-10' SANDY GRAVEL (GRAVELLY SAND) c9-veg, 52 cm dia wet-sat., sub-rd dk brown / some organics 7-9'
10-11.5'					10-11.5' SAA
11.5-15'					11.5-15' SAND, w/ GRAVEL dec. gravel, tan-gray, saturated sub-rd, fq-c9 (dec. grain size), sand is better sorted

7/28/2022 @ 1601 TO 11.81' BTOC DTW N/A post-development F

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. BLWA-11		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.25.2022 1505		Tooling: MacroCore MCS		
Drill Crew: Michael Running		Date	Completed: 7.25.2022 1615		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite chips		Borehole Diameter: 2+"	
		Groundwater Depth (ft bgs): ~6.2' bgs @ 1605		Drill Rig Type: GeoProbe 7822 DT		Total Depth of Boring (ft bgs): 15

Depth (feet)	Sample Depth	PID (ppm)	Rel. %	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-5'	0-2.5'	45%	12.4	57' 0-2.5' 1525	0-5' GRAVELLY SAND, med.-cq @ 0-2' trace roots, dry, light-med. brown, well-rounded, 2-4' sl. moist @ 3' rust-red sand layer @ 4' black sand layer, cq sand
5-10'	5-10'	5-7'	55%	16.2	57' 2.5-5' 1530	5-10' SAA, med-dk brown, med-cq, wet by 7'
10-15'	10-15'		70%		57' 1535	10-13' SLOUGH (dry) 13-15' Sandy Gravel, mostly cq, wet-sat, dk brown - dk gray, well-rounded, gravel up to 1.25"
					BLWA-11 @ 1650 1550	Grab Gw sample 16+4 bottles Pre-purged ~3-4 gal. (recharged very well) ran mostly clear by sampling time

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. BLWA-12		 Sheet 1 of 1
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.25.22 1405		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Date	Completed: 7.25.22 1435		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite chips		Borehole Diameter: 2+ "	
		Groundwater Depth (ft bgs):		Drill Rig Type: GeoProbe 7822 DT		Total Depth of Boring (ft bgs): 15
Rec %						

Depth (feet)	Sample Depth	PID (ppm)	Blow-Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
	0-5'	7.5	0-5' 40%	0-2' 1435 0.2	0-5' POOR RECOVERY. GRAVELLY SAND, dry, med-cg, poorly-sorted, well-rounded
	5-10'	0.8	5-10' 45%	3-5' 1435 0.8	5-10' POOR RECOVERY ~5-6' silt, sl moist ~6-8' becoming moist, silt @ ~8' CLAYEY SILT, w/ fq-med SAND, dk tan, moist-wet
	10-15'	0.4	10-15' 80%	5-7' 1435 0.4	9-10' GRAVELLY SILTY SAND, fq-med, black, abundant organics, minor small roots, wet @ ~9' minor wood seam, roots, wet, black
					10-15' decent Rec. 10-11.5' Gravelly sand, saturated, dk brown, well-rounded 11.5-15' med-cg, sandy GRAVEL, DK-GRAY, wet-saturated, well-rounded
					No Groundwater sample

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. BLWA-13		CRETE CONSULTING, INC. Sheet 1 of 1
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.27.22 0715		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Date	Completed: 7.27.22 0822		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled:		Borehole Diameter: 2+ inches	
			Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 BT	
			Groundwater Depth (ft bgs):			Total Depth of Boring (ft bgs):

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-2'	0.4	40% 45 35 40	0-2' 0740	No odors, no staining, no artificial debris observed No shells, no obvious contamination impacts
5-10'	3-5'	0.4	60% 45 35 40	3-5' 0750	0-5' GRAVELLY SAND, med-cg, well-rounded, browns, dk brown, sl. moist, poor RECOVERY
10-15'	5-8'	0.4	80% 45 35 40	5-8' 0800	~1' SLOUGH, SAA 5-8' SAA, more GRAVEL, less sand in core, wet ~8-10 SAND, black-dk brown, moist - wet, med. -cg, minor gravel, well-rounded
	8-10'	0.4	80% 45 35 40	8-10' 0810	~10-12.5' SAA (5-8') GRAVEL w/ SAND, slough? saturated ~12.5-15' SAA 8-10' SAND, saturated
				Grab Gwl sample from temporary, well 3/4" PVC, screen ~5-15' No filter pack Recharge nicely, but moderately turbid 1 x 1 Lumber for cPAPs or PCB duplicate No worm or ganging	

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-8				
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor		Sheet 1 of 1				
Logged By: Rusty Jones (CRETE)		Date	Started: 7.26.22 1305		Tooling: Macrocore MCS		Drilling Contractor: Holt Services	
Drill Crew: Michael Running			Completed: 7.26.22 1340				Borehole Diameter: 2 1/2 inches	
USA Ticket Number:			Backfilled: Bentonite chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT	
		Groundwater Depth (ft bgs):				Total Depth of Boring (ft bgs): 10		
Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot) %	Sample ID, Depth, Time	Lithology/Notes			
0-5'	0-1'	1.6	60%, 65%	0-1' 1330	2 x 0-5' DPT pushes, 100%, 65% recovery Some GRASS at surface, minor roots 0-1' SAND w/ Gravel (some), well-rounded, vfg-med, mostly fg med. brown, sl. moist 1-5' SAA, minor variable GRAVEL, sl moist-moist, firm 5-10', SAA, SAND, vfg-fg mostly, minor med. dense sl. moist-moist, brown, rather some GRAVEL, well * Jammed core barrel (dense) * No wet cuttings observed to 10' bgs			
	2-3'	1.7		2-3' 1340				
	4-5'	1.8		4-5' 1350				
5-10'			75%					

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-9			
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor			
Logged By: Rusty Jones (CRETE)		Started: 7.26.2022 1445		Tooling: Macrocore M65		Drilling Contractor: Holt Services	
Drill Crew: Michael Running		Completed: 7.26.2022 1645				Borehole Diameter: 2+ inches	
USA Ticket Number:		Backfilled: Bentonite chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT	
		Groundwater Depth (ft bgs):				Total Depth of Boring (ft bgs): 15	

Depth (feet)	Sample Depth	PID (ppm)	Blew Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-2.5'	2.2	45%	0-2.5' 2.2	temporary well in "lowland" area by old boat building structure in area where old barge was anecdotally/reported shored and "buried"
5-10'	2.5-5'	2.2	50%	2.5-5' 2.2	0-5' 2 DPT pushes 45-50% GRASS @ surface 0-5' POOR RECOVERY GRAVELLY SAND, dry, loose-med. dense, weathered rocks easily fractured w/ DPT
10-15'	5-10'	2.2	80%	5-10' 2.2	5-10' 2.5-1' Slough SAND, fq-med, moist to wet, dk brown, minor-some well-rd gravel, <1" dia' rusty brown mottling (pockets & seams) throughout sampler jammed briefly (dense material, squished liner)
			90-100%	SRWA-9 @ 1545 6+4	Grab water from temp. well 3/4" PVC screened 3-13' bgs (13-15' collapsed prior to PVC insert) POOR RECHARGE → TOOK TO 1645 TO OBTAIN H ₂ O for bottle (2+ hour) INSUFFICIENT WATER FOR SPEC/COND./TEMP visually very turbid, no recharge to clear

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-10		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.28.22 1325		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Date	Completed: 7.28.22 1450		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite chips		Borehole Diameter: 2+ inches	
		Groundwater Depth (ft bgs): 7.75' @ 1440		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT
				Total Depth of Boring (ft bgs): 15		

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	3-5'	1.8	40%	7-5-10' 5-7.5' 3-5' 1410 7	0-5' Limited Recovery SAND, some GRAVEL, subd-rd, fq-cg, minor veg, tan-med. brown, dry, gravel up to 1.5" observed 0-3', recently dug up and re-backfilled 3-5' appears relatively undisturbed, recent undisturbed bl. moist - moist
5-10'	5-7.5'	1.8	70%	7-5-10' 5-7.5' 3-5' 1410 7	5-10' Slough @ top of core SAND, less gravel, fq-cg, mostly fq-med, sat, @ 84 moist - wet
10-15'	7-10'	2.1	85%	7-5-10' 5-7.5' 3-5' 1420 1	10-15 wet-sat, abundant gravel, some org. fines
SRWA-10 @ 1440 7+4 Grab GW sample from temp well 3/4" PVC, screened ~5-15' bgs Pre-purged ~1-1.5 gal. water 1-Grab GW at Readings temp 13.2°C DO 1.65 mg/L Spc 251.3 us/cm TDS 163 mg/L pH 9.42 ORP 34.0 mV Turb. 189 NTU					

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-11		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.26.22 1400		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Date	Completed: 7.26.22 1418		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite chips		Borehole Diameter: 2+ inches	
		Groundwater Depth (ft bgs): Probably dry, not checked		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT
				Total Depth of Boring (ft bgs): 10		

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot) %	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-2.5'	1.9	50%	0-2.5' 1451	1 x 0-5' DPT core ~50-60% Minor GRASS @ surface 0-1' Sand, some gravel, vfq-med, loose-firm, tan-brown, dry 1-5' SAA, dry-sl. moist, dec. GRAVEL
5-10'	2.5-5'	1.0		2.5-5' 1451	5-10' Variable lithology 5-5.5' med-cq SAND, rusty brown bands/scams, sl. moist-moist dk brown 5.5-10' SILTY SAND w/ GRAVEL, vfq-med, dk brown, moist, various weathered minerals throughout (regolith), peppered stains (organics or minerals, well-rounded no noticeable artificial debris

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-12		
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor		Tooling: Macrocore MCS		
Logged By: Rusty Jones (CRETE)		Date	Started: 7.28.22 1250		Drilling Contractor: Holt Services	
Drill Crew: Michael Running			Completed: 7.28.22 1319		Borehole Diameter: 2+ inches	
USA Ticket Number:			Backfilled: Bentonite chips		Hammer Type/Weight:	
Groundwater Depth (ft bgs):				Drill Rig Type: Geoprobe 7822 DT		Total Depth of Boring (ft bgs): 10

Lithology/Notes

No observed odors, staining, or debris

3 x 0-5 DPT cores, 25, 20, 40% POOR RECOVERIES
 0-5' GRAVELLY SAND, fq-cg, well-sorted, sl. moist,
 med. brown, ≤ 2" dia gravel, minor vfg

5-10' SAA
 @ 7' dec. gravel, sl. moist - moist, med. dense
 dk tan - med. brown

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time
0-5'	0-1'			
5-10'	2-3' 0-1'			
	4-5' 2-3' 0-1'			
	7-10' 5-10'			
	1.3 5.6	4.9 2.6 1.8	25% 40% 20%	
	50%			
	4-5' 2-3' 0-1'			
	1320 1315 1310			

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-13		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Started: 7.26.22 0855		Tooling: Macrocore MC5		
Drill Crew: Michael Running		Date	Completed: 7.26.22 0955		Drilling Contractor: Holt Services	
USA Ticket Number:			Backfilled: Bentonite chips		Borehole Diameter: 2+ "	
		Groundwater Depth (ft bgs): ~1 (approx.)		Drill Rig Type: Geoprobe 7822DT		Total Depth of Boring (ft bgs): 10

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
5-10'	0-5'	0.5	70%	3-5' 0.5-1' 0-0.5'	No observed odors, staining, or obvious contamination
	3-5' 0.5-1' 0-0.5'	4.0	33% 35% 25%	0-0.5' 0-0.5' 0-0.5'	3 x 0-5' pushes → POOR RECOVERY SANDY GRAVEL med-cg, well-rounded, poorly-sorted, trace shell fragments 0-1 moist-wet 1+ wet-saturated thin concrete @ 0.5' *Combined 3 x 0-5' cores due to limited soil volume recovery.* Abundant gravel, limited sand matrix for Terracores 5-6/7' sat, saturated 6/7'-9' dec. gravel, most vcg sand, sat, gray ~9-10' FIRM, fq-med, compacted sand, wet, well-drained, tan, undisturbed/native

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-14				
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor				
Logged By: Rusty Jones (CRETE)		Date	Started: 7-26-22 1000		Tooling: Macrocore MCS		Drilling Contractor: Holt Services	
Drill Crew: Michael Running			Completed: 7-26-22 1057				Borehole Diameter: 2+ inch	
USA Ticket Number:			Backfilled: Bentonite chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT	
Rec %		Groundwater Depth (ft bgs):				Total Depth of Boring (ft bgs): 10		
Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes			
5-10'	0-5'	4.0	2x 35-40%	0-1	No observed contamination odors, staining, etc.			
	3-5'	0.5	2x 35-40%	1-2	2 x 0-5' DPT cores 35%-40%			
				1020	0-1' Grass (sea-grass?) at surface, abundant roots (0-0.5')			
				1030	gravelly SAND, moist-wet, mostly med-cg, well-round			
				1040	1-5' dec. gravel SAND, med-cg, browns to dk brown			
				1040	@ 1' wood or root (3-inch thick), wet, well-rounded - 3-0.75"			
				1040	5-10' 5-6.5' SAND, wet-sat.			
				1040	6.5-10' SAND, firm-hard, vfq-fq, trace med-cg, tan-gray			
				1040	well-rounded, undisturbed/native			
				1040	@ 8' small pocket peaty brown sand, native glittery			
				1040	@ 9' up to 0.75" minor gravel, well-rounded			

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SRWA-15				
Location: 1293 Turn Point Road, Friday Harbor WA		Client: Port of Friday Harbor		Sheet 1 of 1				
Logged By: Rusty Jones (CRETE)		Date	Started: 07/26/22 1200		Tooling: Macrocore MCS		Drilling Contractor: Holt Services	
Drill Crew: Michael Running			Completed: 07/26/22 1225				Borehole Diameter: 2 1/2 inches	
USA Ticket Number:			Backfilled: Bentonite chips		Hammer Type/Weight:		Drill Rig Type: Geoprobe 7822 DT	
		Groundwater Depth (ft bgs): 3.7' @ 1222		Total Depth of Boring (ft bgs): 10				

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
5-10'	0-5'				
	2-3' 0.5-1' 0-0.5	1.0 1.5 2.9	95-100%	2-3' 0.5-1' 0-0.5 1250 1240 1230	2 x 0-5' DPT pushes FULL RECOVERY: 2-10 to 0.5' GRAVELLY SAND, med.-cg, well-rounded, poorly-sorted moist to wet, med-dk brown 3 0.5-5 SAND, vfq-fg, trace-minor med-cg, well-rounded v. trace small gravel, dk tan/med.-brown, dense UNDISTURBED/no indications of FILL, well-sorted trace rusty brown mottling in sparse pockets 5-10' SAND, vfq-med, w/ minor gravel, variable source rock gravel, well-rounded, wet, dense, less sorted than 0.5-5' more grain size variability Collected DUP-220726 @ 0800 for TPH-GX

Project: Jensen's Marina		Project Number: Agreed Order DE18071		Boring No. SYC-7, -6, -5		
Location: 1293 Turn Point Road, Friday Harbor WA				Client: Port of Friday Harbor		
Logged By: Rusty Jones (CRETE)		Date		Tooling: Macrocore MCS		
Drill Crew: Michael Running		Started: 7.27.22 1445		Completed: 7.27.22 1515		Drilling Contractor: Holt Services
USA Ticket Number:		Backfilled: Bentonite chips		Hammer Type/Weight:		Borehole Diameter: 2+ inches
Rec. %		Groundwater Depth (ft bgs):				Drill Rig Type: Geoprobe 7822 DT.
						Total Depth of Boring (ft bgs): 5 each

Depth (feet)	Sample Depth	PID (ppm)	Blow Counts (blows/foot)	Sample ID, Depth, Time	Lithology/Notes
0-5'	0-1'	3.2	40%	SYC-7 0-1' @ 1530	SYC-7 1 x 0-5' DPT core → POOR RECOVERY Asphalt @ surface 0-5' Gravelly Sand, dry-sl. moist, ^{sub to} well-sorted, browns, fq-veg, 51.5" dia, poorly sorted no odors, staining, or debris
0-5'	0-1'	3.3	DPT 10%	SYC-6 0-1' @ 1540	SYC-6 1 x 0-5' DPT core → No appreciable recovery LOIS' recovery *SAME AS SYC-7* but GRASS @ surface, v. dry used hand auger 0-1' loose sand w/ gravel, med-cg
0-5'	0-1'	4.3	60%	SYC-5 0-1' @ 1550	SYC-5 1 x 0-5' DPT core 0-5' GRAVELLY SAND, med-veg, poorly-sorted sub to well-sorted, sl. moist rocks/gravel easily fractured by DPT

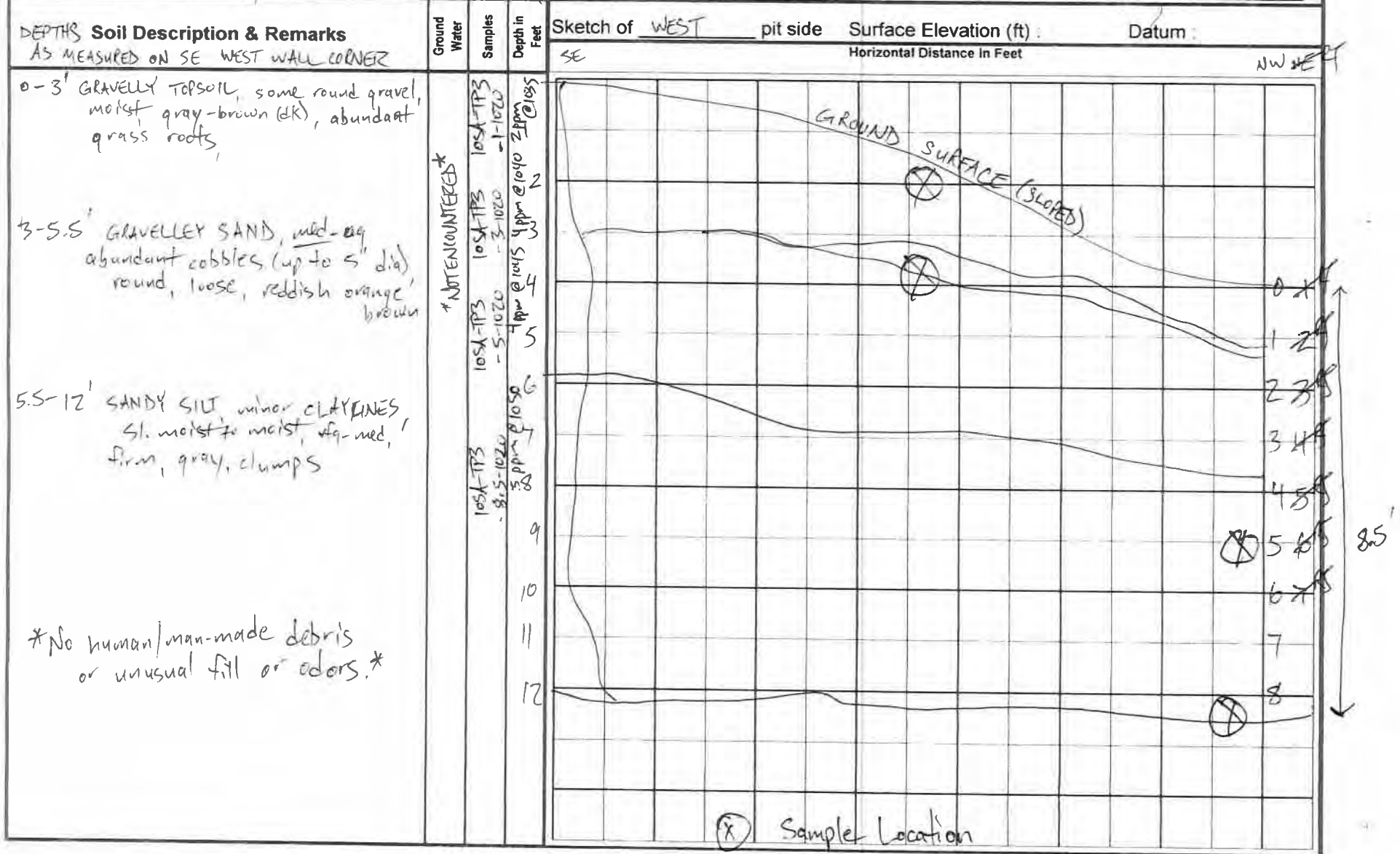
Project: IOSA Inspector: R. Jones Contractor: POFH Operator: Kyle Gropp
 Job No.: POFH Date: 10.14.2020 Equipment: Kubota KX040-4
 Location: Jensen's Shipyard Weather: Overcast, 50s°F Checked By: _____ Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of <u>WEST</u> pit side		Surface Elevation (ft):	Datum:
				GROUND SURFACE		Horizontal Distance in Feet	
0-10" Organic-rich sandy topsoil, black, sl. moist = moist, grass roots.		IOSA-TP1 --1-1020 @ 0.850	1				
10"-5' GRAVELLY SAND, round-subround cobbles (up to 3.5" size), brown, reddish-brown, trace-minor roots		IOSA-TP1 --3-1020 @ 0.855	2				
		IOSA-TP1 --5-1020 @ 0.865	3				
		IOSA-TP1 --7-1020 @ 0.875	4				
CLAYEY, SANDY SILT 5-7-7.5' SILTY CLAY, non-plastic Jan-gray, friable w/ pressure; gray sl. moist = moist, some fine-med SAND *Not a distinct/clean interface* med sand,		IOSA-TP1 --5-1020 @ 0.865	5				
		IOSA-TP1 --7-1020 @ 0.850	6				
		IOSA-TP1 --7-1020 @ 0.850	7				
No man-made debris or fill observed. No garbage or metal debris.		IOSA-TP1 --7-1020 @ 0.850	7.5				

Project: <u>IOSA</u>	Inspector: <u>R. Jones</u>	Contractor: <u>POFH</u>	Operator: <u>Kyle Garopp</u>
Job No.: <u>POFH</u>	Date: <u>10.19.2020</u>	Equipment: <u>Kubota KX040-4</u>	
Location: <u>Jensen's Shipyard</u>	Weather: <u>Overcast, 50s°F, no to little wind</u>	Checked By: _____	Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of <u>WEST</u> pit side	Surface Elevation (ft):	Datum:
				Horizontal Distance in Feet		
0-1' Topsoil, organic-rich, black, sl. moist-moist Abundant GRASS roots		IOSA-TP2	0-1-1020 @ 0.25' depth			
1-3/3.5' GRAVELLY SAND, up to 3/6" cobbles, fg-med. grains, reddish orange/brown minor trace roots		IOSA-TP2	1-3-1020 @ 0.25' depth			
3.5-8' CLAYEY, SANDY SILT, hard, non-plastic, sl. moist to moist, fawnish gray clumps		IOSA-TP2	3-5-1020 @ 0.25' depth			
		IOSA-TP2	5-6-1020 @ 0.25' depth			
		IOSA-TP2	6-8-1020 @ 0.25' depth			

Project: TOSA Inspector: R. Jones Contractor: POFH Operator: Kyle Gropp
 Job No.: POFH Date: 10.19.2020 Equipment: Kubota KY040-4
 Location: Jensen's Shipyard Weather: Mostly Sunny, 50°F, Mild breeze Checked By: _____ Date: _____



Project: IOSA Inspector: R. Jones Contractor: POFH Operator: Kyle Grepp
 Job No.: POFH Date: 10.19.2020 Equipment: Kubota KX040-4
 Location: Jensen's Shipyard Weather: Overcast, 50°F Checked By: _____ Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of <u>EAST</u> pit side	Surface Elevation (ft):	Datum:
0-12" TOPSOIL, roots, brown to dk brown, organic-rich, variable thickness 12"-3 to 4' GRAVELLY SAND, fg-med reddish brown, rounded cobbles, sl. moist-moist 3/4'-9' SANDY SILT, minor clay fines, moist, tan brown w/gray, fg-med, firm but friable *No observed man-made buried debris, no water unusual soils or odors.*		*Not encountered,* 10SA-TP4 01120 10SA-TP4 01115 10SA-TP4 01110 -1-1020 10SA-TP4 01120 10SA-TP4 01115 10SA-TP4 01110 -3-1020 10SA-TP4 01120 10SA-TP4 01115 10SA-TP4 01110 -5-1020 10SA-TP4 01120 10SA-TP4 01115 10SA-TP4 01110 -9-1020	0 ppm 0 ppm 0 ppm 0 ppm 0 ppm 0 ppm 0 ppm 0 ppm	Sketch of <u>EAST</u> pit side Horizontal Distance in Feet 1 2 3 4 5 6 7 8 SLIGHTLY SLOPED GROUND SURFACE		

Project: IOSA Inspector: R. Jones Contractor: POFH Operator: Kyle/Erk
 Job No.: POFH Date: 10.19.2020 Equipment: Kubota KY0404 ~~RT~~ KY040-4
 Location: Jensen's Harbor/Shipyard Weather: Overcast, 50s°F, Minor to Some Breeze Checked By: _____ Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of _____ pit side Surface Elevation (ft) : _____ Datum _____
0-6" some organic-rich soils, sand topsoil, abundant roots roots, moist brown to dk brown ~6" to ~3.5' Mixed GRAVEL and SAND, Disturbed SOILS/FILL, med. brown, sl. moist cobbles *Some plastic sheeting 3.5 to 4.5/5' GRAVELLY SAND, dry cobbles reddish/orangish-brown, med.-eq. w/ some metal debris @ 4.5-5' most METAL debris car door? rebar, misc. sheet metal, all rusted Also some melted glassy slag material 5-7.5' Mixed GRAVELLY SAND, cobbles with SILT debris (clumps), sl. moist to moist, dk red-brown *Some wood/rocks/metal debris @ 7.5-8' SANDY SILT moist undisturbed hard, brown, vfy-med no clay fines	*Not Encountered	IOSA-TPS -1-1020 @ 1135 @ 11ppm IOSA-TPS -3-1020 @ 1245 @ 12ppm IOSA-TPS -5-51 @ 1250 @ 11ppm IOSA-TPS -8-1020 @ 1250 @ 11ppm	0 1 2 3 4 5 6 7 8	Horizontal Distance In Feet NW 1 2 3 4 5 6 7 8 SE GROUND SURFACE Plastic Debris GRAVEL & SAND, sl. moist brown DRY GRAVELLY SAND (FILL), reddish brown WOOD/ROOTS Mixed SILT/SAND/GRAVEL Metal Debris Door (boat fuel tank) undisturbed SILT (X) Sample Location

Project: IOSA Inspector: R. Jones Contractor: POFH Operator: Winter
Job No.: POFH Date: 10.19.2020 Equipment: Kubota KX040-4
Location: Tensen's Shipyard Weather: Overcast, 50s°F, breezy, Cool Checked By: _____ Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of East pit side	Surface Elevation (ft) : SLOPING	Datum :
				Horizontal Distance in Feet		
0 to 1.5/2' SANDY TOPSOIL, organic-rich, dk brown med-e.g. sl. moist = moist, rooty minor gravel * Most manmade debris buried in upper 2-2.5' BGS. * * Observed: electrical box & conduit (abandoned) aluminium trim, rope, mesh sock, * On ground surface: wood, pallet debris, propane/gas canister, plywood, rubber or plastic tubing, boat ball * 2-3' Transition Zone. Mixed SAND/Topsoil, some COBBLES, med. tan-brown Abundant TREE ROOTS ~3 to 7.5' SANDY SILT, some CLAY content, moist, tan to gray, fq-med, no gravel, no roots, no debris, seemingly undisturbed non-plastic, blocky cleavage	* Not encountered.	10SA-TR6 -1-1020 @ 1130 10SA-TR6 -3-1020 @ 1135 10SA-TR6 -5-1020 @ 1140 10SA-TR6 -7-1020 @ 1145 10SA-TR6 -9-1020 @ 1150 10SA-TR6 -11-1020 @ 1155 10SA-TR6 -13-1020 @ 1200 10SA-TR6 -15-1020 @ 1205	1 2 3 4 5 6 7 8		GROUND SURFACE SLOPING NORTH	
				⊗ Sample Location		

Project: IOSA Inspector: R. Jones Contractor: POFH Operator: Winter
Job No.: Port of Friday Harbor Date: 10.19.2020 Equipment: Kubota KX040-4
Location: Jensen's Shipyard Weather: Overcast, low 50s°F, some wind (10 mph) Checked By: _____ Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of <u>WEST</u> pit side		Surface Elevation (ft):	Datum:
				NORTH	SOUTH	Horizontal Distance in Feet	
GRASS @ SURFACE, dense 0-2' Mixed SANDY TOPSOIL, some gravel (rounded up to 2-3") med - c.g. moist dk brown organics Beyond 2' abundant roots Trace organics, minor roots ~2-4' Mixed sand & SILT, not a clean SANDY SILT interface, trace cementation ~3-7' SANDY SILT, tan to gray, moist, med hard clumps, med-hard clumps, trace pockets of cementation	* Not encountered	IOSA-TP7 -1-1020 @ 1535 IOSA-TP7 -3-1020 @ 1540 IOSA-TP7 -5-1020 @ 1545 IOSA-TP7 -7-1020 @ 1550	1 2 3 4 5 6 7				
* No manmade debris outside of the buried 4 inch pipe at ~2-ft BGIS.* Appear to be outside of the former dumping area.				⊗ Sample Locations			

Project : IOSA Inspector : R. Jones Contractor : POFH Operator : Winter/Kyle
 Job No. : POFH Date : 10.19.2020 Equipment : Kubota KX040-4
 Location : Jensen's Shipyard Weather : Overcast, ~50°F, cool/wet, 0-10 mph Checked By : _____ Date : _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet	Sketch of <u>EAST</u> pit side	Surface Elevation (ft) :	Datum :
				NORTH	Horizontal Distance in Feet	SOUTH
Heavy/dense GLASS @ surface. 0-1 organic-rich TOPSOIL, sandy (med). dk brown to black, moist, abundant grass roots. 1-3' GRAVELLY SAND, rounded gravel (up to 2-3" dia) med-cg, sl. moist to moist, reddish tan to light brown, 75-90% SAND 3-7' SANDY SILT, tan to gray, occ. trace round gravel, sl. moist to moist, firm to hard trace cementation in pockets trace clay fines @ 6' erratic boulder (igneous texture) *No observed buried manmade debris.* *No indications of gross/bulk contamination.*		*Not Encountered* IOSA-TP8 1-1020 @ 1025 1 ppm IOSA-TP8 0110 @ 0201 2-3-1020 @ 1145 2 ppm IOSA-TP8 0110 @ 0201 3-5-1020 @ 1145 3 ppm IOSA-TP8 0110 @ 0201 4-5-1020 @ 1145 4 ppm IOSA-TP8 0110 @ 0201 5-7-1020 @ 1145 5 ppm IOSA-TP8 0110 @ 0201 6-7-1020 @ 1145 6 ppm				