

Lower Duwamish Waterway Group

Port of Seattle / City of Seattle / King County / The Boeing Company

WATERWAY USER SURVEY AND ASSESSMENT OF IN-WATER STRUCTURES— DATA REPORT

Prepared for:

**U.S. Environmental Protection Agency
Region 10**

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ACRONYMS AND ABBREVIATIONS

AOC	administrative order on consent
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
GPS	global positioning system
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
RM	river mile
ROD	Record of Decision

1 INTRODUCTION

This report presents the results of the Lower Duwamish Waterway (LDW) user survey and assessment of in-water structures that was performed by the Lower Duwamish Waterway Group (LDWG) in accordance with the third amendment to the administrative order on consent (AOC) (USEPA 2016) and the Waterway User Survey and Assessment of In-Water Structures Work Plan (Integral et al. 2017).

The LDW Feasibility Study (FS) (AECOM 2012) defined recovery categories to facilitate the assignment of remedial technologies to specific areas of the site. The recovery category designations were based on the potential for sediment contaminant concentrations to be reduced through natural recovery, or for subsurface contamination to be exposed as a result of physical processes (i.e., erosion and scour). The defined recovery categories, and the specific criteria upon which they were developed, are presented in Table 23 of the Lower Duwamish Waterway Record of Decision (ROD), titled “Criteria for Assigning Recovery Categories” (USEPA 2014). Based on these categories and other considerations, capping and dredging were assigned to areas with less potential for natural recovery and a higher likelihood of scour or other disturbance. Enhanced natural recovery and monitored natural recovery were assigned to areas where disturbance is less likely and recovery is predicted to occur.

The survey was designed to gather physical information to facilitate an assessment for potential changes to recovery category designations and technology assignments, based on up-to-date waterway use information. It was specifically focused on the collection of data related to physical conditions—one of three lines of evidence considered in the determination of recovery categories in the ROD (USEPA 2014).

The waterway user survey focused on collection of information on current and potential future waterway uses and activities with the potential to disturb the sediment bed to a degree that could alter the projected recovery potential (and recovery category designations) identified in the ROD. Examples of such activities include maneuvering and anchoring of ships and barges, spud use, dragging of bridle chains, and future berth and wharf development and maintenance projects.

Activities that do not represent a substantive risk of disturbance to designated recovery areas (e.g., small recreational vessels operations, tribal fishing, residential dock activity, clamming, and other activities that may result in localized impacts to the sediment bed) were not a focus of the waterway user survey. However, organizations that represent or manage these activities were contacted to verify the nature of their respective current and potential future uses.

The assessment of in-water structures provides an update of geographic information system data and maps provided in the FS related to structures, berthing areas, and property ownership. The information will be used to inform future sampling, remedial design, and/or construction planning.

1.1 ROLES AND RESPONSIBILITIES

Under the oversight of the U.S. Environmental Protection Agency (EPA), LDWG and its consultants performed the survey and assessment in accordance with AOC Third Amendment (USEPA 2016) and the Survey and Assessment Work Plan (Integral et al. 2017). Windward Environmental LLC provided consultant team leadership, project management, and coordination of communication and deliverables between LDWG and EPA. Integral Consulting Inc. led the implementation of the survey and assessment. Moffatt & Nichol led the structures assessment. Convergent Pacific LLC supported the structures assessment, providing global positioning system (GPS) measurements of the accessible in-water structures.

EPA coordinated directly with the Muckleshoot and Suquamish Tribes and the Washington State Department of Ecology (Ecology) regarding the waterway user survey. Ecology, the Tribes, and LDW stakeholders have participated in the review of the work and this report in accordance with the review process established by EPA for the pre-design studies (Windward and Integral 2017).

1.2 TASK SCHEDULE

In-person interviews were conducted between May 20 and December 10, 2017. The assessment of in-water structures was conducted between January 1 and February 28, 2018.

2 WATERWAY USER SURVEY

The waterway user survey was performed without deviation from the Survey and Assessment Work Plan (Integral et al. 2017). This section presents brief summaries of the survey approach and key findings.

2.1 METHODS

The initial step of the waterway user survey involved compilation and review of available waterway ownership and use information from various sources, including the LDW FS, Dredge Material Management Program applications, high-resolution imagery, and King County tax parcel records. In addition, publicly available commercial vessel traffic data obtained from the automatic identification system were assessed to support the identification of vessel operators who frequently transit the LDW. Together, the compiled information was used to develop and categorize the list of waterway users for the purpose of this survey, as presented in the Survey and Assessment Work Plan (Integral et al. 2017) and summarized below:

- **Waterway-Dependent Users:** Users whose operations are more likely to be associated with larger-size vessel traffic and, therefore, have the potential to disturb the sediment bed on a spatial scale that will affect the assigned recovery category or technology assignment. This category includes waterfront property owners and tenants with water-dependent uses that are supported by shoreline infrastructure (e.g., docks, piers, wharves, berthing areas) and operators of commercial tug, barge, and cargo vessels. These users were contacted by phone and/or email to request an in-person interview.
- **Recreational Use Businesses/Associations:** Businesses, associations, or public entities involved in activities that present potential minor, isolated, infrequent, or surficial sediment bed disturbance occurrences (e.g., small-craft recreational user associations). Such businesses or associations were contacted, by phone, to verify the nature of their current activities, identify any planned future changes in activities or shoreline infrastructure, and obtain contact information for potential future coordination during design and construction.
- **Owners of Residential and Waterfront Properties without Water-Dependent Facilities:** All property owners and tenants without apparent water-dependent facilities and those who own residential properties (with or without minor waterfront structures such as docks and piers). Owners in this category were sent a letter inviting them to provide information regarding the current use of their property (e.g., office building, residence) and any information regarding known plans to develop their property in a manner that could result in changes to its waterfront.

EPA coordinated directly with Ecology cleanup site project managers to solicit information about planned cleanup activities that could result in changes to the waterfront or otherwise affect the waterway recovery categories that have been designated near these sites. In addition, EPA coordinated directly with the Tribes to offer an opportunity to provide input regarding their waterway-dependent activities (i.e., fishing).

2.2 TOPICS FOR IN-PERSON INTERVIEWS

Waterway users who participated in interviews were asked to discuss their current and potential future waterway activities. Not all topics and questions applied to each participant; only relevant topics were discussed. An interview form providing all potential discussion topics is included in the Survey and Assessment Work Plan. This form was circulated to potential interviewees in advance of in-person meetings. Completed forms are provided in Appendix A to this report.

The following general topics were discussed during interviews, as applicable:

- General description of the business' waterway-dependent uses
- Any related vessel operations (e.g., berthing, anchoring, transit routes, vessel types, and spudding)
- Facility-specific information regarding waterway structures and related maintenance activities
- Planned future activities.

2.3 OUTREACH

A list of identified waterway users and a summary of the received responses to all survey outreach efforts are provided below and in detail in Tables 1 and 2, and briefly discussed in the following sections.

Survey Response General Summary

Category of Waterway Use	Subject of an Interview	Subject of a Phone Call	No Response	Total	Response Rate (%)
Waterway-Dependent Properties	39	12	11	62	82
Offsite Water-Dependent Users	1	4	5	10	50
Recreational Use Businesses/Associations	1	9	1	11	91
Residential and Waterfront Properties without Water-Dependent Facilities	3 ^a	28 ^a	34	65	na ^a

Notes:

na = not applicable

^a Responses were optional for this category. Several owner's designated representatives offered information in an interview, phone call, or email discussion regarding a separate water-dependent property.

2.3.1 Waterway-Dependent Users

A total of 62 properties adjacent to the LDW were identified as having potential waterway-dependent activities. Twenty-nine individuals representing the owner and/or tenant of 51 of these properties responded to the survey. Of these, 16 individuals (representing 39 properties) participated in an in-person interview with the survey team. The remaining 13 individuals (representing 12 properties) provided information to the survey team through a brief phone call. Nine individuals (representing 11 properties) declined to participate or did not respond to outreach efforts. These 11 properties represent industries associated with seafood processing, concrete materials, diving and salvage, manufacturing and distribution, warehousing, boat repair, and tug and barge operations.

An additional 10 potential waterway-dependent users, based outside the LDW (i.e., vessel operators), were identified through review of automatic identification system information. Of these, one operator participated in an in-person interview and four participated in a brief phone call. The remaining five users declined to participate in the interview or did not respond to outreach efforts and represent businesses associated with tug and barge operations and boat tours.

A summary of the subject properties and offsite users is provided in Table 1. Records of the in-person interviews and phone calls are included in Appendix A to this report.

2.3.2 Recreational Use Businesses/Associations

Eleven properties (Table 1) associated with businesses or other entities involved in recreational activities were contacted by phone to verify the nature of their activities and obtain contact information for potential future coordination during design and construction.

The Work Plan had preliminarily identified South Park Marina in this category of waterway users. At South Park Marina's request, this business was reclassified for the purpose of this survey as a waterway-dependent user.

Summaries of the outreach to these businesses and associations are provided in Table 2. Records of the in-person interviews and phone calls are included in Appendix A to this report.

2.3.3 Owners of Residential and Waterfront Properties without Water-Dependent Facilities

Owners of 65 properties were sent a letter as described above (Section 2.1). This category included the Boeing Company, the City of Seattle, the Port of Seattle, and South Park Marina, each of which confirmed that its respective properties on this list do not have waterway dependent uses.

One business, American Life Insurance, responded to the letter to confirm that its property did not have access to the waterway and thus was not associated with any waterway-dependent activities.

The Washington Department of Transportation responded to the letter, and a phone interview was held to discuss its operation and maintenance of the 1st Avenue South Bridge near river mile (RM) 2.1.

The results of the outreach to owners of residential and waterfront properties without water-dependent uses are summarized in Table 2.

2.3.4 EPA and Ecology Project Managers

EPA's project manager for this survey coordinated with other EPA project managers for other cleanup sites. A summary of information regarding shoreline-related remediation activities was provided for the following sites (Appendix A):

- Boeing Plant 2 Early Action Area
- Terminal 117 Early Action Area

- Jorgensen Forge Early Action Area
- Former Rhone-Poulenc Site.

EPA additionally coordinated with Ecology cleanup site project managers, who provided contact information for parties associated with state cleanup sites. This information was used to perform outreach for the waterway user survey and will be confidentially maintained in Integral's project file.

2.4 SUMMARY OF FINDINGS

As summarized in this section, information gathered during the in-person interviews provided relevant data and observations about various LDW waterway uses, operations, and conditions. This information will inform the assessment of recovery categories and remedial design and construction planning. An overview of this information is provided on Figure 1.

Vessel Types

Interviewees' business operations included marina operations, tugboat services, marine construction, marine transport (primarily to Alaska), cement/concrete manufacturing, steel production, and scrap metal recycling. Marine construction companies conduct most of their work outside of the LDW and use locations in the LDW for berthing of vessels, minor topside repairs, outfitting of barges for specific jobs, and loading/unloading of construction equipment and materials.

Of the businesses that elected to participate in the waterway user survey, many rely on the use of barges and tugboats in the LDW. Barge types include derrick (crane) barges, deck barges (for containers and break bulk), rail barges, and sand/gravel barges. Handymax vessels (large, enclosed bulk carrier vessels) deliver materials for cement manufacturing. Most barges entering the LDW carry limestone, aggregate, sand, slag, and scrap metal, or return construction equipment and empty containers to certain locations. Barges exiting the LDW primarily carry containers, break bulk, and construction equipment/materials. South Park Marina provides berthing for personal watercraft (mostly sailboats).

Berthing Locations

Interviewees identified overwater structures and berthing areas used, which was largely consistent with the information compiled and mapped for the LDW FS (Figure 1). Several interviewees identified berthing areas and structures that were no longer used as such. For example, a barge that had been permanently moored at RM 2.9W (and was identified as an overwater structure with an associated berthing area in the FS) had subsequently been

removed, and an interviewee identified this location as no longer containing a berthing area or an overwater structure.

Conversely, previously unmapped berthing areas around Kellogg Island were identified by the Port of Seattle and Manson Construction, and a few other additional berthing areas were identified by interviewees. Noted differences in previously mapped berthing areas and overwater structures are shown on Figure 1.

Use of Spuds

Most interviewees noted that their vessels are not secured with spuds, but are instead tied to structures. Exceptions occur with derrick (crane) barges secured along the eastern side of Kellogg Island and in areas where derrick barges are kept at lay berth.¹ The piles along the east side of Kellogg Island are located in areas too shallow to float barges; therefore, derrick barges are secured with spuds in this area, and other barges are rafted to those secured with spuds.

An interviewee noted that securing derrick barges with spuds is a more secure method than tying barges to an unattended structure (e.g., mooring dolphin). Where possible, the interviewee's business prefers to use this method for barges stored in leased locations, remote from the company's main facility.

Seasonal Variation

Through multiple interviews, it was noted that a major commercial enterprise in the LDW is shipping to Alaska. There are three major shipping regions, and each is affected by the seasons differently:

- Southeast Alaska (e.g., Ketchikan, Juneau)—year-round sailing with little seasonal variation
- Central Alaska (e.g., Anchorage, Fairbanks)—year-round sailing with increased activity in the summer; affected by construction business in Alaska, which slows down in the winter
- Western Alaska (e.g., Dutch Harbor, Nome)—March to September sailing.

More shipping-related trips in and out of the LDW occur in the summer months. However, the winter periods can have a greater number of vessels lying at berth, where minor repairs can take place. Some shipping to Alaska is also affected by fishing seasons, but this is more of a

¹ A lay berth is a location where a vessel is stored but not loaded/unloaded or accessed in any other way. A lay berth may be inaccessible from land, and thus is simply a place where a vessel is stored when not in use. Pilots and staff access a vessel at a lay berth by way of another vessel. Barges at lay berths will most often be stored empty.

specialty market. Some interviewees noted that shipping to Hawaii (on existing and/or future planned routes) allows additional barges to be out on shipments during the winter.

Users who conduct marine construction projects are affected by in-water construction closures (fish windows), and thus will be busier (and have vessels out of the LDW on construction jobs) in the winter. These companies endeavor to have vessels out on jobs as often as possible, and not lying at berth in the LDW. Recreational vessel use is heaviest during warmer weather with some seasonal activity in the winter for holiday-related events.

Sedimentation and Tidal Constraints

Some interviewees noted tidal constraints at some of their berthing areas or in portions of their berthing areas. Specific locations are noted in Figure 1. Strategies to deal with tidal constraints include short loading barges (to reduce draft) and timing activities at a particular location in accordance with tidal predictions. Vessels awaiting a suitable time to enter the LDW or needing to be lightened (removing some materials from one vessel to another to adjust weight/draft of the first vessel) are commonly moored at the marine exchange buoy in Elliott Bay.

Some interviewees also noted observed sedimentation in or near their berthing areas and the need to maintain suitable navigation depths. Interviewees in the RM 2.3 to 2.7 W area (just downstream of Slip 4) noted shoaling in the navigation channel and emphasized the need to maintain the authorized depth in the channel. In addition, the ability to dredge berthing areas for maintenance purposes and to repair structures (including removal of creosote-treated timbers) was identified as essential for business purposes. Shoaling was also noted as a concern in areas where shallow waters can cause debris to become trapped under and around overwater structures.

General Vessel Traffic Conditions

Multiple interviewees expressed a desire to maintain the LDW as a working waterway. A desire for a sufficient number of berthing spaces with adequate depth was expressed, noting an overall shortage of commercial berthing spaces in Puget Sound. Some interviewees utilize berthing areas/buoys in other parts of Puget Sound due to a shortage of space in the LDW. LDW waterway users lease berthing spaces from one another to store vessels. Many berths are lay berths, used simply to store a vessel but not to load or perform work. These lay berths may be piles or structures that are primarily accessed from the water (lacking an upland access point).

While some interviewees expressed support for recreational uses of the LDW, others noted that personal watercraft (including self-propelled craft such as kayaks) in close proximity to heavy equipment can pose safety hazards. Recreational users in search of shoreline access points can

sometimes result in users traversing through/near industrial yards where a trail might be expected but is not present.

Habitat Areas

The following existing and planned habitat protection/restoration areas were identified by multiple interviewees:

- Port of Seattle Terminal 105 (existing)
- Port of Seattle Terminals 115, 117 (planned)
- Eighth Avenue Public Access (existing)
- Slip 4 Early Action Area (existing)
- Plant 2 Early Action Area (existing)
- Turning Basin #3 (existing).

3 ASSESSMENT OF IN-WATER STRUCTURES

The reconnaissance-level assessment of LDW shoreline and in-water structures was conducted in accordance with the Survey and Assessment Work Plan (Integral et al. 2017). The objective of the in-water assessment was to collect data to supplement the waterway user surveys, update information presented in the FS (AECOM 2012), support the assessment of recovery categories (Task 9 in AOC Third Amendment Statement of Work), and identify locations where structural or access restrictions may influence future sampling activities and remedial construction activities.

3.1 METHODS

The assessment of in-water structures was performed without deviation from the Survey and Assessment Work Plan (Integral et al. 2017). This section presents a brief overview of the survey approach.

3.1.1 In-Water Structures Assessment

The in-water assessment was conducted using a small-craft vessel operated by a three- or four-person crew. Field equipment included a GPS device, cameras, measuring tape, a laptop computer, cellular phones, and appropriate water safety and boating gear.

To facilitate the assessment, each structure was assigned a two-digit identification number. The numbers range from 01 through 66. The two-digit structure number is used throughout this report, the assessment forms, photograph numbers, and other associated documents and notes. A structure number identification map is included at the beginning of Appendix B to allow cross reference of structures to the completed assessment forms.

3.1.2 GPS Measurements

The horizontal coordinates of accessible corners and/or outer edges of waterway structures were recorded using a GPS device with an accuracy of ± 0.5 ft. To the extent practicable, this included capturing individual locations, or corners, of existing dolphins or pile fields that are not associated with a particular facility. These coordinates (Appendix C) were used to identify significant changes relative to conditions presented in the FS, as discussed in Section 3.3 and noted on Figure 1.

3.2 FIELD SUMMARY

The in-water assessment was conducted sequentially by progressing upstream along the east shoreline and then upstream along the west shoreline. This maximized efficiency and reduced unnecessary crossings of the navigation channel. All observations were made from a safe working distance, and the crew avoided interrupting facility operations.

The field team completed an in-water structures assessment form and took photographs of each in-water structure. The assessment form consists of four sections:

- General facility information—Information such as structure type(s), river mile and side, owner/operator, assessment date and time, and assessment personnel. Dolphins and pile fields that are not associated with a particular facility are identified accordingly in this section.
- Structural description and access restrictions—Description of the structure’s construction type, general condition, location, and potential construction or sampling access constraints (such as approximate under-pier clearance). The description provides visual assessment of general bank slope, steepness, slope condition (e.g., riprap or soft sediment accumulation), amount of debris, evidence of scour/erosion, etc.
- Structure vicinity map—Aerial photograph of the structure vicinity to identify locations of photographs and other relevant facility data.
- Photo log—Photographs taken during the in-water assessment process, where permitted by the property owner, including shots of accessible structure faces (north, south, east, and west), upstream and downstream views of the channel, typical shoreline conditions, and potential access constraints for future remedial design sampling and construction. Each log entry includes the photo element, photo number, direction toward which the photo is taken, and brief photo description.

The use of each structure for potential berthing activities was estimated based on visual observations. According to the field team’s observations, structures were assigned one of the following descriptions: Operational, Not Operational, or Unknown Operational Status. The following describes the basis for these descriptions:

- Operational: Structures observed to have vessels at berth or structures identified as being operational during the waterway user survey.
- Not Operational: Structures with no observed in-water activity, structures without berthing capabilities, or structures identified as not operational during the waterway user survey.
- Unknown Operational Status: Structures that did not fit the guidance provided in the previous two categories.

In addition to the in-water structures, the team noted locations of and photographed readily visible tribal fish net attachment points between RM 0.0 and 5.0. The fish net attachment points were visually located by observing the small white placards printed with the identification number.

The completed assessment forms for each structure are presented in Appendix B.

3.3 SUMMARY OF FINDINGS

The following in-water structure types were recorded, where accessible, as part of the assessment:

- Wharves, piers, docks, and other over-water structures
- Piles and dolphins associated with and not associated with over-water structures
- Bulkheads and riprapped or engineered shorelines
- Large outfalls (typically >36 inches) with engineered aprons, wing walls, or similar appurtenances, where accessible and observable given the tides.

A summary of the observed in-water and over-water structures is provided in Table 3. Table 3 is based on Table 2-10 from the FS and includes the structure number, structure name, RM, river side, description, use, berthing operational status, and tax parcel identification. Table 2-10 from the FS included 58 pre-identified structures and the understanding of the structure type and use at the time. As part of the in-water assessment survey, updates were made to this table and any additional observed structures were incorporated. Based on this in-water assessment, eight structures and in-water features were added to this list for a total of 66 structures, 43 of which were observed to provide operational berthing facilities. Of the 58 previously listed structures, three underwater or overhead utilities were not located as they were outside the focus of this assessment. These structures (included in Table 3) are the following:

- Overhead power lines at approximately RM 3.6 (Structure Number 49)
- Submerged cable at approximately RM 2.85 to 3.0 (Structure Number 55)
- Submerged cable at approximately RM 3.15 to 3.4 (Structure Number 56).

The completed structure assessment forms (Appendix B) are the compilation of observations and photographs taken during the visual survey for each in-water structure.

The shoreline conditions between documented structures were also noted and documented with photographs and a photograph log. Recorded information includes the extent of protected or unprotected shorelines, and the location of other features such as outfalls, piles, and

dolphins. The photographs, photograph descriptions, and a photograph identification map are included after the structure assessment forms in Appendix B.

The majority of the structures observed for this assessment were consistent with the information presented in the FS, with the following notable exceptions:

- Removal of a portion of the Structure Number 36 wharf within Slip 4 at approximately RM 2.85 on the east side of the waterway
- Replacement of the South Park Bridge crossing the waterway at approximately RM 3.3 (Structure Number 57)
- Remediation of the east shoreline between RM 2.85 and RM 3.0
- Removal of dolphins between RM 3.0 and 3.2 along the east shoreline in the vicinity of the Boeing facility (Structure Number 38)
- Removal of the over-water structure along the east shoreline between RM 3.3 and 3.5.

The in-water survey was conducted in the winter when daytime water levels ranged between approximately +5 and +12 ft mean lower low water. While it is expected that some shoreline features and underdeck elements, such as outfalls, bracing, and utility pipes, were not visible due to the water levels, the overall objectives of the in-water assessment were accomplished. Additional detailed surveys of specific structures will be completed, as needed, during remedial design.

4 NEXT STEPS

The data yielded by the survey and assessment will be reviewed and evaluated for relevance to the “physical conditions” criterion that was used in the LDW FS to establish recovery category areas. Specifically, these data will be used to support the identification of areas potentially subject to scour or other disturbances based on current vessel movement patterns and berthing operations. These potential scour areas will then be overlaid on the recovery category map (Figure 12 of the ROD [USEPA 2014]) to assess where adjustment may be needed, and to help identify location-specific investigations or analyses that may be needed during design. This evaluation will be performed under Task 9 of the Third Amendment Statement of Work and the results presented in the recovery category recommendations report. This report will identify and provide recommendations for filling data gaps to finalize recovery category assignments during remedial design.

The findings from the survey and assessment will also serve as a resource for future remedial design and construction planning tasks. Contact information for waterway users, collected in accordance with the Privacy Act of 1974 (5 U.S.C. § 552a), will be confidentially maintained in Integral’s project file for future potential coordination activities. Waterway users and stakeholders who did not participate in the survey will continue to have the opportunity to provide input throughout the remedial design process. Additional surveys of waterway structures (e.g., submerged utilities that were not a focus of this study) will be performed to capture finer resolution of information, as needed, during remedial design.

5 REFERENCES

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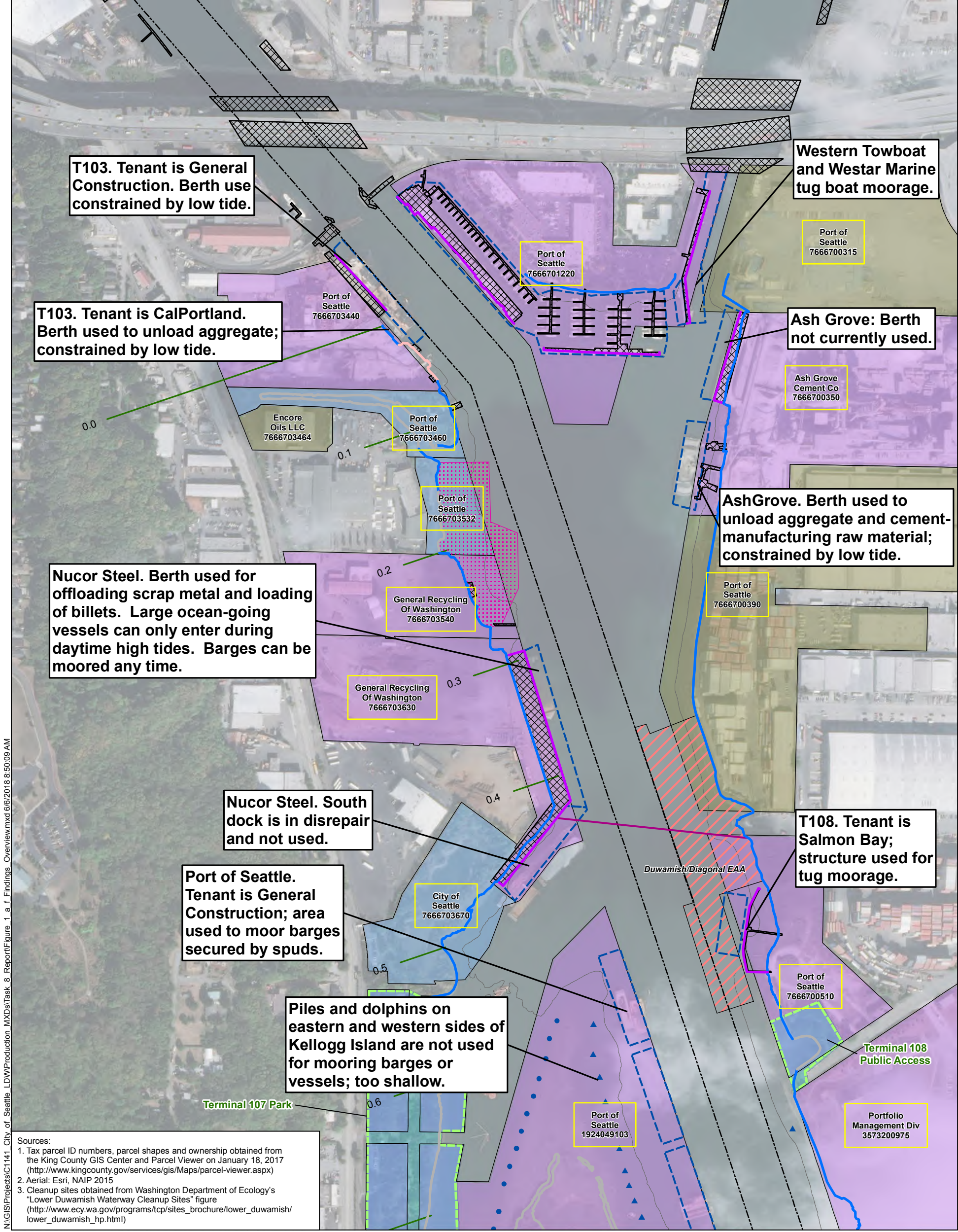
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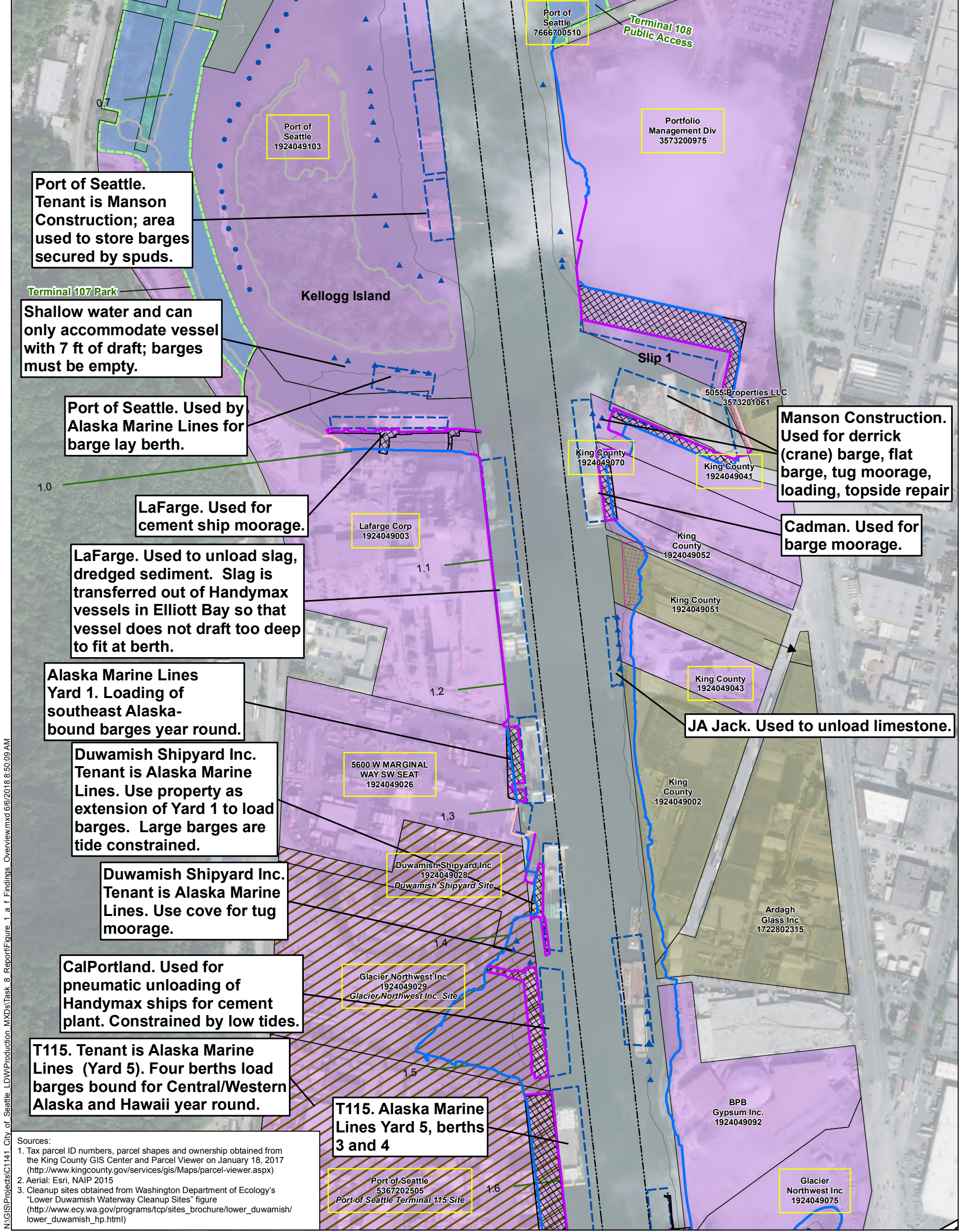
Windward and Integral. 2017. Pre-design Studies Work Plan. Prepared for Lower Duwamish Waterway Group. Windward Environmental LLC, Seattle, WA; and Integral Consulting Inc., Seattle, WA. August.

FIGURES



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Figure 1a.
Overview of Waterway User Survey and Structures Assessment Findings



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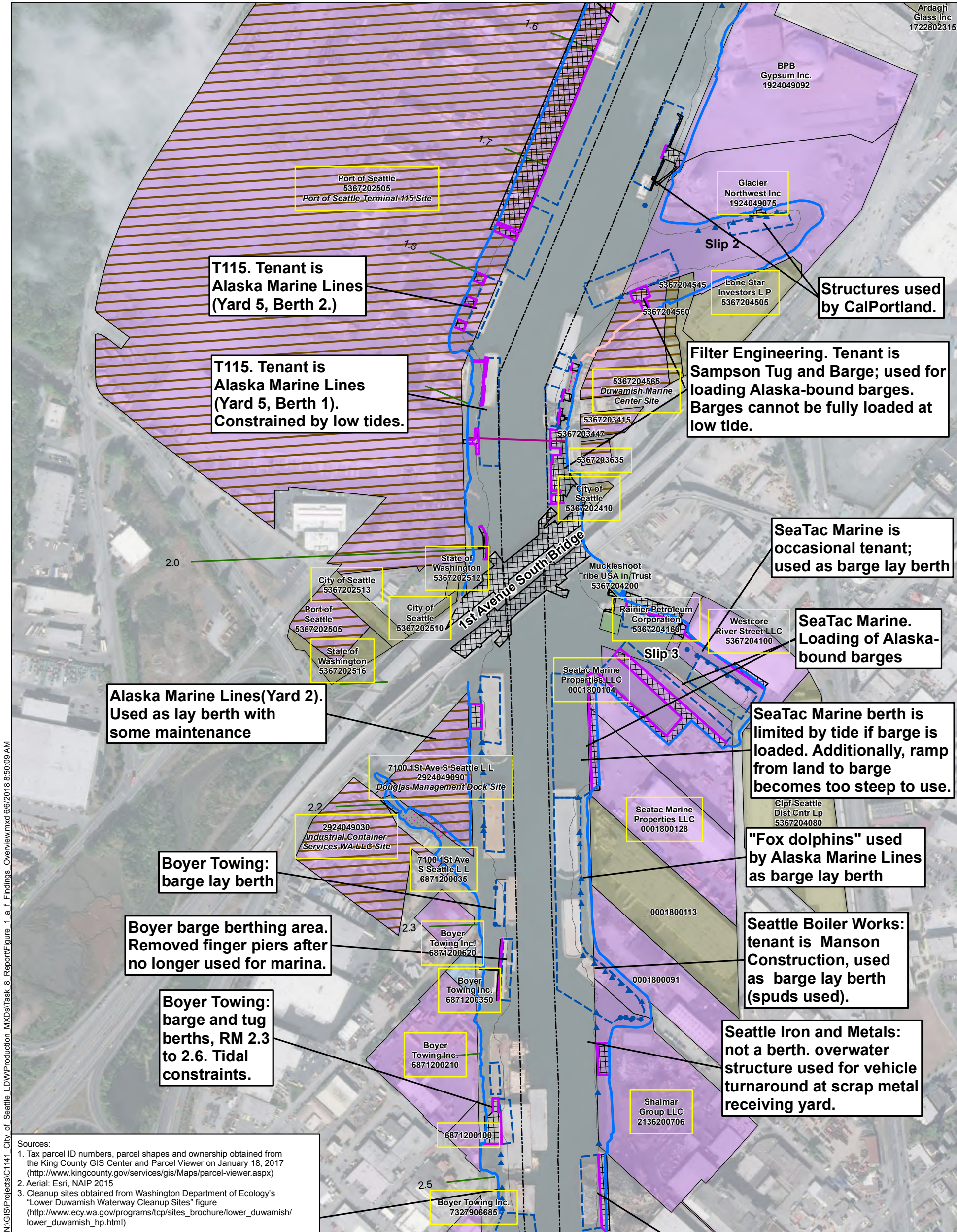
Sources:
 1. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (<http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx>)
 2. Aerial: Esri, NAIP 2015
 3. Cleanup sites obtained from Washington Department of Ecology's "Lower Duwamish Waterway Cleanup Sites" figure (http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html)

Notes:
 1. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.
 2. Berthing areas, as illustrated on this figure, are approximate and based on interviews with waterway users and observations made during the assessment of in-water structures.
 3. EAA = Early Action Area
 4. The facility operational annotations presented herein are provided only for selected users that participated in the survey. Refer to Appendix A user interview forms for additional details.
 5. The facility operational information presented herein is based on interviews with facility operators and has not been independently verified.
 6. See Figure B-1 for further details and photos of structures and shoreline.
 7. Parcel IDs and names outline in yellow indicate a response to the survey. See Tables 1 and 2.

Property Use	OverWaterStructure	Shoreline Structure
Waterway-Dependent Users	Underwater Utility	Armored Slope
Recreational Use Businesses/Associations	Navigation Channel	Vertical Bulkhead
Residential and Waterfront Properties without Water-Dependent Facilities	River Mile Marker	Exposed Bank
Tribal Users	Pile	Dock Face
Washington Department of Ecology Cleanup Site	Dolphin	
Federal Cleanup Site	Pile Group	
	Berthing	
	Public Property/Park	

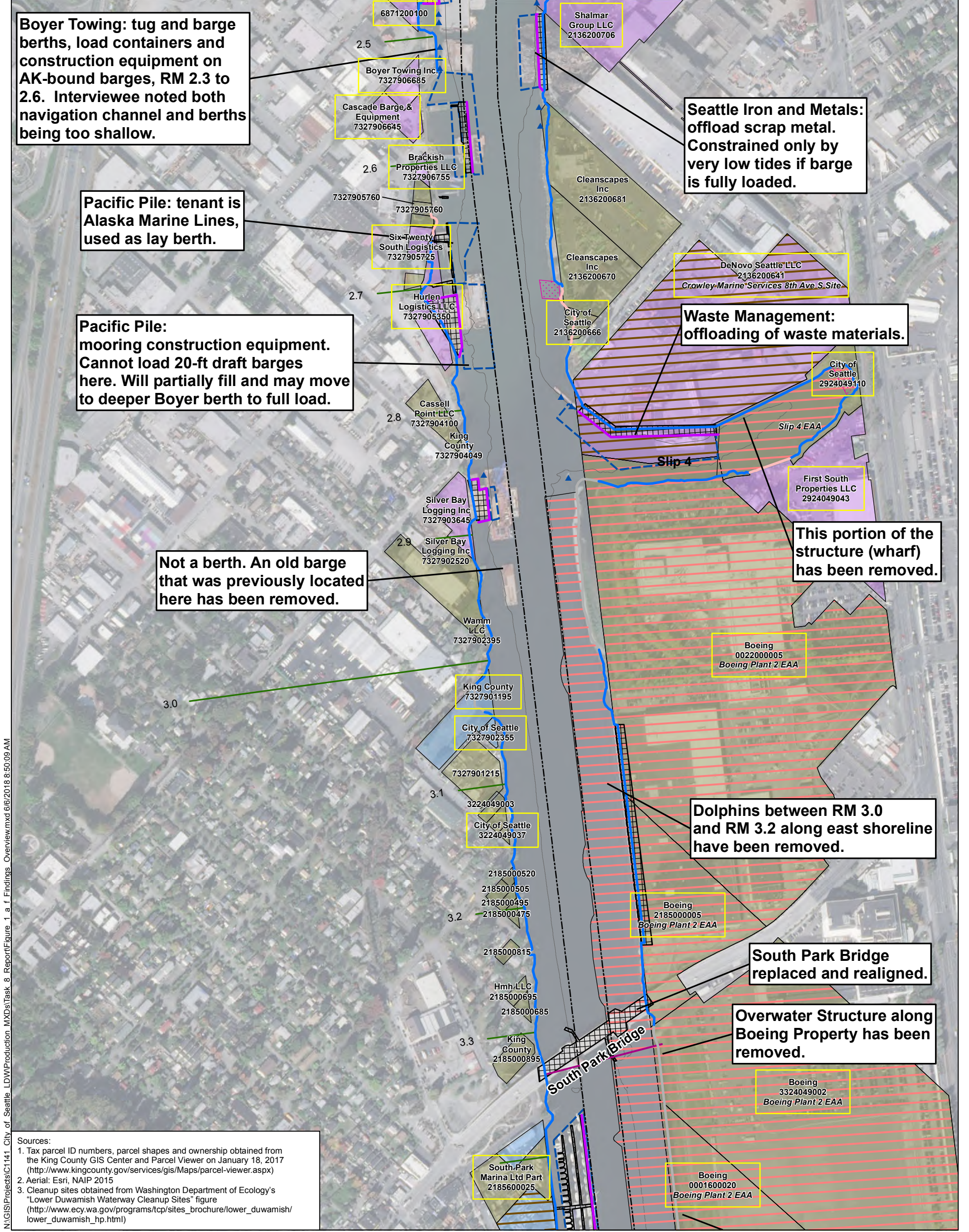
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Figure 1b.
Overview of Waterway User Survey and Structures Assessment Findings



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Figure 1c.
Overview of Waterway User Survey and Structures Assessment Findings



Boyer Towing: tug and barge berths, load containers and construction equipment on AK-bound barges, RM 2.3 to 2.6. Interviewee noted both navigation channel and berths being too shallow.

Pacific Pile: tenant is Alaska Marine Lines, used as lay berth.

Pacific Pile: mooring construction equipment. Cannot load 20-ft draft barges here. Will partially fill and may move to deeper Boyer berth to full load.

Not a berth. An old barge that was previously located here has been removed.

Seattle Iron and Metals: offload scrap metal. Constrained only by very low tides if barge is fully loaded.

Waste Management: offloading of waste materials.

This portion of the structure (wharf) has been removed.

Dolphins between RM 3.0 and RM 3.2 along east shoreline have been removed.

South Park Bridge replaced and realigned.

Overwater Structure along Boeing Property has been removed.

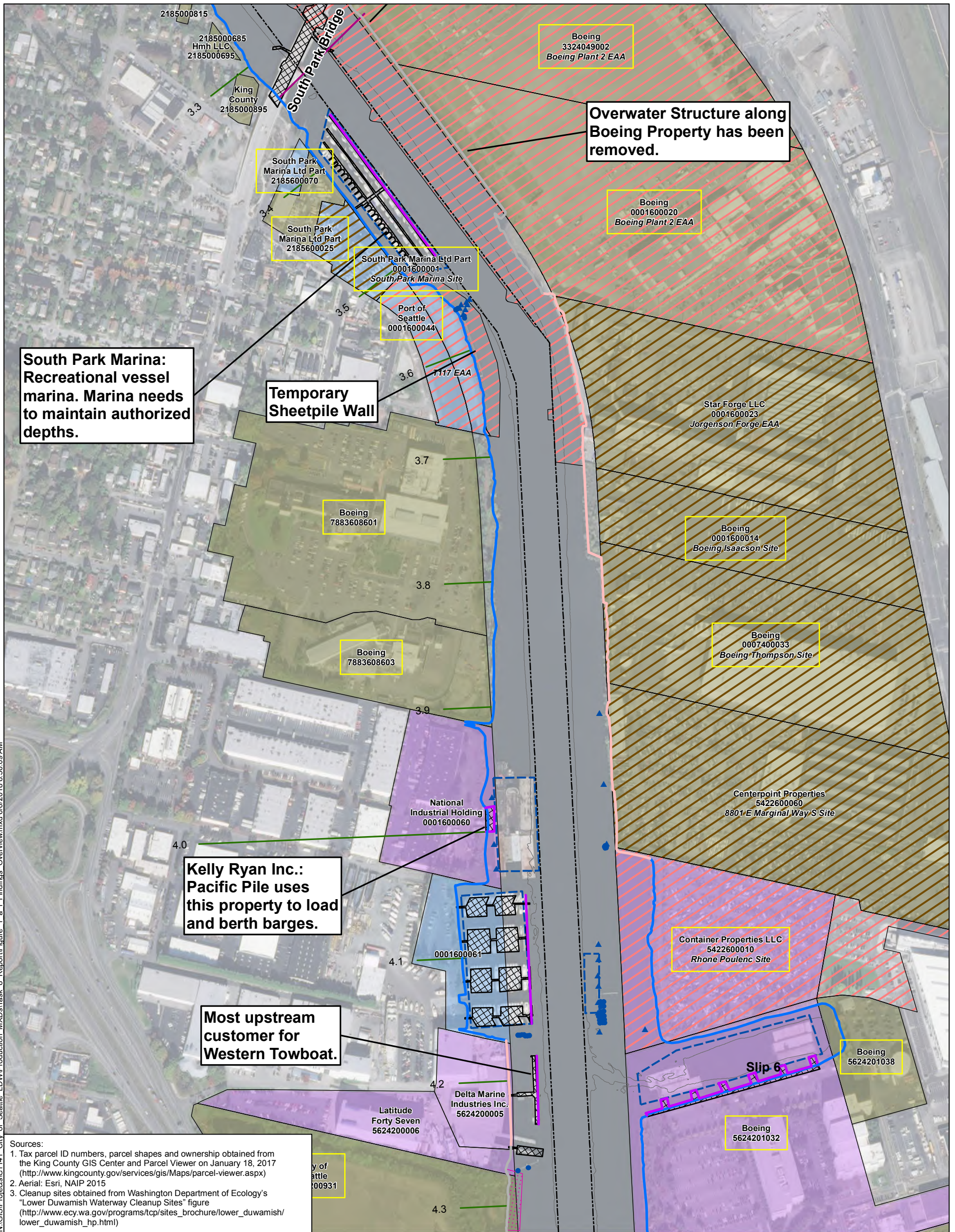
Sources:
 1. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (<http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx>)
 2. Aerial: Esri, NAIP 2015
 3. Cleanup sites obtained from Washington Department of Ecology's "Lower Duwamish Waterway Cleanup Sites" figure (http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html)

Notes:
 1. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.
 2. Berthing areas, as illustrated on this figure, are approximate and based on interviews with waterway users and observations made during the assessment of in-water structures.
 3. EAA = Early Action Area
 4. The facility operational annotations presented herein are provided only for selected users that participated in the survey. Refer to Appendix A user interview forms for additional details.
 5. The facility operational information presented herein is based on interviews with facility operators and has not been independently verified.
 6. See Figure B-1 for further details and photos of structures and shoreline.
 7. Parcel IDs and names outline in yellow indicate a response to the survey. See Tables 1 and 2.

Property Use	OverWaterStructure	Shoreline Structure
Waterway-Dependent Users	Underwater Utility	Armored Slope
Recreational Use Businesses/Associations	Navigation Channel	Vertical Bulkhead
Residential and Waterfront Properties without Water-Dependent Facilities	River Mile Marker	Exposed Bank
Tribal Users	Pile	Dock Face
Washington Department of Ecology Cleanup Site	Dolphin	
Federal Cleanup Site	Pile Group	
	Berthing	
	Public Property/Park	

0 200 400 Feet

Figure 1d.
 Overview of Waterway User Survey and Structures Assessment Findings



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Sources:
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Notes:
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 6. See Figure B-1 for further details and photos of structures and shoreline.
 7. Parcel IDs and names outline in yellow indicate a response to the survey. See Tables 1 and 2.

Property Use		Shoreline Structure	
Waterway-Dependent Users	OverWaterStructure	Armored Slope	Vertical Bulkhead
Recreational Use Businesses/Associations	Navigation Channel	Exposed Bank	Dock Face
Residential and Waterfront Properties without Water-Dependent Facilities	River Mile Marker	Pile	Dolphin
Tribal Users	Pile Group	Berthing	Public Property/Park
Washington Department of Ecology Cleanup Site	Berthing		
Federal Cleanup Site	Public Property/Park		

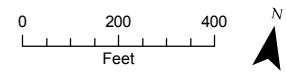
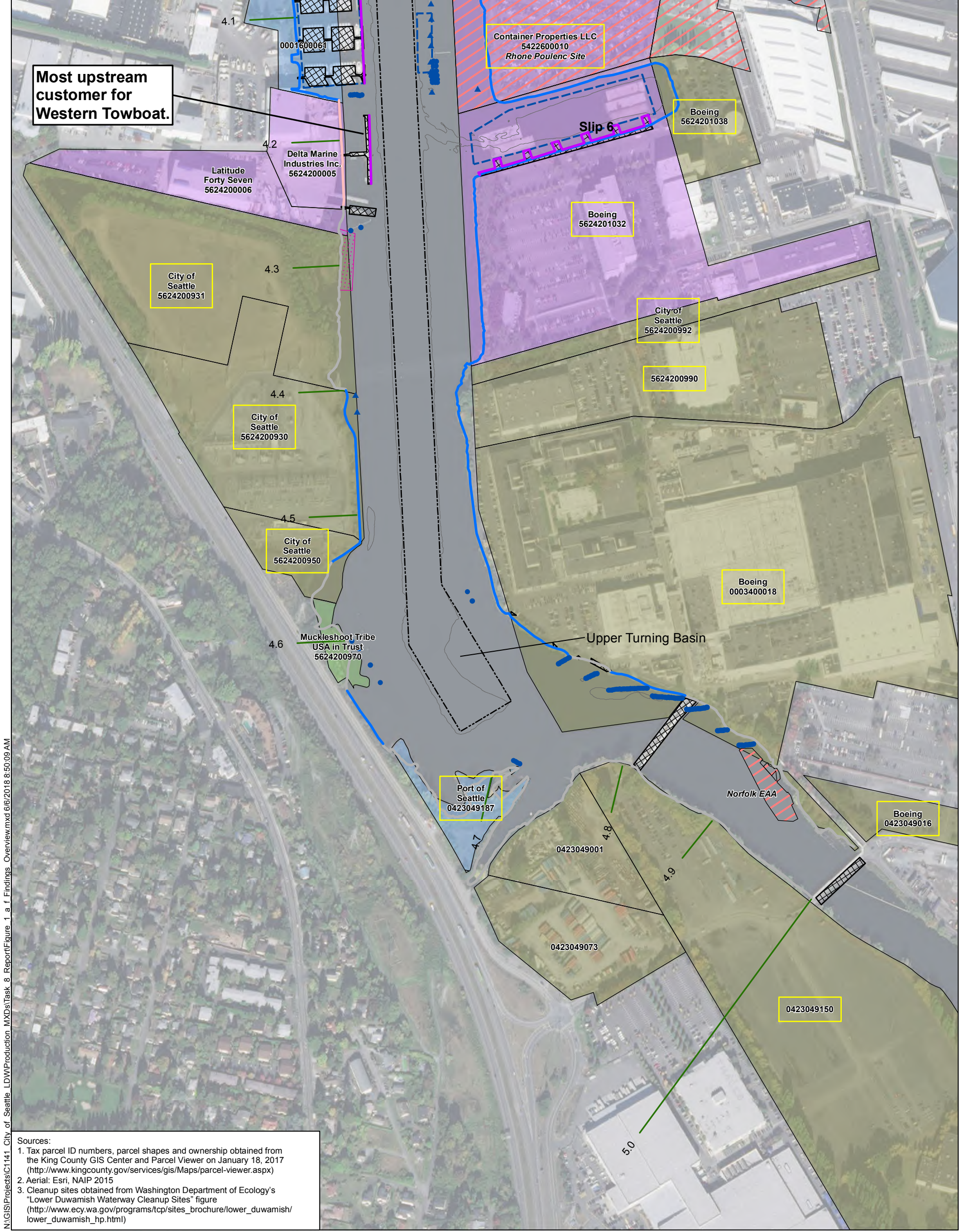


Figure 1e.
 Overview of Waterway User Survey and Structures Assessment Findings



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Sources:
 1. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (<http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx>)
 2. Aerial: Esri, NAIP 2015
 3. Cleanup sites obtained from Washington Department of Ecology's "Lower Duwamish Waterway Cleanup Sites" figure (http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html)

Notes:
 1. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.
 2. Berthing areas, as illustrated on this figure, are approximate and based on interviews with waterway users and observations made during the assessment of in-water structures.
 3. EAA = Early Action Area
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 5. The facility operational information presented herein is based on interviews with facility operators and has not been independently verified.
 6. See Figure B-1 for further details and photos of structures and shoreline.
 7. Parcel IDs and names outline in yellow indicate a response to the survey. See Tables 1 and 2.

Property Use		OverWaterStructure	Shoreline Structure
Waterway-Dependent Users	Recreational Use Businesses/Associations	Underwater Utility	Armored Slope
Residential and Waterfront Properties without Water-Dependent Facilities	Tribal Users	Navigation Channel	Vertical Bulkhead
Washington Department of Ecology Cleanup Site	Federal Cleanup Site	River Mile Marker	Exposed Bank
		Pile	Dock Face
		Dolphin	
		Pile Group	
		Berthing	
		Public Property/Park	

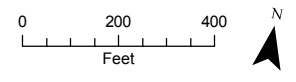


Figure 1f.
 Overview of Waterway User Survey and Structures Assessment Findings

TABLES

Table 1. Survey Response Summary: Water-Dependent Users and Recreational Use Businesses/Associations

Tax Parcel ID#	Approx. River Mile	Owner	Tenant	Responded to Survey?	Interview Form
Properties Adjacent to LDW					
2924049090	2.15 W	7100 1St Ave S Seattle L L	Alaska Marine Lines	Yes	Appendix A - Interview ID: 245
6871200035	2.25 W	7100 1St Ave S Seattle L L	Alaska Marine Lines	Yes	Appendix A - Interview ID: 245
1924049103	0.6–0.9 W	Port of Seattle (Kellogg Island Moorings)	Alaska Marine Lines	Yes ^b	Appendix A - Interview IDs: 126, 245
5367202505	1.5–2.0 W	Port of Seattle (T-115)	Alaska Marine Lines/Aloha Marine Lines	Yes ^b	Appendix A - Interview IDs: 126, 245
1924049026	1.3 W	5600 W Marginal Way SW Seat	Alaska Marine Lines/Northland Services	Yes	Appendix A - Interview ID: 245
7666701220	0 E	Port of Seattle (T-102)	Arrow Launch Service	Yes	Appendix A - Table A1
7666700350	0.2 E	Ash Grove Cement Co	Ash Grove Cement Co.	Yes	Appendix A - Interview ID: 232
5624201032	4.3 E	Boeing	Boeing Developmental Center	Yes	Appendix A - Table A1
6871200210	2.4 W	Boyer Towing Inc.	Boyer Alaska Barge Line	Yes	Appendix A - Interview ID: 241
7327906685	2.55 W	Boyer Towing Inc.	Boyer Towing Inc.	Yes	Appendix A - Interview ID: 241
6871200100	2.45 W	Individual Owner	Boyer Towing Inc.	Yes	Appendix A - Interview ID: 241
6871200620	2.3 W	Boyer Towing Inc.	Boyer Towing Inc.	Yes	Appendix A - Interview ID: 241
2924049043	2.9 E	First South Properties LLC	Cedar Grove Composting, Inc.	Yes	Appendix A - Table A1
1924049092	1.55 E	BPB Gypsum Inc.	Certain Teed Corporation	No	NA
5422600010	4.1 E	Container Properties LLC	Container Properties LLC	Yes	Appendix A - Table A1
0001800128	2.2 E	Seatac Marine Properties LLC	Delta	Yes	Appendix A - Interview ID: 233
5624200005	4.2 W	Delta Marine Industries Inc.	Delta Marine Industries Inc.	No	NA
5624200006	4.25 W	Latitude Forty Seven	Delta Marine Industries Inc.	No	NA
5367203635	1.95 E	Duwamish Marine Center/ Filter Engineering	Duwamish Marine Center/ Filter Engineering/ Samson Tug and Barge	Yes	Appendix A - Interview ID: 243
5367204565	1.8 E	Duwamish Marine Center/ Filter Engineering	Duwamish Marine Center/ Filter Engineering/ Samson Tug and Barge	Yes	Appendix A - Interview ID: 243
1924049028	1.35 W	Duwamish Shipyard Inc.	Duwamish Shipyard Inc.	Yes ^c	Appendix A - Interview ID: 239
3573200975	0.7 E	Portfolio Management Div	Federal Center South	Yes	Appendix A - Table A1
NA	2.1	State of Washington Department of Transportation	First Avenue Bridge	Yes	Appendix A - Interview ID: 244
7666703440	0 W	Port of Seattle (T-103)	General Construction	Yes ^a	Appendix A - Interview ID: 127
1924049103	0.6–0.9 W	Port of Seattle (Kellogg Island Moorings)	General Construction	Yes ^a	Appendix A - Interview ID: 127
0001800104	2.1 E	Seatac Marine Properties LLC	Glacier Marine Services	Yes	Appendix A - Interview ID: 233
7666703440	0 W	Port of Seattle (T-103)	Glacier Northwest Inc./CalPortland	Yes	Appendix A - Interview ID: 236
1924049029	1.45 W	Glacier Northwest Inc.	Glacier Northwest Inc./CalPortland	Yes	Appendix A - Interview ID: 236
1924049075	1.7 E	Glacier Northwest Inc.	Glacier Northwest Inc./CalPortland	Yes	Appendix A - Interview ID: 236
7666701220	0 E	Port of Seattle (T-102)	Global Diving and Salvage	No	NA
5367203415	1.9 E	Individual Owner	Hale's Construction	No	NA
2924049030	2.25 W	Individual Owner	Industrial Container Services	Yes	Appendix A - Table A1
1924049043	1.15 E	King County	J.A. Jack And Sons	Yes	Appendix A - Interview ID: 237
1924049003	1.1 W	Lafarge Corp	Lafarge Corp	Yes	Appendix A - Interview ID: 234
1924049070	1.05 E	King County	Lehigh Cadman	No	NA
1924049052	1.1 E	King County	Lehigh Cadman	No	NA

Table 1. Survey Response Summary: Water-Dependent Users and Recreational Use Businesses/Associations

Tax Parcel ID#	Approx. River Mile	Owner	Tenant	Responded to Survey?	Interview Form
5367202505	1.5–2.0 W	Port of Seattle (T-115)	Lineage Logistics/Sea Freeze	No	NA
1924049041	1.0 E	King County	Manson Construction	Yes	Appendix A - Interview ID: 231
1924049070	1.05 E	King County	Manson Construction	Yes	Appendix A - Interview ID: 231
1924049103	0.6–0.9 W	Port of Seattle (Kellogg Island Moorings)	Manson Construction	Yes ^b	Appendix A - Interview IDs: 127, 231
5367202505	1.5–2.0 W	Port of Seattle (T-115)	Northwest Seafood Processors	No	NA
7666703540	0.25 W	Nucor Steel/ General Recycling Of Washington	Nucor Steel/ General Recycling Of Washington	Yes	Appendix A - Interview ID: 247
7666703630	0.25 W	Nucor Steel/ General Recycling Of Washington	Nucor Steel/ General Recycling Of Washington	Yes	Appendix A - Interview ID: 247
7327905350	2.75 W	Pacific Pile and Marine	Pacific Pile and Marine	Yes	Appendix A - Interview ID: 235
7327906645	2.55 W	Cascade Barge & Equipment	Pacific Pile and Marine	Yes	Appendix A - Interview ID: 235
7327905725	2.65 W	Six Twenty South Logistics	Pacific Pile And Marine	Yes	Appendix A - Interview ID: 235
7327906755	2.6 W	Brackish Properties LLC	Pacific Pile And Marine Machine Shop	Yes	Appendix A - Interview ID: 235
5367204160	2.1 E	Maxim	Rainier Petroleum Corporation	Yes	Appendix A - Table A1
2185600070	3.5–3.7 W	South Park Marina	Ricks Master Marine	Yes	Appendix A - Interview ID: 238
7666700510	0.5–0.7 E	Port of Seattle (T-108W)	Salmon Bay Barge Line, Inc.	Yes ^a	Appendix A - Interview ID: 125
0001600060	3.95 W	National Industrial Holding	Sea King Industrial Park LLC	No	NA
0001800091	2.3 E	Owned by Trust	Seattle Boiler Works	No	NA
2136200706	2.4 E	Shalmar Group LLC	Seattle Iron & Metals	Yes	Appendix A - Interview ID: 246
7327903645	2.9 W	Silver Bay Logging Inc.	Silver Bay Waterfront Site	No ^d	Appendix A - Table A1
0001600001	3.45 W	South Park Marina Ltd Part	South Park Marina	Yes	Appendix A - Interview ID: 238
7666700350	0.2 E	Ash Grove Cement Co	Stoneway Concrete	Yes	Appendix A - Table A1
1924049103	0.6–0.9 W	Port of Seattle (T-107)	Trac Intermodal	Yes	Appendix A - Table A1
2136200641	2.8 E	Crowley Marine Services	Waste Management	Yes ^c	Appendix A - Interview ID: 240
7666701220	0 E	Port of Seattle (T-102)	Westar Marine Services	Yes	Appendix A - Interview ID: 229
5367204100	2.1 E	Westcore River Street LLC	Westcore River Building	Yes	Appendix A - Table A1
7666701220	0 E	Port of Seattle (T-102)	Western Marine Construction, Inc.	Yes	Appendix A - Table A1
7666701220	0 E	Port of Seattle (T-102)	Western Towboat Co.	Yes	Appendix A - Interview ID: 230
Offsite Users					
NA	NA	NA	Argosy Cruises	No	NA
NA	NA	NA	Brusco Tug & Barge	Yes	Appendix A - Table A1
NA	NA	NA	Crowley Marine Services	Yes	Appendix A - Interview ID: 242
NA	NA	NA	Foss Maritime Company	No	NA
NA	NA	NA	Island Tug and Barge	No	NA
NA	NA	NA	Lady Kate, Inc.	No	NA
NA	NA	NA	Manke Tug & Barge Company	Yes	Appendix A - Table A1
NA	NA	NA	National Oceanic and Atmospheric Administration	Yes	Appendix A - Table A1
NA	NA	NA	Pacific Towing Services, Ltd.	No	NA
NA	NA	NA	U.S. Coast Guard	Yes	Appendix A - Table A1

Table 1. Survey Response Summary: Water-Dependent Users and Recreational Use Businesses/Associations

Tax Parcel ID#	Approx. River Mile	Owner	Tenant	Responded to Survey?	Interview Form
Recreational Use Businesses/Associations					
7327901195	3.0 W	King County	City of Seattle, Parks Dept. (Duwamish River Park)	Yes	Appendix A - Table A1
7327902355	3.05 W	City of Seattle	City of Seattle, Parks Dept. (Duwamish Waterway Park/Duwamish Rowing Club)	Yes	Appendix A - Table A1
7666703670	0.45 W	City of Seattle	City of Seattle, Parks Dept. (Herrings House Park)	Yes	Appendix A - Table A1
0001600061	4.1 W	Owned by Trust	Duwamish Yacht Club	No	NA
NA	2.85 W	Port of Seattle	Eighth Ave Public Access	Yes	Appendix A - Table A1
NA	NA	Alki Kayak Tours	NA	Yes	Appendix A - Table A1
6871200350	2.35 W	Boyer Towing Inc.	River View Marina	Yes	Appendix A - Interview ID: 241
7666703460	0.1 W	Port of Seattle	T-105 (Park/Public Access)	Yes	Appendix A - Table A1
7666703532	0.1 W	Port of Seattle	T-105 (Park/Public Access)	Yes	Appendix A - Table A1
0001600044	3.5–3.7 W	Port of Seattle	T-117	Yes	Appendix A - Table A1
0423049187	2.85 W	Port of Seattle	Turning Basin #3 (Park/Public Access)	Yes	Appendix A - Table A1

Notes:

NA = not applicable

^a Information obtained from property owner.

^b Information obtained from property owner and tenant.

^c Information obtained from consultant to the property owner.

^d Limited information provided by real estate broker.

Table 2. Survey Response Summary: Owners of Residential and Waterfront Properties without Water-Dependent Facilities

Tax Parcel ID#	Approx. River Mile	Owner	Tenant	Responded to Letter?	Notes
Owners of Residential and Waterfront Properties without Water-Dependent Facilities					
0423049001	4.8 W	Owned by Trust	AIF Trailer Leasing	No	
1924049002	1.3 E	King County	Ardagh Glass Inc.	No	
1722802315	1.4 E	Ardagh Glass Inc.	Ardagh Glass Inc.	No	
5624200990	4.4 E	Owned by Trust	Boeing Development Center	Yes	Confirmed no water-dependent uses
5624201038	4.3 E	Boeing	Boeing Developmental Center	Yes	Confirmed no water-dependent uses
0003400018	4.6 E	Boeing	Boeing Developmental Center	Yes	Confirmed no water-dependent uses
0423049150	4.8 W	Owned by Trust	Boeing Employees Activity Center	Yes	Confirmed no water-dependent uses
0001600014	3.75 E	Boeing	Boeing Isaacson	Yes	Confirmed no water-dependent uses
0022000005	3.0 E	Boeing	Boeing Plant 2	Yes	Shoreline habitat restoration project
2185000005	3.2 E	Boeing	Boeing Plant 2	Yes	Shoreline habitat restoration project
3324049002	3.35 E	Boeing	Boeing Plant 2	Yes	Shoreline habitat restoration project
0001600020	3.5 E	Boeing	Boeing Plant 2	Yes	Shoreline habitat restoration project
7883608603	3.85 W	Boeing	Boeing Radiation Effects Lab	Yes	Confirmed no water-dependent uses
7883608601	3.7 W	Boeing	Boeing South Park	Yes	Confirmed no water-dependent uses
0007400033	3.8 E	Boeing	Boeing Thompson Site	Yes	Upland MTCA site
0423049016	4.95 E	Boeing	Boeing Vacant Land	Yes	Confirmed no water-dependent uses
7327904100	2.8 W	Cassell Point LLC	Cassell Point LLC	No	
5624200950	4.55 W	City of Seattle	City of Seattle	Yes	Confirmed no water-dependent uses
5367202410	2.0 E	City of Seattle	City of Seattle, Dept. of Transportation	Yes	Confirmed no water-dependent uses
5367202510	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation	Yes	Confirmed no water-dependent uses
5367202513	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation	Yes	Confirmed no water-dependent uses
5367202518	2.2 W	City of Seattle	City of Seattle, Dept. of Transportation	Yes	Confirmed no water-dependent uses
5624200931	4.3 W	City of Seattle	City of Seattle, Seattle City Light	Yes	Confirmed no water-dependent uses
5624200992	4.4 E	City of Seattle	City of Seattle, Seattle City Light	Yes	Confirmed no water-dependent uses
5624200930	4.45 W	City of Seattle	City of Seattle, Seattle City Light	Yes	Confirmed no water-dependent uses
2136200666	2.75 E	City of Seattle	City of Seattle, Seattle City Light (Georgetown Pump Station)	Yes	Confirmed no water-dependent uses
7327905700	2.7 W	City of Seattle	City of Seattle, Seattle Public Utilities	Yes	Confirmed no water-dependent uses
3224049037	3.15 W	City of Seattle	City of Seattle, Seattle Public Utilities	Yes	Confirmed no water-dependent uses
2924049110	2.8 E	City of Seattle	City of Seattle, Seattle Public Utilities (Slip 4)	Yes	Habitat restoration project
2136200681	2.65 E	Cleanscapes Inc.	Cleanscapes Inc.	No	
0001800113	2.3 E	Individual Owner	Dawn Food Products	No	
5367204560	1.8 E	Individual Owner	Duwamish Marine Center	No	
5367203447	1.95 E	Individual Owner	Duwamish Marine Center	No	
5367204505	1.75 E	American Life Insurance	General BioDiesel	Yes	Confirmed no water-dependent uses
2185000695	3.25 W	Hmh LLC	Hmh LLC	No	
7327905770	2.6 W	Individual Owner	Individual Owner	No	
7327905760	2.65 W	Individual Owner	Individual Owner	No	
3224049004	3.15 W	Individual Owner	Individual Owner	No	
3224049003	3.15 W	Individual Owner	Individual Owner	No	
2185000520	3.17 W	Individual Owner	Individual Owner	No	
2185000495	3.2 W	Individual Owner	Individual Owner	No	

Table 2. Survey Response Summary: Owners of Residential and Waterfront Properties without Water-Dependent Facilities

Tax Parcel ID#	Approx. River Mile	Owner	Tenant	Responded to Letter?	Notes
2185000475	3.2 W	Individual Owner	Individual Owner	No	
2185000505	3.2 W	Individual Owner	Individual Owner	No	
2185000815	3.25 W	Individual Owner	Individual Owner	No	
2185000685	3.3 W	Individual Owner	Individual Owner	No	
5422600060	4.0 E	Centerpoint Properties	Insurance Auto Auctions	No	
2185000895	3.3 W	King County	King County Roads	No	
7327904049	2.85 W	King County	King County Wastewater	No	
423049073	4.8 W	Owned by Trust	Pamco Construction	No	
2136200670	2.7 E	Cleancescapes Inc.	Puget Sound Truck Lines	No	
5367204080	2.2 E	Clpf-Seattle Dist Cntr Lp	Seattle Distribution Center	No	
7666703464	0.1 W	Encore Oils LLC	SeQuential Pacific Bio Diesel	No	
7327905750	2.65 W	Six Fourteen South Logistic	SFR	No	
3573201061	1.0 E	5055 Properties LLC	Sno Pac Products	No	
0001600023	3.6 E	Star Forge LLC	Star Forge LLC	No	
5367202512	2.0 W	State of Washington	State of Washington	Yes	No water-dependent uses
5367202516	2.0 W	State of Washington	State of Washington	Yes	No water-dependent uses
7666700315	0 E	Port of Seattle	T-104 (PCC logistics)	Yes	No water-dependent uses
7666700390	0.3-0.4 E	Port of Seattle	T106: Seattle Tunnel Partners/Fisk/ US Customs and Border Protection/ConGlobal)	Yes	No water-dependent uses
2185600025	3.4 W	South Park Marina Ltd Part	Tire Factory	Yes	No water-dependent uses
7327901215	3.1 W	Individual Owner	United Site Services of Seattle WA	No	
1924049051	1.15 E	King County	United Western Supply/Ardagh Glass	No	
5367204545	1.8 E	Individual Owner	Vacant	No	
7327902395	3.0 W	Wamm LLC	Wamm LLC	No	
7327902520	2.9 W	Silver Bay Logging Inc.	Work Boats Northwest	No	

Table 3. Overwater Structures, Moorages, and Other Physical Structures ^a

Tax Parcel ID#	Assessment Number	Structure	Upstream and Downstream (if applicable) River Miles	River Side	Description	Use	Berthing Operational Status ^b	
7666701220	01	Harbor Island Marina (Terminal 102 - Port of Seattle)	0.00	W	Marina	Recreational and commercial vessel moorage	Operational	
7666703440	02	Glacier Northwest South Wharf (Terminal 103 - Port of Seattle)	0.00	W	Timber bulkhead with solid fill fronted by timber pile wharf, steel transfer bridge	Receipt of sand, gravel, and stone (South); Kiewit/GC (North)	Operational	
7666700350	03	Ash Grove Cement North Wharf	0.10	E	Timber pile, concrete decked wharf	Shipment of bulk cement	Not Operational	
7666700350	04	Ash Grove Cement South Pier	0.20	E	Steel and timber pile, timber decked piers and central steel conveyor structure.	Receipt of coal, gypsum, gravel, and rock lime	Operational	
7666703540	05	Berth No. 1 Wharf (Terminal 105 - Nucor Steel/ General Recycling Of Washington)	0.30	W	Steel sheet pile bulkhead, concrete wharf, asphalt-surfaced deck.	Receipt of scrap metal	Operational	
7666703540	06	Berth No. 2 Wharf (Terminal 105 - Nucor Steel/ General Recycling Of Washington)	0.40	W	Timber bulkhead with solid fill fronted by timber pile, timber-decked wharf	Mooring vessels	Not Operational	
1924049041	07	Tilbury Cement East Marginal Terminal Wharf (King County/Manson Construction)	1.00	E	Concrete pile, concrete-decked wharf (adjacent to Manson wharf)	Receipt of bulk cement and gravel	Operational	
3573200975	08	U.S. Government Wharf (Portfolio Management Div/Federal Center South)	1.00	E	Contiguous timber and concrete wharf, concrete-decked structures with a floating dock (north side of Slip 1)	Mooring vessels / previously used for containerized shipments	Operational	
1924049041	09	Manson Construction Wharf	1.00	E	Concrete pile, concrete-decked wharf, timber wharf extension, and steel dolphins (to south side of Slip 1)	Mooring vessels and floating equipment, and moving supplies to and from barges	Operational	
1924049003	10	Lafarge Corporation Raw Materials Wharf	1.00	1.25	W	Steel sheet pile, cellular bulkhead	Receipt of limestone, shale, coal, and slag	Operational
1924049003	11	Lafarge Corporation Cement Wharf	1.00	W	Two L-shaped timber pile, timber-decked piers, connected by timber catwalks (south of Kellogg Island)	Receipt and shipment of bulk cement	Operational	
1924049043	12	J.A. Jack and Sons Wharf	1.20	E	Offshore row of 5 steel dolphins and 1 timber dolphin, conveyor structure, and catwalk.	Receipt of limestone	Operational	
1924049026	13	Alaska Marine Lines Dock No. 1	1.25	W	Timber pile, timber and concrete-decked wharf.	Containerized general cargo	Operational	
1924049028	14	Duwamish Shipyard Graving Dock Wharf	1.30	W	Wharf: concrete and timber pile bulkhead; historical graving dock (subsequently filled in): steel sheet pile retaining walls, concrete floor, steel gate	Mooring vessels for repair / previous shipment of concrete fabrications and mooring vessels	Operational	
1722802315	15	General Construction Mooring	1.40	E	Offshore row of 6 steel dolphins	Mooring floating equipment and barges	Operational	
1924049028	16	Duwamish Shipyard Wharf	1.40	W	Irregularly shaped timber pile, timber-decked offshore wharf, timber floats connect dolphins, dredged basin at rear of dolphins on south side	Mooring vessels for repair, mooring dry docks	Operational	

Table 3. Overwater Structures, Moorages, and Other Physical Structures ^a

Tax Parcel ID#	Assessment Number	Structure	Upstream and Downstream (if applicable) River Miles	River Side	Description	Use	Berthing Operational Status ^b	
1924049029	17	Glacier Northwest West Terminal Wharf	1.50	W	Concrete pile, concrete-decked marginal wharf with concrete-decked approach	Receipt of bulk cement	Operational	
1924049092	18	James Hardie Gypsum Wharf (BPB Gypsum Inc./Certain Teed Corporation)	1.60	E	Steel and timber pile , timber-decked T-head pier extending from a steel sheet pile bulkhead with solid fill.	Receipt of bulk cement and gypsum rock	Operational	
5367202505	19	Northland Services (Terminal 115 - Port of Seattle)	1.50	1.90	W	Berth 1: Piers A and C center timber pier, Pier B ramp support structure and A-Frame.	Barge loading and unloading	Operational
5367202505	20	International Terminal North Wharf (Terminal 115 - Port of Seattle)	1.60	1.80	W	Concrete piles support 103-ft wide concrete apron over water. Riprap slope and sheet pile bulkhead on inner land side.	Containerized general cargo and heavy lift items; receipt of steel products; receipt and shipment of forest products	Operational
1924049075	21	Glacier Northwest Slip 2 Wharf	1.70	E	Steel pipe pile dolphins, steel transer span, and timber-pile, timber-decked wharf (north side of Slip 2)	Receipt of sand and gravel	Operational	
5367202505	22	South Wharf (Terminal 115 - Port of Seattle)	1.80	W	Two timber pile, timber-decked finger piers with concrete abutements	Containerized general cargo and heavy lift items	Operational	
5367204565	23	Filter Engineering Wharf (Duwamish Marine Center/ Filter Engineering/ Samson Tug and Barge)	1.80	E	Steel/timber pile pier, concrete piers, and floating docks (south side of Slip 2)	Moving construction equipment to and from barges and moorage	Operational	
5367202505	24	Seafreeze Limited Partnership Wharf (Terminal 115 - Port of Seattle)	1.90	W	Concrete pile, concrete-decked offshore wharf with concrete approach and steel catwalks	Receipt of fish and seafood	Operational	
2924049090	25	Alaska Marine Lines Dock No. 2	2.10	W	Concrete pile, concrete-decked wharf	Containerized general cargo; mooring vessels	Operational	
0001800104, 0001800128	26	Northland Services Fox Avenue Terminal Wharf (Seatac Marine Properties LLC)	2.10	2.20	E	Concrete pile, concrete-decked wharf extending from sheet pile bulkhead (to south of Slip 3)	Conventional and containerized general cargo	Operational
5367204200, 5367204160, 5367204100	27	Silver Bay Logging South River Street Wharf	2.10	E	Silver Bay - Timber pile, timber-decked wharf extending from timber bulkhead. Mooring barges. Rainer Petroleum – Floating dock and boat house. Westcore River – Pile supported building and dolphins for a barge berth (north side Slip 3).	Mooring barges and small vessels.	Operational	
6871200620	28	Boyer Alaska Barge Line Mooring	2.30	W	Two offshore breasting dolphins fronting natural bank	Mooring floating equipment	Operational	
6871200350	29	MC Halverson Marina (Boyer Towing Inc./ River View Marina)	2.30	W	Floating docks	Barge and vessel moorage	Operational	
2136200706	30	Seattle Iron & Metals North Wharf	2.40	E	Timber pile, asphalt-surfaced, timber-decked wharf extending from steel sheet pile bulkhead	Receipt of scrap metal by barge	Operational	

Table 3. Overwater Structures, Moorages, and Other Physical Structures ^a

Tax Parcel ID#	Assessment Number	Structure	Upstream and Downstream (if applicable) River Miles	River Side	Description	Use	Berthing Operational Status ^b	
6871200210	31	Boyer Alaska Barge Line Seattle Wharf	2.40	W	Timber bulkhead, asphalt surfaced timber pile, concrete-decked wharf with transfer span	Containerized general cargo, lumber, mooring tugs and barges	Operational	
2136200706	32	Seattle Iron & Metals South Wharf	2.50	E	Timber pile, asphalt-surfaced, timber-decked wharf extending from steel sheet pile bulkhead	Receipt of scrap metal by barge	Operational	
7327906685, 7327906645, 7327906755	33	Alaska Washington Building Materials Co. Wharf (Boyer Towing Inc./ Pacific Pile and Marine)	2.50	W	Irregularly shaped concrete and timber bulkhead with solid fill, fronted by three timber dolphins	Barge and vessel moorage	Operational	
7327905725	34	Hurlen Construction Mooring Six Twenty Six Logistics/ Pacific Pile and Marine)	2.65	W	Timber pile, timber-decked pier and timber dolphins	Mooring floating equipment, moving supplies to and from barges	Operational	
7327905350	35	Hurlen Construction Wharf (Pacific Pile and Marine)	2.70	W	Timber pile, timber-decked wharf	Mooring floating equipment, moving supplies to and from barges	Operational	
2136200641	36	Northland Services 8th Avenue Terminal Wharf (Crowley Marine Services/ Waste Management)	2.80	E	Concrete pile, concrete-decked wharf (north side of Slip 4)	Conventional and containerized general cargo	Operational	
7327903645	37	Silver Bay Logging 8th Avenue Wharf	2.90	W	Steel pile, steel beam, timber and steel grating decked wharf	Receipt of lumber by barge	Operational	
0001600020, 3324049002, 2185000005 2185600025	38	Boeing Plant 2	3.10	3.50	E	One pile-supported building	Pile supported building and parking lot. Shoreline habitat restoration.	NA
	39	South Park Marina	3.40	W	Marina	Moorage of commercial and recreational vessels	Operational	
0001600060	40	McElroy George and Assoc.Inc. (National Industrial Holding/ Sea King Industrial Park LLC)	4.00	W	Concrete pile, concrete-decked finger pier	Vessel moorage	Operational	
5422600010	41	Northwest Container Services (Container Properties LLC)	4.10	E	Dolphins for mooring	Moorage of barges	Operational	
0001600061	42	Duwamish Yacht Club	4.10	W	Marina	Moorage of recreational vessels	Operational	
5624200005	43	Delta Marine Industries Wharf	4.20	W	Concrete finder piers, offshore row of permanently moored floats, approach from concrete-paneled bulkhead	Mooring vessels for outfitting and repair; fiberglass vessels manufactured on site	Operational	
5624201032	44	The Boeing Company Seattle Wharf	4.30	E	Six concrete pile, concrete-decked, asphalt-surfaced loading piers (Slip 6).	Mooring barges; previously not used	Operational	

Table 3. Overwater Structures, Moorages, and Other Physical Structures ^a

Tax Parcel ID#	Assessment Number	Structure	Upstream and Downstream (if applicable)		River Side	Description	Use	Berthing Operational Status ^b
			River Miles	River Miles				
7666703460, 7666703532	45	Single-span pier and large pile fields associated with historical vessel launch facilities (Terminal 105 - Port of Seattle)	0.15	0.20	W	Single-span pier and large pile fields associated with historical vessel launch facilities	Park/public access	Not Operational
NA	46	Submerged sewer line crossings	0.43	0.48	Both	Submerged sewer line crossings		NA
NA	47	Overhead power cable crossing	0.38	0.47	Both	Overhead power cable crossing		NA
NA	48	Overhead power cable crossing	1.95		Both	Overhead power cable crossing		NA
NA	49	Overhead power cable crossing (Not Found)	3.60		Both	Overhead power cable crossing (Not Found)		NA
NA	50	Overhead power cable crossing	4.40		Both	Overhead power cable crossing		NA
NA	51	Pile group along Kellogg Island's west side	0.60	0.90	W	Pile group along Kellogg Island's west side	Oil boom storage	Not Operational
NA	52	Pile and dolphin groups along Kellogg Island's east side	0.60	0.90	W	Pile and dolphin groups along Kellogg Island's east side	Unknown	Unknown
NA	53	Submerged cable and pipeline area	1.80	2.10	Both	Submerged cable and pipeline area		NA
NA	54	First Avenue Bascule Bridge	2.10	2.20	Both	First Avenue bascule bridges. The west and east bridges have 145-ft horizontal clearance closed and 120-ft horizontal clearance open. Vertical clearance is 22 ft (39 ft at center) when closed.		NA
NA	55	Submerged cable area (Not Found)	2.85	3.00	Both	Submerged cable area (Not Found)		NA
NA	56	Submerged cable area (Not Found)	3.15	3.40	Both	Submerged cable area (Not Found)		NA
NA	57	South Park Bridge	3.30	3.40	Both	South Park (recently replaced). Also known as the 14th/16th Ave South Bridge.		NA
NA	58	Abandoned and working piles and dolphins (not used)	NA		NA	Abandoned and working piles and dolphins (not used)		Not Operational
7666700510	59	T108 Berth (Port of Seattle/ Salmon Bay Barge Line, Inc.)	0.50		E	Vessel berth with marginal walkway and access walkways	Barge and vessel moorage	Operational
3573201061	60	Timber Pile Field (5055 Properties LLC/ Sno Pac Products)	1.00		E	Timber Pile Field	NA	Not Operational
1924049051	61	Box Culvert and Pile Field (King County/ United Western Supply/ Ardagh Glass)	1.10		E	Pile group, two timber mooring dolphins, and box culvert	NA	Not Operational
0001800113, 0001800091	62	Mooring/Berthing Dolphins (Dawn Food Products/ Seattle Boiler Works)	2.30		E	Timber and steel mooring and berthing dolphins	Barge berths	Operational

Table 3. Overwater Structures, Moorages, and Other Physical Structures ^a

Tax Parcel ID#	Assessment Number	Structure	Upstream and Downstream (if applicable) River Miles	River Side	Description	Use	Berthing Operational Status ^b
2136200670	63	Miscellaneous Waterfront Structures (Cleancescapes Inc./ Puget Sound Truck Lines)	2.70	E	Waterfront building with timber pile wingwalls	Unknown	Not Operational
2924049043	64	Timber Bulkhead (First South Properties LLC/ Cedar Grove Composting, Inc.)	2.85	E	Timber bulkhead	Unknown	Not Operational
0001600020, 0001600023, 000160014, 0007400033, 5422600060	65	Miscellaneous Steel and Timber Bulkheads (Boeing; Star Forge LLC; Centerpoint Properties/ Insurance Auto Auctions)	3.50 4.00	E	Steel and timber bulkheads	Unknown	Not Operational
0003400018	66	Boeing Platforms and Groins	4.70	E	Timber wharf and timber pile groins	Unknown	Not Operational

Notes:

NA = not applicable

^a Adapted from Table 2-10 from the Lower Duwamish Waterway Feasibility Study (AECOM 2012)

^b Berthing status based on the following visual observations only:

Operational: Structures observed to have vessels at berth and structures identified as being operational during the in-person surveys

Not Operational: Structures with no observed in-water activity, structures without berthing capabilities, and structures identified as not operational during the in-person surveys

Unknown Operational Status: Assigned to structures that did not fit the guidance provided in the previous two categories

APPENDIX A

WATERWAY USER SURVEY DATA

Disclaimer: The responses from interviewees are presented in this appendix. The views and opinions expressed are those of the interviewees and do not necessarily reflect the views of LDWG or any other agency or organization. All information in this appendix is provided “as is,” with no guarantee of completeness, accuracy, suitability, or validity.

Interview ID:	125
Interviewee:	Port of Seattle
Subject property(s):	T-108W shoreline parcel/Diagonal Ave S Public Access (Salmon Bay Barge Line, Inc.)
Date of Interview:	6/9/2017
Business/organization type:	Barge shipping
Business physical address(es):	4699 Diagonal Ave S, Seattle, WA 98134
Tax parcel ID#:	7666700510
Approximate river mile:	0.5–0.7 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Salmon Bay stores one empty deck barge at a time at the overwater structure.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Interviewee does not know transit route. Will follow up. Interviewee does not think that Salmon Bay has other facilities on LDW so likely does not travel upstream from T-108.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

No seasonality. Often one barge is moored at site.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Do not use any other features, per interviewee's knowledge. Likely travels down navigation channel, but transit route is unknown.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Duw/Diag EAA cap constrains ability to spud or anchor. Vessel speed constraints are not defined, though maneuvering must be slow close to structure to safely berth.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

No

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Not known

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

One empty barge at a time (deck barge).

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring or spudding allowed.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Tug is used. Interviewee does not know which company is used.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds not used for Salmon Bay barge at T-108.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what

conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

No bridle chain dragging known to occur in LDW, per interviewee.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee has no drawings.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

This structure is at the Duw/Diag EAA cap. LDWG has documents related to dredge/cap activities at EAA.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No future plans. However, piles are wood and will be replaced with steel if begin to deteriorate. Catwalk is condemned, but interviewee is not sure if it will be or should be fixed.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Contact Salmon Bay

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Best to view from water; contact Salmon Bay.

ADDITIONAL DESCRIPTION

Salmon Bay uses overwater structure to tie one empty barge at a time. Public access may be at street end (Diagonal), but no public access to overwater structure. Shoreline and catwalk are dilapidated and unsafe for public access. Soil for dirt bike track construction (possibly for events at Century Link) is stored in the uplands. Tribes also place nets on/near structure when net fishing.

Interview ID:	126
Interviewee:	Port of Seattle
Subject property(s):	T-107 submerged lands/Kellogg Island mooring tenants: Alaska Marine Lines - moors south of Kellogg Island; T-115 (Alaska Marine Lines/Aloha Marine Lines)
Date of Interview:	6/9/2017
Business/organization type:	Barge shipping
Business physical address(es):	4750 West Marginal Way SW, Seattle, WA 98106 5000 West Marginal Way SW, Seattle, WA 98106
Tax parcel ID#:	1924049103; 5367202505
Approximate river mile:	0.6–0.9 W; 1.5–2.0 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Single file/parallel parking style line up of two empty barges to be staged until needed or until ready to fill. Steel dolphins on south end of Kellogg Island hold AML barges. Are held empty until ready to fill at T-115 or other locations.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

AML barges travel to T-115, or other AML yards, to unload then back to subject area to stage empty barges. Also stage empty barges at Pier 34 or at Elliott Bay marine exchange buoys (outside LDW) if LDW areas are full.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Not seasonal. However, transit to Alaska may be affected by winter in Alaska (icy conditions). But AML can deliver to Hawaii too. Operations are every day with little seasonal variability.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Features at T-115, navigation channel and opening of Spokane Street Bridge are essential.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Tides don't affect mooring at these dolphins. An old tug is moored nearby at LaFarge, but does not pose a constraint. Water depth is low/intertidal on west side of Kellogg Island, so travel is never around west side of Kellogg Island to access dolphins.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Spokane St Bridge openings to allow passage of full barges. No other constraints.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Assumed to be down navigation channel to T-115 to offload then back to subject area (mooring dolphins on south end of Kellogg Island).

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Interviewee says to see Lynden/Northland Services/AML website for fleet information.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Just tie up to dolphins, no anchoring.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Western Towboat used a lot by AML. Western Towboat has a Wednesday run to Alaska. Two Western Towboats run the LDW daily. They tie up at the commercial dock at Pier 34 (outside LDW).

For activities involving barges, when and where are spuds used (or are moorings used instead)?

n/a. No spudding for container vessels.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee does not have drawings.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No knowledge about dredging.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Steel dolphins are in good condition.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

AML should be interviewed.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Interviewee does not have contact. To be obtained during AML interview.

ADDITIONAL DESCRIPTION

Interview covers south end of Kellogg Island. Alaska Marine Lines moors up to two barges in single file along steel dolphins at south end of Kellogg Island.

Interview ID:	127
Interviewee:	Port of Seattle
Subject property(s):	T-107 submerged lands/Kellogg Island mooring tenants: General Construction & Manson - moors east of Kellogg Island
Date of Interview:	6/9/2017
Business/organization type:	Construction
Business physical address(es):	4750 West Marginal Way SW, Seattle, WA 98106 5000 West Marginal Way SW, Seattle, WA 98106
Tax parcel ID#:	1924049103
Approximate river mile:	0.6–0.9 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

East side of Kellogg Island. Manson moors to the south using spuds. General Construction (GC) moors to the north using spuds. Crane barges lower spuds. Other barges raft up to spudded barges.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

GC—Yard 1 is at T-103. Yard 2 at RM 1.4E. GC barges moor along northern half of east side of Kellogg Island. Travel is to/from these three locales. Barges are positioned upstream–downstream orientation, stacked east to west two to four barges deep.

Manson—other yard is in Slip 1. Moorage is on southern half of east side of Kellogg Island. Travel is across waterway from/to KI to/from Slip 1. Barges oriented cross river flow (east-west orientation of bow-stern) stacked north–south.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Frequency is dependent upon volume of construction work. Not otherwise seasonal/intermittent. Work is conducted in many locales.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

GC Yards 1 and 2. At Yard 1 (T-103), maintenance that requires land access is conducted. At Yard 2, items are staged (RM 1.4E). Some maintenance is conducted top side at Kellogg Island. Access provided by skiff.

Manson uses Slip 1. Interviewee assumes maintained navigation channel needed by both tenants.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Dolphins are too shallow to be used; tenants moor barges with spuds instead.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

n/a

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Vessels move all around between sites listed prior.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Interviewee does not know specifics other than that vessels are crane/derrick barges, material barges, flat deck barges. Exact barges and numbers depend upon flow of work.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Spudding along east side of Kellogg Island.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

GC has two small tugs but no trained captains. So do not use much in LDW. Tugs are 25 and 40 fee. Keep tugs in LDW or lift up with crane onto beach. Can use own tugs to move small distances, especially if encroaching on navigation channel and need to move quickly.

Manson uses own tugs.

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Manson has own tugs. GC uses many different companies including Island Tug and Barge, Manson's tugs (when work together on jobs, such as I-90 floating bridge), Boyer Towing, Campbell, and Star Marine.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

All of the mooring that is the subject of this interview involves spuds (east side of Kellogg Island).

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Interviewee does not think chain dragging is common or advisable in LDW.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee does not have drawings.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee does not know about dredging.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No planned changes. No actual structures used.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Interviewee suggests interviews with GC and Manson.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Interviewee suggests contacts to be arranged with Manson and GC.

ADDITIONAL DESCRIPTION

Interview covers moorage on east side of Kellogg Island by GC and Manson.

Interview ID:	229
Interviewee:	Westar Marine Services
Subject property(s):	T-102 (Western Marine Services)
Date of Interview:	7/7/2017
Business/organization type:	Construction
Business physical address(es):	1011 SW Klickitat Ave, Seattle, WA 98134
Tax parcel ID#:	7666701220
Approximate river mile:	0 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Westar Marine has moored tugs at Harbor Island Marina for the past 3 to 3.5 years. Most vessels are moored at the Northlake Way facility.

Westar Marine has two 75-foot mooring locations at Harbor Island Marina (eastern side of marina). It can moor four vessels there (two on dock face; two tied to others).

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

In and out of LDW via West Waterway to/from Harbor Island Marina. Conduct much Puget Sound work, so some access to LDW is simply to moor vessels. Also move barges for General Construction/Kiewit (GC) and for Manson. Move GC barges to/from GC Yard 1 (T-105), Kellogg Island, GC Yard 2 (RM 1.2), and GC Yard 3 (interviewee says in Slip 4; later interviewee, Western Towboat, says GC Yard 3 is in Slip 6 and Waste Management is in Slip 4). Move Manson barges to/from Slip 1 and Manson mooring directly outside of Slip 1 and Kellogg Island.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Dependent on client's activities. GC's work (lots of pile driving) slows down when fish windows are closed, work around Puget Sound.

Operations are also restricted when Tribal gill nets are out.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Harbor Island Marina, Slip 1, camel log near Slip 1, moorings at GC Yards 1, 2, and 3. Railroad bridge openings, First Avenue bridge openings (rarely) to access Slip 4 (this may need to refer to Slip 6). First Avenue is closed to openings during traffic rush hours (0600 to 0900 and 1500 to 1800). If vessel exceeds 5,000 gross tons, bridge must be opened. Westar does not travel past First Avenue Bridge very often.

GC moorage at Kellogg Island restricted by water depth and proximity to navigation channel. Can only go 3 wide.

At T-105, GC uses 500-ft long (face) dock for barge storage.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Slip 4 use is tide dependent. Barges are allowed to beach in slip. Tugs have to time work around these tides. Interviewer noted the RNA at Slip 4 EAA cap, and interviewee said area is so small that he doesn't notice this (Interviewee may have been mixing this up with Slip 6 which GC uses). In Slip 4 (6?), two barges can fit near head, three at mouth. Tugs need 8.5 to 9 ft of draft, so slip access is restricted.

East side of Kellogg Island is also shallow and tug access is tide dependent.

Manson's moorings at and outside of Slip 1 are not tide dependent. NOAA docks a very large vessel on north side of Slip 1 (proving that slip is deep). Manson's mooring outside of Slip 1 is a camel log (dolphins holding a floating log).

Tribe fishing nets cause physical restrictions and sometimes completely block in eastern side of Harbor Island. Often lights on buoys are not working, so towing at night has potential to damage nets. Nets are sometimes tied to tug cleats and then captains can't move tugs.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Railroad bridge openings are needed. Sometimes need First Avenue Bridge open, but don't often go that far upstream. Tide levels affect access around Kellogg Island and to slip.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

1. Harbor Island to/from Elliott Bay via West Waterway.
2. GC barges to/from GC Yards 1,2,3 and Kellogg Island.
3. Manson barges to/from Slip 1 and Kellogg Island.
4. During 520 bridge work, Westar also pulled barges of aggregate from Cal Portland out to Lake Washington for ballasting the pontoons. Also hauled scrap metal into LDW to drop off at Seattle Iron and Metal.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

1. Bear Cat (tug) is most often moored at Harbor Island Marina and operates in LDW and Puget Sound. 1,320 horsepower, twin Cummins QSK 19-M propulsion. 69 ft x 23ft x 8.9 ft (length, beam, draft). Frequency is about 3 weeks out of every month in LDW. Other week at Northlake.
2. Terilyn (tug) is 2nd most often moored at Harbor Island. 1,550 horsepower. Twin cat 3508E push boat with anchor winch. 50,000-lb line pull. 70.5 ft x 26 ft x 8.5 ft. Similar frequency in LDW to Bear Cat.
3. Other vessels sometimes in LDW are Scorpius (124 ft x 31.5 ft x 15 ft), Taurus (75 ft x 24 ft x 8 ft), Solana (65.4 ft x 24.1 ft x 8 ft), and Mudcat (71.7 ft x 21 ft x 4.5 ft).

Maintenance is performed at Northlake location. Movement between LDW and Northlake is based on need for maintenance and for work in Puget Sound. Vessels are also used in San Francisco (home base).

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Push GC and Manson barges into place. At Kellogg Island, these barges use spuds. At Slips 1 and 4 and GC Yards 1 and 2 the barges tie up to fixed structures.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

GC at Kellogg Island, Yards 1, 2, 3

Manson at Kellogg Island and Slip 1 (and camel log berth just outside of Slip 1).

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Interviewee is a tug boat operator.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Customers use spuds at Kellogg Island.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

All areas discussed involve barges towed by tugs. Bow-mounted bridle chains are not lowered and dragged in the mud. The bridle is picked up. Each chain shackle is 45 feet long. A shackle on each side of the bow connects in the middle, and a 90 foot long chain extends forward to the tug. The bridle is not drug. Although interviewee does not pull for AML, he noted that their draft is much deeper than their bridles would drag. In other waterbodies where water is shallow, some barges use the bridle chain as an anchor. This is not done in the LDW because of the current.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

n/a

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

n/a

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

n/a

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Interviewee can provide contacts for Manson and Kiewit. He does not know Ash Grove or Boyer. He says to contact Island Tug. Island has 8–10 tugs and 10 barges.

Suggested contacting SeaTac Marine, which goes past First Avenue bridge and moves large aggregate barges. Boyer also goes past First Avenue bridge and hauls aggregate barges.

He noted that Western Towboat will know a lot about other waterway users. Western has been operating on the LDW for over 60 years. Western ties two tugs at T-104 (Westrac 1 and 2 do ship handling assist). Western tows AML rail barges every Wed and Fri. Make runs to SE Alaska (Dutch and Prince William Sound).

Samson also makes cargo runs to Alaska.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

n/a

ADDITIONAL DESCRIPTION

Westar is a tug company based in San Francisco. It expanded to Seattle for the highway 520 floating bridge project. It moors at T-102 (east side of Harbor Island Marina). LDW clients are Manson and GC/Kiewit.

Interview ID:	230
Interviewee:	Western Towboat Co.
Subject property(s):	T-102 (Western Towboat Co.)
Date of Interview:	7/11/2017
Business/organization type:	Construction
Business physical address(es):	
Tax parcel ID#:	7666701220
Approximate river mile:	0 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Western Towboat has moored two tugs at Harbor Island Marina for past 20 years. Tugs conduct barge and container ship hauling and ship assist. Tugs move vessels and barges to the following LDW locations:

Ash Grove—RM 0.1 E, T-105, Nucor Steel (General Recycling on map)—RM 0.3W, T107 Kellogg Island mooring for Manson and GC, Kellogg Island south AML mooring, Manson and Cadman Slip 1 and RM 1.1W, Lafarge—RM 1.1 W, AML main yard at RM 1.2 W, AML yard is also at former Duwamish Shipyard, Terminal 115, Glacier NW—outside of Slip 2, Samson—mouth of Slip 2, SeaTac Marine—in and outside of Slip 3, AML yard 2—RM 2.2 W (need upstream berthing area mapped), Seattle Iron and Metal—RM 2.4E, Boyer Towing—RM 2.45W, Waste Management transload—Slip 4 (noted that this is not GC Yard 3 as indicated by Westar; GC Yard 3 is in Slip 6), Kelly Ryan (lease barges)—RM 4.0W, GC Yard 3—Slip 6, Delta Marine—RM 4.2W.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Western Towboat has many customers and operates throughout the LDW; although most work is downstream of South Park Bridge, and most upstream customer is Delta Marine. Western moves container freight barges, bulk aggregate barges, heavy lift barges, cement barges, and construction equipment.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Work is dependent upon customers' schedules. Many barges leave for work in Alaska during first week of June and stay through summer to Sept/Oct. Western works with these barges when they come back to LDW. When barges need repair, they are moved out of LDW to other locations, to shipyards where repairs can occur.

Average of six barge shifts daily. Work is year-round.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Deep water is needed. Most in- and over-water structures used by Western's customers. Many customers need deeper berths. Can only access upstream of Boyer during mid to high tide.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Cannot travel upstream of Delta Marine. Depth constraints at GC Yard 1/T-103—needs high water, Slip 2, Slip 6, Slip 4. Customers have had difficulty getting permits to dredge and to drive piles, so deepening is difficult.

First Ave. and South Park Bridge openings (not during rush hour) can restrict work. Tug can fold down upper mast to travel under these bridges. Spokane Street Bridge opens any time vessel traffic needs it.

Gill nets during salmon fishing season constrain movement. Interviewee is concerned with safety (ability of fire boats to access structures).

Fires have occurred recently at Harbor Island Marina and at T-107 (noted decrepit structure at Duw/Diag EAA). Nets now are associated with numbered placards along shoreline so that when vessel operators report nets to Tribal Police, they know whom to contact. However, Tribes police themselves, and nets restrict vessel movement. Interviewee noted that Tribe is financially reimbursed for nets tied to Port facilities and tenant vessels that are damaged or removed. However, non-Port entities have little recourse. Tug operators have to wait for nets to be moved. Tribe boats are not properly equipped with PFDs and running lights. Litter and buoys left in place are navigation hazards. Customers incur costs of blockages because tug operators are paid for time until they get back to home dock.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Areas restricted by low water are noted in above response. Bridge openings at South Park and First Avenue Bridges can restrict traffic, but most of navigation is downstream of these bridges.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Western Towboat transits many places along the LDW, has many customers.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Tugs: Pacific 1550 HP, 70-ft length; Triumph 2000 HP, 75-ft length, West Point 1200 HP, 60-ft length; Westrac II 2400 HP, 79-ft length; Westrac 2500 HP, 72-ft length. Interviewee marked up printout of company's tugs to indicate which vessels work in LDW.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Tugs move barges and vessels to permanent structures. Two locations use spudding: Kellogg Island and Pacific Pile (RM 2.7W, former Hurlen). Anchoring not mentioned.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

See Use section.

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

N/A, interviewee is a tug boat operator.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Two locations use spudding: Kellogg Island and Pacific Pile (RM 2.7W, former Hurlen).

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Chains may drag on about 1 out of every 15 barges. Chain drag depends on how deep vessel is drafting and how much the bridle/chains are pulled up.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

n/a

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

n/a. Interviewee noted customers who need berth deepening. It's restricted by ability to get permits for dredging and pile driving. He noted Cadman, JA Jacks & Sons, and AML (RM 1.2) needing deeper berths.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Interviewee thinks that many structures need upgrades. He noted camping under Spokane Street Bridge is a source of litter and graffiti to the river and to his vessels. He noted LaFarge needing a long wait time to install new dolphins (years ago) and that needs to do work on its northern dock (old wood piles).

He also mentioned a need for better shore power for his tugs at Harbor Island Marina. For night shifts, his crew sleeps on tugs. They can only run fridge with shore power, only 30 amps. Must turn on ship's generator to get more power.

Interviewee noted that AML replaced the dolphins south of Kellogg Island about 10 years ago. He also noted that LaFarge needs to do work on its northern dock (old wood piles).

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Boyer has been on the river a long time. Island Tug and Barge also has been on the river for many years.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

n/a. Interviewee is tenant at Harbor Island Marina.

ADDITIONAL DESCRIPTION

Western Towboat—tug operators on LDW since late 1960s. One of the current owners has piloted on LDW for past 10–12 years.

Interview ID:	231
Interviewee:	Manson Construction Co.
Subject property(s):	Manson Construction Co.
Date of Interview:	8/30/2017
Business/organization type:	Construction
Business physical address(es):	5209 E. Marginal Way South
Tax parcel ID#:	1924049041; 1924049070
Approximate river mile:	1.0 E; 1.05 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Manson noted that for many years, it has stored flat barges, derrick barges (barges with cranes and spuds), and tugboats in three locations in the LDW: inside of Slip 1 (south side), east side of Kellogg Island (south end of lease area, lease from Port of Seattle), at RM 2.35E (month-to-month lease from Seattle Boiler Works). Manson stores barges in LDW when it is not working in other locations on construction jobs. Additionally, Manson notes it has, for many years, performed top side repairs/outfitting of vessels in Slip 1. When engine upgrades were required for improved air emissions, replacements were installed in Slip 1.

Manson also can load and offload materials to/from barges in Slip 1. A rail spur extends from East Marginal Way South along the south side of Slip 1. Historically, there has been some ship construction and assembly building at the Slip 1 site. Hulls made in other locations were outfitted onsite.

The majority of Manson's work is outside of the LDW, but Manson has also performed heavy lift jobs in the LDW (for example, lifting large transformers from a vessel onto the upland at SCL yard), as well as small works for landowners along the LDW.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Slip 1, east side of Kellogg Island, RM 2.35 E

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

When fish construction windows are closed more equipment is stored in LDW because it's not out on jobs. The LDW has long been used for storage of vessels, some repairs (although major repairs are performed at shipyards), and material loading. Ideally vessels are out of the LDW working on jobs. Projects are conducted from Seattle to Anchorage, AK.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

For derrick/crane barges, spudding has always been the preferred method of mooring, so physical structures are not always necessary. Spudding is more secure than tying with ropes, which have to be checked often.

Largest tug has a 12-ft draft, and barges have shallow drafts, so navigation depths have not been an issue.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Mooring cannot be conducted alongside the piling on the east side of Kellogg Island because the area is too shallow. Mooring on the east side of Kellogg Island is performed by spudding and rafting outside of intertidal area with barges lined up in "slots" perpendicular to river flow direction. Vessels are not parked in locations where they can ground because it is not good for the equipment and because it is not allowed. A "grounding" is considered a reportable incident to the Coast Guard.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

First Avenue Bridge cannot open during rush hour traffic. Vessel movement is coordinated with this. Spokane Street Bridge can be opened anytime, but Manson tries to avoid rush hour. Interviewees notes that waterway users work well together. On a typical basis, vessels do not operate in areas where access is tide dependent.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Other than movement from the mouth of the LDW to any of the three moorage locations, most movement is back-and-forth from Kellogg Island moorage to Slip 1 as vessels are taken to yard to be prepared for a job. RM 2.35E is called Yard 2. Vessels

are stored there as well, but most transit is back-and-forth between Kellogg Island and Slip 1.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Ideally vessels are out on jobs and can be on jobs for long periods of time (e.g., SR 520 bridge project). Vessels are only in LDW when they are not out on jobs, so there is not a "typical" vessel count in LDW. The types of vessels stored in LDW are flat barges, crane/derrick barges, tug boats, and sometimes dredge barges. Largest tug has a 12-ft draft. Barges have 2–3 ft drafts.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Manson has its own tugs, but also frequently uses Western Towboat. Manson uses Western most often because it is already transiting the LDW and can grab barges as it has availability. Rates are also better when using a local tug because time billed is based on the time it takes the tug to get to/from its home port. Western is also familiar with Manson's equipment. Manson will use its own tugs when checking on roped up equipment at RM 2.35 E. Because this moorage is not visible from the main yard, it has to be visited when barges are tied by rope. A tug is used in case the barge needs to be maneuvered back into place. Spudding is ideal if it can be conducted because it's more secure than tying with a rope. Spudded vessels need fewer visual checks than roped/tied vessels.

Manson also sometimes uses Westar and Island Tug and Barge. Manson has used Foss in the past but because the Foss tugs are not moored in LDW, using Foss is more expensive than using other companies.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Using spuds on crane barges has always been preferred because it is more secure than roping. Crane barges are spudded at all three locations that Manson uses. Other barges can be rafted to spudded barges. When vessels are being worked on or have crew on board, they may not be rafted more than two vessels from shore, for fire safety purposes, for ingress/egress.

Spudding is also used if crane barge is performing a heavy lift job in the LDW. Manson's crane barges can lift heavy items off of vessels and place them on the upland, even where no overwater structure is present. The cranes have a long boom for moving/placing items.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Staged/towed locations/routes discussed in other responses. Manson does not use bow-mounted bridle chains in the normal operations. Bridle chains are utilized for large vessels for ocean voyages. If Manson does have rare occasion to use a bridle chain, it ties the chain up high and does not drag or lower it in the LDW. Manson's practice is to move heavily laden barges at high tide to avoid scour.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Drawings not provided. (Manson notes that drawings were provided in the DQR response and may be produced upon request.) Manson has rebuilt dock in Slip 1 twice and Cadman dock (sublease) in main channel/upstream of LDW at least once.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No dredging at Manson's facilities noted. Manson has performed dredging for other LDW parties including Ash Grove, Chiyoda, Cadman, Port, Corps, and City. Manson dredged in front of Slip 1 when it first leased the property from King County in the

early 1950s. Portions of Slip 1 were dredged by the U.S. Army Corps of Engineers in 1976 after a PCB spill by the Corps. No dredging has occurred in Slip 1 since.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Planned improvements/cleanup of head of Slip 1. Property recently purchased by Manson. Shoreline is impacted by sand blast grit and old derelict timbers/structures remain at head of slip. Redevelopment plans have not been fully developed. Over the long term, Manson may also replace, at mouth of the slip, the remaining approximately 50 ft of existing timber dock with a concrete pile dock.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

Future work at head of slip not fully planned.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Interviewer let Manson know that Moffat and Nichol would perform structure survey, and Manson noted that it is familiar with M&N.

ADDITIONAL DESCRIPTION

Manson owns parcel adjacent to head of slip. Manson is working on a soil/riverbank remediation of sand blast grit deposited by a previous owner. In-water piles and derelict timber structures are to be removed, and shoreline along head of slip is to be rebuilt. Plans are still being developed. Manson rents parcels on south side of slip from King County. Manson subleases a portion to Cadman, which has a berthing area just upstream of Slip 1.

Interview ID:	232
Interviewee:	Ash Grove Cement Co.
Subject property(s):	Ash Grove Cement
Date of Interview:	9/15/2017
Business/organization type:	Industrial
Business physical address(es):	
Tax parcel ID#:	7666700350
Approximate river mile:	0.2 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Ash Grove has two berths. The north berth is not used. The south berth can hold one barge at a time. It is used for offloading raw material (limestone) for cement or concrete manufacturing. Neighboring Stoneway Concrete manufactures concrete from Ash Grove cement as well as from raw products offloaded at the wharf. Ash Grove offloads materials for its cement plant and for Stoneway's concrete plant. Ash Grove's product goes out in bulk by truck and rail. It is a dry product. It also goes by pipe next door to Stoneway, where it is blended into concrete. Concrete goes out in mixer trucks from Stoneway.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Ash Grove barges travel down the West Waterway in the navigation channel, to the south wharf. Ash Grove barges do not travel anywhere else in the LDW. Full barges are hauled from Canada (aggregate/lime source) to a buoy in Elliott Bay. Local tug companies haul full barges from Elliott Bay buoy to Ash Grove wharf. Once barge is emptied, it is hauled back out to Elliott Bay. Empty barges are not stored in the LDW. The plant operates 24 hours per day.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Activities are uniform throughout the year; however, sometimes there is a slowdown in production in the winter. Slowdowns are a function of the business and not of any conditions in the LDW. Ash Grove unloads an average of four barges per week at its

location. Two are for Ash Grove. Two are for Stoneway Concrete. During slowdowns, there may be only two barges unloaded per week.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Only feature used is Ash Grove's own pier.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Largest barges have a 23–26 ft draft. When the tide level is at 0 ft MLLW, Ash Grove has 22 ft of water depth at its wharf. So tide timing is required for larger barges.

During fishing season, nets are sometimes tied for a short period of time to Ash Grove structures. The nets can trap barges in. However, if a barge needs to be moved, Ash Grove calls the Tribal contact, and the net is moved. They also noted that prior to the commencement of fishing season, the Tribe alerts the waterway users and tug captains that the net fishing season is starting.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

No dependence on bridges or time of year. Issue with tide noted in Use (E) question.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Enter LDW through West Waterway. Two tugs pull each barge through West Waterway to Ash Grove wharf. Ash Grove is at most downstream end of LDW, so very little transit in LDW.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

SeaSpan barges and Island barges. Larger barges have 23–26 ft draft. Smaller barges have 14 ft draft.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

The wharf has four cable winches to hold barges in place. Two control upstream-downstream movement. Two control east-west movement. Barges are maneuvered in with two tugs using a "three line make up."

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Ash Grove uses Island Tug and Barge, to haul its smaller barges. Its tugs are twin screw tugs. Ash Grove uses Western for to haul its larger barges, which are SeaSpan barges. Western's tugs are Azimuth Stern Drive (ASD) tractors.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not used.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Chains do not drag. They are pulled up.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Some drawings of overwater structures and of the newest hopper were provided to interviewer. SeaSpan barges have their own built in conveyors to move material from barge to upland. For smaller barges, Ash Grove uses its portable hopper (conveyor belt

apparatus). The hopper was recently upgraded in December 2016 to include features that restrict material spillage (wider belt, drip pan).

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Dredging to restore original bathymetry occurred in February 2017. Pre- and post-dredge bathymetric survey maps were provided to interviewer. A 2015 bathymetric survey was also provided.

Prior dredging was in 2013.

Spilled aggregate is dredged from below offloading area and used as product. Dredging is to maintain authorized depth. Dredging is not done to increase depths.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Piles and dolphins on the north finger pier of the south wharf are to be replaced and wrapped (depending upon pile/dolphin). Some old timber piles are being replaced with steel piles. A broken pile is being replaced with steel (for repair) on crib wharf. This work is expected to occur before the end of 2017.

No dredging is planned for north finger pier modifications. Drawings of planned work were provided.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

Some drawings of planned pier work were provided to interviewer.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Noted that LaFarge and CalPortland are other LDW users. Elliott Bay buoy also hold gypsum barges/vessels from Mexico for CertainTeed.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

ADDITIONAL DESCRIPTION

Interview with plant manager, production superintendent, and other on-the-ground staff.

Interview ID:	233
Interviewee:	SeaTac Marine Properties LLC
Subject property(s):	Glacier Marine Services; Delta
Date of Interview:	9/25/2017
Business/organization type:	Transportation logistics and storage
Business physical address(es):	6701 Fox Avenue south
Tax parcel ID#:	0001800104; 0001800128
Approximate river mile:	2.1 E; 2.2 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

SeaTac Marine owns property and overwater structures on the south side of Slip 3 and in the LDW just upstream of Slip 3. SeaTac has owned property for 15 years. Northland Services owned the property before SeaTac Marine. SeaTac Marine ships out building materials (mostly lumber; bulk break) and containers to Alaska. SeaTac unitizes lumber and loads it on barges for Alaska. SeaTac ships out 80,000 tons of building materials annually from four states to Alaska.

Sometimes barges come back full of scrap metal from Alaska and are taken to Seattle Iron and Metals or to Schnitzer Steel in Tacoma.

Material comes in by truck or Union Pacific rail, which services East Marginal Way.

At SeaTac property, SeaTac Marine conducted limited maintenance on containers. Barge maintenance (interior and topside) is conducted on site by mobile contractors from Stabbart Marine, out of Ballard. Stabbart comes to property to do work because it can't bring barges through locks to get to Ballard and because there are not places to lift barges out of water (nor is that efficient).

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

As far upstream as Slip 3. All barges that are not out on jobs are stored at SeaTac's Slip 3 facility. It does not store barges anywhere else in LDW. SeaTac Marine also leases space to other companies to store barges and will be used as a loading facility for other barge companies because they have facilities to offload from rail and to load onto barges. Commerce from Canada comes by rail to be loaded onto barges at SeaTac.

SeaTac sometimes also leases in-water space at dolphins on north side of Slip 3.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Activities are dependent upon commerce and construction season in Alaska. There are four primary geographic areas in Alaska that have different seasons. Southeast Alaska can accept barges all year long. Seward and Anchorage area are iced out part of winter with some year round work (but less so than Southeast Alaska). Prudhoe Bay season is very restricted to summer only. Western Alaska commerce is driven by fishing season. Work is driven by construction in Alaska, so slow Nov–Jan. Interviewee also noted that some Alaska customers draw down inventory by Dec 31 for tax purposes, so Jan–Mar can be slow.

Interviewee noted that Lynden’s work is year round because it ships to Hawaii. SeaTac is looking to expand to California so work would be more year-round.

SeaTac also leases space to others, so use of waterway may depend upon tenants’ activities. Delta Marine had previously leased space in a large building at the south end of the property. Luxury yacht hulls were constructed in this building.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Maintenance dredging of upper turning basin is very important for LDW users, to prevent sediment from coming downstream and making these areas of LDW shallower. Ample berthing areas with deep enough areas are also important. Interviewee noted that there are not many places to store barges. Overwater structure directly upstream of SeaTac is leased by Lynden from company that makes cookie dough. Lynden also moors directly across river from SeaTac, just upstream of First Ave Bridge. Cal Portland also stores barges in Slip 3.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Slip 3 is not tide restricted, but berthing area in main channel of LDW cannot hold barges during very low tides. Barge will bottom out and/or ramp will be too steep for forklift to traverse. Users plan ahead and consult tide predictions. Usually storage of barges is not a problem with available depths, but when barges are loaded down they sit lower in the water, and depths can be more of an issue.

First Avenue Bridge must be open for tugs moving barges to come through. Tug operators plan transits around rush hour bridge closures. Interviewee noted that if bridge gets stuck down, it would be a problem for his business.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Lowest tides restrict use of berthing area in LDW main channel. Slip 3 has been okay with tides. Empty barges sit higher in water than loaded barges, so sometimes loading times are planned according to tides.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down channel to Slip 3 area. No other moorage/resting places in LDW.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Many barges used have about 17-ft draft or shallower. Some are up to 20-ft draft. Most barges were about 250-ft x 75-ft but are getting bigger. Can be 340-ft x 90-ft. Harder to accommodate larger barges in LDW.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Most loading is from land to barges. Sometimes large items can be lifted off of barges. Large transformers have been lifted from barges at SeaTac because they have the facility to access barges. Using water allows commerce to/from Alaska to by-pass Canada (if road/rail were used).

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Island Tug and Barge

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not used by SeaTac Marine. Vessels are tied up. Dolphins are present along concrete docks to protect docks and prevent vessels from making contact with dock.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Bridle chains do not drag by intention. It wears out the bridle chains and slows down the vessels. They should be tied up. The intention is for the chains to be tied up. The vessel is harder to control if the chains drag.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

One bird's eye view air photo map with berthing dimensions was provided. Interviewee noted that Slip 3 is narrow.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No dredging has been conducted in past 15 years. Interviewee noted that Superfund has prevented maintenance dredging, or that they can't pay for planning, design, and permitting if they can't complete work.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Interviewee would like to conduct maintenance dredging. Shallowing berths and a need to use larger (deeper draft) barges affects many waterway users. SeaTac would like to perform maintenance dredging and maintain overwater structures, but has been told to wait for Superfund process/design. Interviewee claims they are unable to go forward with needed activities to keep property (in-water) maintained. Also noted that dolphins, which protect concrete edge of overwater structure/berthing area need repair, but they're unable to do so.

Interviewee notes that ability to refinance or sell property is encumbered by Superfund.

Interviewee also noted that all shallow draft commerce for Alaska occurs out of LDW.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

No documentation because Superfund process and issues with getting permitting have put planning on hold.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Pacific Crane (Paco) loads cranes at Boyer dock, Rick Rasmussen (wire rope) loads winches and gear for customers in LDW, Kelly Ryan/HECO (lease area by Salty's in Elliott Bay, but use LDW), Boyer (RM 2.4), Crowley (not as active in LDW today, but used to own land), Alaska Logistics (use Boyer facilities), JA Jack & Sons, Waste Management (transload in Slip 4)

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

More barges are expected to be in LDW in January than in summer because less work in Alaska. So structure surveys will be harder due to barges blocking structures. Need to coordinate with SeaTac for survey.

ADDITIONAL DESCRIPTION

SeaTac Marine is the newest waterway owner in the allocation group (15 years on LDW). Interviewee (President of SeaTac Marine) expressed need for workable waterway and the struggle for a small business within a Superfund Site. Livelihood is 100 percent tied to the water. Interviewee also expressed concern with four members of LDWG not being waterway users.

Interview ID:	234
Interviewee:	Lafarge Corp
Subject property(s):	Lafarge Corp
Date of Interview:	10/11/2017
Business/organization type:	Aggregates
Business physical address(es):	5400 West Marginal Way SW, Seattle, WA 98106
Tax parcel ID#:	1924049003
Approximate river mile:	1.1 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Unload cement, gypsum, slag, and dredged sediment from barges at two docks at RM 1.0–1.2 West.

Enclosed cement barges are unloaded at the north dock. Open barges of gypsum or sediment are unloaded at the east dock. Handymax ships with slag are offloaded at east dock.

Most barges leave empty. At times glass and gypsum (jet grout) have been loaded onto barges at LaFarge.

Sediment is offloaded/transloaded into rail cars.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Only operate at facility. Barges are not staged anywhere in the LDW. Cement, gypsum, slag-containing vessels are staged and/or loaded in Elliott Bay. Dredged sediment barges move from location of dredging project to LaFarge's east dock when filled. East dock has a lot of space to hold barges. Barges can tie up together so that many can be moored.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Sediment offloading is dependent upon work done in river, only during fish construction windows. Cement, slag, gypsum loading is not seasonal. The north dock almost always has a cement barge (enclosed) at the dock. Frequency of unloading and changing out barges is about one per week or one per 2 weeks.

Slag ships arrive once every couple of months, as needed.

Gypsum barges are at a frequency of a couple per year.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

No other features of importance. Vessels are moored at LaFarge location only.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Slag vessels (Handymax vessels) are lightered in Elliott Bay to lighten their loads. They can moor at the east dock under all tidal conditions because they are not at full capacity. The vessels, when full, can hold 30,000 tons of material. If the east dock were deeper, a fully loaded vessel could moor at the east dock. The dock has enough berthing frontage. Depth is the only constraint for the slag vessels. Slag comes from Japan and Korea (from primary steel production) and is ground into a powder that is used for cement. It's sold to Read Mix companies who blend it with stones to make concrete.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

No. However, slag vessels are lightered into smaller batches so that they can fit at east dock.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Up navigation channel to RM 1.0 to 1.2, west side.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Open barges, Handymax ships, enclosed cement barges (same size as open barges).
Interviewee does not know dimensions.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

None

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Interviewee says that LaFarge uses all tugboat operators. He did not know the names of any of the companies used.

For dredged sediment, tug company is whomever the dredging contractor hires, not LaFarge managed.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

No spuds are used.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

No areas used except LaFarge plant. Interviewee is not aware of positions of bridle chains.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee did not provide drawings.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No. Interviewer noted that 1,000 cy of material was dredged in 2009. Interviewee thought that raw material was recovered after a caisson broke.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No future plans. However, there is a desire to deepen the eastern berth so that fully loaded slag vessels can be berthed. However, there are no plans at this time.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

No

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

No

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Coordination is not necessary, but field staff can contact us ahead of time to find out when fewer vessels will be berthed at the docks (so that they are more visible).

ADDITIONAL DESCRIPTION

No response.

Interview ID:	235
Interviewee:	Pacific Pile and Marine
Subject property(s):	Pacific Pile and Marine (multiple)
Date of Interview:	10/12/2017
Business/organization type:	Construction
Business physical address(es):	614 S Riverside Dr, Seattle, WA 98108
Tax parcel ID#:	7327906755; 7327906645; 7327905350; 7327905725;
Approximate river mile:	2.6 W; 2.55 W; 2.75 W; 2.65 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Lease upland and overwater structures on contiguous parcels from RM 2.5 to 2.9 West. Also occasionally moor and load barges at Boyer Towing (RM 2.55 W) and at Kelly Ryan property at 4.0W. Moor and load inland and ABS barges. Sometimes offload material from barges at site. At time of interview they were offloading concrete from the Colman Dock (downtown Seattle car ferry) reconstruction. Concrete was being jackhammered into smaller pieces to be shipped for recycling. Site also was used as transload facility for sediment dredged from Jorgensen Forge EAA. Best management practices (BMPs) including truck wash facilities, spill aprons, liners, etc. were temporarily added for handling impacted sediment. The site was approved by EPA Region 10 for transloading. However, Pacific Pile does not anticipate acting as a transload facility in the future.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Up to half of the fleet can fit at the RM 2.7W area structures by tying to structures and rafting to one another. Spuds are also sometimes used to store vessels. Can raft two or three deep from shore out to navigation channel. Also go upstream as far as RM 4.0 (to moor at Kelly Ryan property).

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Work is largely dictated by in-water fish windows. Pacific Pile conducts in-water construction work. Fish runs dictate work, and they differ depending upon location.

This winter, Pacific Pile will work in Haines and Valdez, Alaska. Also do some work in Canada out of its Vancouver, B.C. office. The most barges are moored in LDW in late spring and early summer when fish windows are closed.

Work has also been dictated by ongoing remediation projects. Pacific Pile placed the sand/activated carbon mixtures for the pilot projects in the LDW (material was mixed by Cal Portland). It has also been working with Anchor QEA on a pilot project near the Denny outfall (in Elliott Bay). Interviewee noted that Pacific Pile has the appropriate equipment for proper placement of sand and GAC and that sometimes design specifications don't take the appropriate equipment into account. Some specifications for LDW were written for equipment that only works in quiescent, lake-type environments. In a moving river affected by tides, different equipment is needed to ensure proper placement of material and control of turbidity.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Dredging of upper turning basin is important for Pacific Pile. It's berthing areas have silted in such that they only have 5 ft below MLLW. Depth is a problem for all vessels operating upstream of the First Avenue Bridge. In 1998, the subject property was dredged to -10 ft MLLW, but it has silted in by 5 ft in less than 10 years. Shoaling occurs in different places, and shoals move around depending upon flow and vessel movements.

Interviewee noted that climate change impacts will require river deepening, maintenance of shoals and improvements in shoreline structures to address flooding.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Water depth affects vessel operations. Pacific Pile cannot load its barges that have 20-ft drafts when full, at its docks. It will partially load or will move barges to Boyer location (RM 2.55W) where the berth is deeper. Interviewee noted that Boyer tugs all draft 15 ft down, so they are always depth limited. Load lines on barges vary by season (what's allowable for safe travel), and those load line seasonal difference can mean a 500-ton difference in what can be hauled.

Interviewee also noted that increases in recreational use of river and kayakers on river is dangerous. Movement of tugs and heavy equipment can injure kayakers. Additionally, many street ends have been turned in to pocket parks where people launch kayaks. However, there are no trails, so recreational users walk through/near heavy equipment yards and park cars in industrial working areas. There is a lot of

congestion. Pleasure boats from the SP Marina are also problematic because they are often not on the radio and in the same communication lines that commercial users are using. Recreational uses are incompatible with commercial uses of the waterway when they are in close proximity. Interviewee noted that the Port should decide how the river is to be used. Are they meant to promote commercial uses? They seem to be supporting recreational uses in order to mitigate for NRD/Superfund responsibilities.

Vessels are getting larger and there are more of them as freight shipment to Alaska increases. There is a need for more moorage in Puget Sound and deeper berths in LDW. Pacific Pile also stores barges at Seabeck, Washington (in Hood Canal) and Bremerton, Washington.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Water depths are restrictive. Shoaling has occurred, further decreasing use of structures for fully loading barges.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to RM 2.6-2.9, or further upstream to RM 4.0.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Inland and ABS barges. Inland barges can travel to Alaska through inland waters (inside passage, Puget Sound, etc.) but cannot enter open ocean. Barge dimensions vary from 10 ft width x 40 ft length x 5 ft depth to 110 ft width x 400 ft length x 28 ft depth.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring. Sometimes spuds are used at piers. Barges can be rafted two to three wide from dock to edge of navigation channel.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Pacific Pile has a small push tug that can move 24-ft and smaller vessels. It does not have licensed tug operators, so contract with Boyer Towing for jobs needing licensed operators.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are sometimes used for mooring at subject properties.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a. No additional info provided from what was provided in other responses.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee has some old drawings that were emailed to interviewer. There have been no changes to the overwater structures in a long time. Interviewee noted that structures stay intact for a long time in brackish waters.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No. However, it was noted that the berthing area has silted in by 5 ft (to -5 ft MLLW) from the depth to which it was dredged in 1998 (-10 ft MLLW).

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Only immediate plans are related to maintenance, replacement of fender piles. Work might be done under nationwide general permit.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

No documentation available because no concrete plans. Ideally, Pacific Pile would like its berthing area to have a -20 ft MLLW depth to match that of the navigation channel. Interviewee noted that vessels are getting larger and more freight is being shipped to Alaska. Larger barges and equipment are needed to meet demand, so more berthing space, with deeper depths, is needed. Overall, more moorage in Puget Sound is needed. Pacific Pile sometimes takes equipment to Seabeck, Washington (near Hood Canal) and to Bremerton for mooring. Bremerton has large buoys that can hold large vessels.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Boyer Towing was mentioned during interview, both in terms of moorage available at their facility and due to providing towing services.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

January is a good time to view structures because many vessels will be out on jobs. Work is busier when fish windows are open.

ADDITIONAL DESCRIPTION

Pacific Pile leases upland and overwater space at several contiguous properties from RM 2.5 to 2.9 West. Property owners are listed as Cascade Barge, Brackish Properties, Six Fourteen Logistics, Six Twenty Logistics, Hurlen, Cassel Point, and Silver Bay Logging.

Interview ID:	236
Interviewee:	Glacier Northwest, Inc d.b.a. CalPortland
Subject property(s):	Glacier Northwest, Inc. [Glacier NW] (multiple properties) and T-103 (CalPortland)
Date of Interview:	10/23/2017 9:16:18 AM
Business/organization type:	Construction
Business physical address(es):	5975 East Marginal Way S, Seattle, WA 98134
Tax parcel ID#:	1924049029; 1924049075; 7666703440
Approximate river mile:	1.45 W; 1.7 E; 0 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Terminal 103—south side of terminal is leased from the Port of Seattle by Glacier NW and used as an aggregate yard. Barges are unloaded, and aggregate is moved to truck for distribution for particular projects (e.g., third runway at SeaTac airport). Some on-loading of barges may be conducted at T-103 if water delivery is needed for a particular project. Aggregate includes sand, gravel, and quarry rock. Sources of aggregate include Glacier NW Dupont facility. The north side of T-103 and its overwater structure are leased and operated by GC (Kiewit).

At Glacier Bay (RM 1.45W) bulk cement ships (Handysize) are unloaded.

In Slip 2, sand and gravel barges are offloaded. The overwater structure in the waterway, just downstream of Slip 2, is owned by CertainTeed. It is sometimes used by Glacier NW for pneumatic unloading of cement from a cement barge to silos at the concrete plant near Slip 2. At the Slip 2 facility, aggregate (sand and gravel) are mixed with cement and water to make concrete.

Glacier NW also sometimes leases berthing space at SeaTac Marine at 2.15E, just upstream of First Avenue Bridge to tie up their cement barge.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Barges are moved as far upstream as SeaTac Marine facility at 2.15E.

**Are your waterway-dependent activities continuous or intermittent/seasonal in nature?
Please describe the frequency of your operations.**

Work is not seasonal. However, sometimes the summer is busier than the rest of the year. Handysize/cement ships can be unloaded only when it's not raining. (Note: this is because the holds on the ship need to be opened during offloading with the dockside pneumatic offloader at the cement terminal.) So unloading at the cement terminal is weather dependent.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

There are no areas to turn around that can be used by Glacier NW. Therefore, Handysize vessels are pushed in to LDW backwards so they can exit bow-first. They are self-propelled vessels, but are brought in to LDW with tug assist. Adequate navigation channel depths are also important, and the channel is shoaled in some areas south of the Spokane Street Bridge.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Although the berthing area at Glacier Bay is maintained to -35 ft MLLW, its use is tide dependent due to shoaling in the channel on the way to the berth. The berth at the cement terminal is depositional and accumulates sediment. As the berth shoals up, berthing at the dock can become tide dependent. The captain will drop a lead line upon berth to determine if the vessel can remain moored during a given tide. If the captain determines that the depth may not be sufficient to berth the ship during a given tide he/she may order the vessel taken back out to Elliott Bay until tide elevations will again accommodate the vessel. Glacier NW incurs demurrage costs during these times. Berthing is at the discretion of the captain and the anticipated time needed to unload the vessel. The vessels are also sometimes short-loaded when the berthing area is shoaled up and maintenance dredging has not occurred. Short-loaded ships are substantially less efficient and cost effective.

The size of vessel that can visit Glacier NW operations is limited by the width of the opening at the railroad bridge crossing the LDW south of Spokane Street.

There have been depth issues at T-103 in the past. A barge had flipped and spilled rock. It was dredged out in 2005.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Bridge openings for railroad bridge and Spokane Street Bridge are needed at LDW mouth. Movement of bulk cement ships up the waterway are tide dependent due to shoaling in the channel. Berth at Glacier Bay is tide dependent at times depending on how recently maintenance dredging has been performed.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to one of three locations where mooring occurs.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Handymax vessels have a 44,000-ton capacity and measure 170 meters x 28 meters. Aggregate barges have a maximum draft of 16 ft. They vary in length and width. The barges used at Slip 2 typically have a 6,000-ton capacity.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring. Berthing is by tying up to structures.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Foss is used for tug assist of Handymax vessels. Island Tug and Barge is used at Slip 2. Barges at T-103 are supported by Island Tug and Barge and Western Towboat.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

No spuds are used. The barges used do not have spuds.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Bridle chains are not dragged. The barges are pushed.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee emailed copies of drawings showing overwater structures.

From Interviewee via email, 10-23-17:

I am transmitting three more files for your use. You asked for plan and X-section views that could be used by your field team. Attached are Corps permits for dock repair projects that were completed at the Aggregate yard and Concrete Plant in 2006 and 2007 that include drawings that may be helpful in this regard.

I have also attached a file with two drawings for the dock for the cement terminal. The plan view drawing was used in a corps permit to replace some of the fender piles back in 2005. The X-section is from a drawing that was included in the Corps permit to replace all the fender piles in 2016. Unfortunately, I didn't think the plan view in the 2016 version was very good. Please note that the substrate elevation in the x-section is not correct and you should rely upon the dredge permit drawings for bottom elevation in this area."

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Dredge records were provided for all three locations. 2002—Slip 2. 2011—T103. 2016—Glacier Bay.

T-103 is maintained to -14 ft MLLW. A deeper berth would be ideal because some barges have an 18-ft draft. But it is difficult to deepen a berth. A substantial development permit application, with a SEPA review, is required.

Glacier Bay was dredged to -36 ft MLLW in 2005, and 1-ft cap was placed due to sand blast grit and metals (As, Hg) contamination from the adjacent (downstream) former Duwamish Shipyard. The berth was redredged in 2017. Open water disposal was not an allowable option in 2017. The material was subject to waste characterization for upland disposal. The berth at Glacier Bay silts in quickly and needs dredging every few years.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

There are no current plans for upgrades. Shore protection (rip rap) was placed on the south side of Slip 2 a few years ago. Fender piles were replaced on the Glacier Bay dock in 2016.

These were the last modifications performed in the water.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Cannot predict very far in advance when berths will be empty for viewing. The weather affects the use of the Glacier Bay cement terminal. Further, the cement terminal is difficult to access because the Dept. of Homeland Security requires guards to be present on the dock when a cement ship is in berth. A chip card is required for access in/around the dock.

Please contact us when the team plans to be in the water, and may help the team coordinate around ship arrivals.

ADDITIONAL DESCRIPTION

Glacier Northwest, Inc. is interviewee. Glacier Northwest, Inc. does business as CalPortland. Glacier Northwest, Inc. owns two locations, one in Slip 2 and one in Glacier Bay. Glacier Northwest, Inc. leases space at T-103 from the Port.

Interview ID:	237
Interviewee:	J.A. Jack And Sons
Subject property(s):	J.A. Jack And Sons
Date of Interview:	10/25/2017
Business/organization type:	Aggregates
Business physical address(es):	5427 Ohio Ave S, Seattle, WA 98134
Tax parcel ID#:	1924049043
Approximate river mile:	1.15 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

JA Jack offloads open barges of limestone from British Columbia and white rock (lime) from Alaska at RM 1.2E, at a structure made of six dolphins. Product is loaded onto trucks and rail to leave site. Barges leave site empty.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

JA Jack operates only from the mouth to RM 1.2 East. Barges are not moored in any other locations in the LDW.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Spring/summer may be more busy than winter. Lime is used for agricultural purposes (affects seasonality), cement, glass, chicken feed (grit), shingles, joint compound. Barge frequency is an average of three or four per month of limestone from British Columbia quarries. Sometimes a barge from Alaska will bring white rock (limestone), placing the barge frequency up to a max of five per month.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

No features are important to JA Jack. It relies on the tugboat operator to bring in the barges and deal with tides and waterway features. From JA Jack's perspective, the barges show up when they do (similar to railcars).

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Sometimes when tide is too low, the barge cannot come in full upon a low tide. The tug operators check tide predictions before bringing barges in. At a frequency of three to five barges per month, there is usually a broad window to work in.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Barges can't be brought in full when tide is too low. Barge timing is adjusted accordingly. Barges are not short-loaded.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to RM 1.2 E

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Open barges. All limestone barges are the same size (8,700 tons). White rock barges are a bit bigger. Interviewee does not know dimensions.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring. Barges are tied to six-dolphin structure.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Interviewee states that Canadian tugs bring in barges and that they coordinate with LaFarge Marine, which is a Canadian company in same operational group as Imperial Limestone. (Interviewer's note: LaFarge cement interviewee did not mention tug

operators named LaFarge Marine, so this company may be different from the LaFarge Cement company in the LDW.)

For activities involving barges, when and where are spuds used (or are moorings used instead)?

No spuds used

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

No

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

No drawings provided by interviewee.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee does not know about any past dredging events. LDW FS does not list any dredging events for this location.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No in-water plans. All upgrades have been in upland. There are plans to do construction in King County-owned property directly to the north. An old building was torn down recently. However, this work will not include in-water activities.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Coordinate with interviewee for in-water survey. He can advise when no barges will be present.

ADDITIONAL DESCRIPTION

JA Jack has been on LDW since 1950s. Tenant at King County owned parcel at RM 1.2 East. In 2015, ACG Materials of Norman, Oklahoma, purchased J.A. Jack & Sons.

Interview ID:	238
Interviewee:	South Park Marina
Subject property(s):	South Park Marina (multiple)
Date of Interview:	10/27/2017
Business/organization type:	Marina
Business physical address(es):	8604 Dallas Ave S, Seattle, WA 98108
Tax parcel ID#:	2185600070; 0001600001
Approximate river mile:	3.5–3.7 W; 3.45 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

South Park Marina is located at RM 3.4 West. From 1980 to 1981, the marina was rebuilt, including dredging of the marina basin and subsequent dock realignment (supporting documents provided to interview team). Electric and water service was added. Docks and pilings were replaced. The location was a marina prior, since 1970.

Currently, the marina holds 15 live-aboard vessels. Other vessels are weekend-type pleasure boats. No commercial vessels are moored here. However, the marina has been used as a base of operations for scientific survey vessels. The marina contains a boat launch at its downstream end. Launch is in high demand, but it's kept gated off from general, public use, because it can be slippery and hard to use by inexperienced users (not a public park type launch).

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Generally, vessels that moor in South Park Marina do not moor in any other parts of the LDW.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Vessels are in the marina all year long. However, recreational vessels are in and out of the marina more often in the May–Sept boating season than during the rest of the year. Vessels also leave the marina to visit Elliott Bay and other areas during the Christmas boating season.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

The State of Washington runs a program by which a large vessel pumps out waste water from smaller boats and yachts. This program is important to the marina.

The boat launch at the downstream end of South Park Marina is very important. South Park Marina allows restricted access to the ramp for users such as Rick's Master Marine, Wooldridge Boats (an aluminum boat manufacturer in South Park), and vessel operators who want to perform maintenance activities in the South Park Marina yard. South Park Marina provides haul-in haul-out services, and the yard is the only do-it-yourself type of yard around. Vessel owners can perform their own maintenance activities, in accordance with best management practices. However, power washing may be performed only by marina staff. Users can rent professional-grade vacuum sanders.

Other important features include the debris deflector located just upstream of the marina in the T-117 EAA. The deflector was rebuilt during the T-117 EAA work and it is working well. Prior deflectors were not angled correctly and would trap debris, instead of deflect it. Historically, when the deflector was not operational (or not present), large debris including large trees, dead cows, and couches would get trapped in and under the marina docks during large storm events. This was especially problematic when shoaling decreased the depths in the marina.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

The marina has authorized navigation depths of -8 ft MLLW in the inner portions and -12 ft MLLW in the outer portions. Interviewees expressed the need to be allowed to dredge to maintain the marina at these operational depths. The marina has shoaled in some areas and is currently shallower than the authorized depths.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Vessels are dependent upon authorized depths being maintained. The last maintenance dredging event occurred in 1992, only at the downstream end of the marina. A 2003 application to dredge was filed, but dredging did not occur. South Park Marina had planned to dredge in 2017.

Sixty percent of recreational vessels at South Park Marina are sailboats, which are restricted (by mast height) at the First Avenue Bridge and the South Park Bridge when the bridges are closed. The railroad bridge at the mouth of the LDW can also hinder vessel traffic.

When fishing nets are blocking waterway, recreational vessels will have trouble going in and out of LDW, so won't traverse around marina as much when nets are out. There is also an increase in hand-powered (crew, kayaks) vessels in waterway, more recreational users.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to South Park Marina. Do not tie up or berth anywhere else.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Length ranges 10 to 85 ft

Beam ranges 9 to 15 ft

Draft ranges 2.5 to 6 ft

Many sailboats

15 live-aboards

Scientific survey vessels also use marina during in-water work.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

n/a

For activities involving barges, when and where are spuds used (or are moorings used instead)?

n/a

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Drawings were provided.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Documents were provided.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No planned changes. However, some floats may need to be replaced if maintenance dredging occurs. If floats are disassembled for dredging, they may not go back together properly, due to age. When T-117 dredging occurred, outer 120 ft of upstream-most

floats were removed and not replaced. The berthing locations were not made up anywhere else in the marina, so it now has fewer slips.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

South Park Marina would like to dredge to return mudline to authorized elevations. Drawings showing current bathymetry were provided to interviewer.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Rick's Master Marine uses the boat ramp and performs maintenance in the yard.

Wooldridge Boats, an aluminum boat manufacturer located at 96th Ave South, uses the boat ramp to test out vessels on the LDW after a build is completed.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Send an email prior to performing in-water survey.

ADDITIONAL DESCRIPTION

n/a

Interview ID:	239
Interviewee:	Anchor QEA
Subject property(s):	Duwamish Shipyard Inc.
Date of Interview:	11/16/2017
Business/organization type:	Barge shipping and container storage
Business physical address(es):	5658 W Marginal Way SW, Seattle, WA 98106
Tax parcel ID#:	1924049028
Approximate river mile:	1.35 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Duwamish Shipyard Inc. (DSI) leases the upland property and overwater structure at 1.3-1.4 West to Alaska Marine Lines (AML). AML uses the overwater structure for loading of container barges bound for Alaska. Barges also hold items on top of containers, such as vehicles. Forklift trucks drive onto an overwater ramp to access barges/move cargo.

AML also leases the upland property. AML owns the adjacent downstream property.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

AML operates in many parts of the LDW. Lynden is the parent company. Douglas Management is one arm of Lynden. AML and Northland Services are part of the Douglas Management group. However, this interview covers only the DSI property which AML leases.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Activities are fairly constant throughout the year, with a slight increase in the spring. AML ships to Southeast Alaska, which can continue through the winter.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

No other features with the exception of those at the DSI property were noted.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

The current overwater structure is a temporary ramp built over a dilapidated old structure. The ramp extends out from the shore allowing the barges to avoid being tide constrained. However, in the future, when the old structure is removed and the in-water structure is rebuilt to a permanent feature, nearshore deepening will be necessary. The nearshore is tide constrained for large barges. Interviewee did not note any issues with the authorized channel depth.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Not currently. DSI property is downstream of First Avenue and South Park Bridges. Interviewee noted that railroad bridge at Harbor Island is typically open and that the swing bridge (Spokane Street Bridge) is not a detriment to vessel traffic.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to RM 1.3 W

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Container-type barges. Dimensions unknown by interviewee.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Vessels tie up to structure near ramp. Forklift trucks can access ramp to load vessel. AML property to the north has a similar ramp.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Interviewee did not provide names of specific tug companies; stated that many are used. Noted that tugs are twin/double screw engines as opposed to cycloidal.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not used at DSI.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Interviewee not aware of chain dragging.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee does not have drawings of the structures.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee provided past dredge information included in a figure (map) and a table for the remedial investigation being written for site. DSI site is under Ecology order for uplands and in-water contamination.

From a 12-11-17 email from the interviewee:

“Dredging – information taken from Anchor QEA’s Final RI Report 2017

Figure 3-7 (attached) from the RI shows dredging history.

Table 3-2 (attached) from the RI provided historical dredging summary with actual dredged volumes and disposal sites.

Brief summary of known dredging events:

- In 1986 and 1993 dredging completed to a depth of -35 ft MLLW.
- In 2005 dredging completed to -36 ft MLLW, and 1 ft of clean sand cap material placed, final elevation of -35 ft MLLW
- In 2017 dredging completed to -34 ft MLLW (with 1-ft overdredge)

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Current structure is dilapidated. There are plans to remove it, as well as the old marine railways in place. Nearshore deepening and sand blast grit removal is planned. A temporary ramp spans the old structure and provides one berthing location. Future plans are for two berthing locations with ramps supported by new piles and dolphins to tie up barges.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

No documentation of future plans provided.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Interviewee is also consultant for Ash Grove cement, Crowley (Slip 4), and AML. Interviewee provided info on Slip 4 and offered to provide contacts for various AML locations along LDW.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to

be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

No coordination with interviewee needed. Interviewee does not have information on barge schedule.

ADDITIONAL DESCRIPTION

DSI owns the property at 1.3 to 1.4 West. It is leased to Alaska Marine Lines (AML). A consultant with Anchor QEA was the designated interviewee.

Interview ID:	240
Interviewee:	Anchor QEA
Subject property(s):	Crowley Marine Services (Waste Management)
Date of Interview:	11/16/2017
Business/organization type:	Transloading facility
Business physical address(es):	7400 8th Ave S, Seattle, WA 98108-3460
Tax parcel ID#:	2136200641
Approximate river mile:	2.8 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Location is used as a transload facility for Waste Management (tenant). Upland site has rail spurs for loading materials and transporting to Eastern Washington by rail. Site is at mouth of Slip 4 on north side of slip, outside of Slip 4 EAA.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Interview refers to site itself, not to individual barge/tug operators who bring materials to the site. Each vessel operator manages his own transport, independent of operations of upland site (run by Waste Management). Interview is listed under Crowley (company name) as Anchor QEA (interviewee) represents Crowley at this property.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Not seasonal

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

n/a

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Outer portion/mouth of berth was dredged in near past. Inner portion is shallow and needs dredging, is tide constrained. Proximity to Slip 4 EAA cap is also a constraint.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Inner portion is tide constrained.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

n/a

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

n/a. Typically barges. Sediment as well as other materials (e.g., construction debris) can be transloaded at site.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

There is a suitable bulkhead/pier for vessels to tie to.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

n/a

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not required, but vessel operators determine their best method to secure vessels for transloading.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interview provided two sets of drawings (dated 2014 and 1982) of the shoreline structure via a 12-11-17 email after the interview.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee provided this information in a 12-11-17 email after the interview:

- “- Information taken from SLR’s RI FS Work Plan dated October 2012
- In 1981 Army Corps of Engineers dredged approximately 85,000 cy of sediment from Slip 4 to -15’
- In 1996 nearly 11,000 cy of sediment was dredged from the southwestern part of Slip 4, nearest the 8th Avenue Terminal, to maintain navigable access to the pier.”

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property’s shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Pier and bulkhead are in good condition. No changes planned. Maintenance dredging is needed in inner portion of site.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

No coordination with interviewee needed.

ADDITIONAL DESCRIPTION

A consultant with Anchor QEA was the designated interviewee. He is an environmental consultant to Crowley, former owner of DeNovo property at mouth of Slip 4. Waste Management is tenant of property and uses it as a transload facility with rail service.

Interview ID:	241
Interviewee:	Boyer Towing Inc.
Subject property(s):	Boyer Towing Inc. (multiple)
Date of Interview:	11/17/2017
Business/organization type:	Tug and barge
Business physical address(es):	7318 4th Ave S, Seattle, WA 98108
Tax parcel ID#:	6871200620; 6871200210; 7327906685; 6871200100
Approximate river mile:	2.3 W; 2.4 W; 2.55 W; 2.45 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Moorage of cranes and barges from 2.25 to 2.55 West. Upland properties comprise a freight terminal for loading containers, lumber, sheet rock, cars, and other cargo for transport to Alaska. Almost all work is shipping to Alaska, although Boyer Logistics also handles materials for local jobs such as pilings for the Colman Dock (downtown Seattle WDOT car ferry) construction. Crane barges are also moored. Freight is loaded at this location, and containers are packed/unpacked in a warehouse behind the office. Freight terminal is fenced with access only to TWIC-authorized individuals. Freight to/from terminal by truck.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Most Boyer Towing vessels travel as far upstream as RM 2.55 West. Boyer also sometimes leases space at the Silver Bay Logging wharf (2.9W); it shares with Pacific Pile.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Activities are mostly continuous, although there may be less traffic to Alaska, or more barges in the LDW, in the winter.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Boyer Logistics uses piers and dolphins to tie up barges and tugboats. Several structures are located from RM 2.25 W to 2.55W. Navigable depths are also important, and the navigation channel has been shoaling recently. Interviewee suspects that sand placed at Boeing Plant 2 EAA is moving downstream and shoaling the navigation channel. Interviewee notes that the sand bars shift often and that the nearshore area is eroding and deepening while the outer berthing areas and navigation channel are shoaling.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Depths constrain activities. If tide is too low, then larger barges are tied off of smaller barges tied to shoreline structures. Navigation channel depth is constrained. Channel is not being maintained at authorized depth. Boyer Logistics locations are authorized to be maintained at -10 ft MLLW, and Boyer has been able to dispose of dredged sediment in open water in the recent past (last event was in 2014). It needs to be able to continue to maintain these depths.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Water depths can constrain vessel operations. Vessel operations are also dependent upon a shortage of available industrial berthing spaces. Boyer Logistics also has mooring space, at buoys, in Port Orchard (four barges) and Port Madison (two barges). However, change in land uses in those areas to luxury waterfront homes is causing barge mooring to be less desirable. Buoys for mooring have been present since the 1940s, prior to construction of homes. Shortage of industrial mooring spaces is a concern.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to structures at RM 2.25 to 2.55 or to leased location at Silver Bay Logging. No other mooring locations typically used.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Crane barges, tugboats, flat deck barges. Larger boats have a 16-ft draft. Draft can be 18 ft when the barge is fully loaded.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Anchoring was not noted. Vessels are tied to dolphins and overwater structures or to one another.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

Boyer Logistics operates its own tugboats to tow its own barges. Interviewee noted that tugs are the “conventional” type (not tractor tugs). Boyer also tows for Pacific Pile (adjacent upstream neighbor).

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Boyer typically does not hire other tugboat operators. However, on occasion when a very large load is to be hauled, it might use Western Towboat.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Sometimes the crane barges are moored with spuds. If a barge is loaded from the beach, it is secured with spuds.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Interviewee did not note whether chains are dragged. Barges are not staged or anchored at any locations other than those noted previously (at Boyer Logistics terminal).

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Drawings were not available.

Concrete structure at 2.45West was replaced about 10 years ago with steel structure. Footprint did not change.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Dredge records were not available. Site was last dredged in 2014, and sediment was suitable for open water disposal.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Interviewee would like to remove several creosote-treated timber piles at the downstream end of owned property and in the "marina." Past attempts to remove several piles at once were not permitted due to substantial in-water changes. Therefore, interviewee plans to replace piles 1 or 2 at a time as needed, when replacement is needed for maintenance purposes. It's easier for work to be permitted when it is required for maintenance. Interviewee also noted that the marina is no longer used for recreational vessels. A past tenant had a 35-year lease and constructed the marina. That lease is up, and the debris left on the beach and in the upland has been removed by interviewee. He would like to remove the marina structure and its piles and rebuild a structure more suited to barge berthing.

Interviewee also noted that Boyer Towing and Pacific Pile removed derelict vessel left at former Hurlen Construction location (just upstream of Boyer Towing).

No major changes to other structures are planned.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

No other interviewees suggested.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

The interviewee may be contacted.

ADDITIONAL DESCRIPTION

Barges and tugs shipping freight to Alaska. Freight terminal at RM 2.25 to 2.55 West. Interviewee desired to communicate the following opinions: 1. Navigation channel depths need to be maintained. Channel is shoaled. 2. Spudding needs to be allowed in the LDW. 3. Boyer towing locations shouldn't be capped. They need to be suitable for barge/tug traffic. 4. Boyer needs to be able to continue to maintain berthing depths.

Interview ID:	242
Interviewee:	Crowley Marine Services
Subject property(s):	Crowley Marine Services
Date of Interview:	11/29/2017
Business/organization type:	Tug and barge
Business physical address(es):	1102 S.W. Massachusetts St., Seattle, WA 98134
Tax parcel ID#:	NA – offsite vessel operator
Approximate river mile:	NA

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Crowley provides ship assist services. However, it is not currently very active in the LDW. It has no current contracts in the LDW. The work ebbs and flows.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Depends on client needs.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Dependent upon contracts and available work, when clients need ship assist. Work contracts vary greatly, but not seasonally.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

n/a. Tugs are based in Elliott Bay and north end of Harbor Island.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

n/a. Interviewee did not know of any physical constraints except typically unnavigated areas including Trotsky Inlet and west side of Kellogg Island. However, interviewee is

director of sustainability for Crowley and doesn't have specific knowledge of marine operations.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Vessels need 18–21 ft of draft. No other constraints known by interviewee.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Varies. Client dependent.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Tugs. Azimuth stern drive vessels or single stern propeller design (with movable rudder) may be used in LDW and Elliott Bay. Tractor style tugs with Voith Schneider propulsion systems ("egg beater" style props near bow) are used in Elliott Bay, but not in the LDW.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Varies by client.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

Various, but no current contracts in LDW.

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

n/a

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Crowley does not own any spud barges. Interviewee did not have specific knowledge of clients who use spuds.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Interviewee does not know how low bridle chains are dragged, but noted that when tug is “hipped” up to vessel that bridle is not used for towing and may be in the water.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

n/a. Crowley does not have facilities in the LDW.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

n/a. Crowley does not have facilities in the LDW.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property’s shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

n/a. Crowley does not have facilities in the LDW.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a. Crowley does not have facilities in the LDW.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

n/a

ADDITIONAL DESCRIPTION

Crowley is the former owner of the 8th Ave property on Slip 4, but the interviewee was unable to discuss future uses of the property. Instead, the interview focused on Crowley's tug assist services in the LDW.

Interview ID:	243
Interviewee:	Duwamish Marine Center/ Filter Engineering
Subject property(s):	Duwamish Marine Center/ Filter Engineering/ Samson Tug and Barge
Date of Interview:	11/30/2017
Business/organization type:	Tug and barge operations
Business physical address(es):	6365 1st Avenue South, Seattle, WA 98108
Tax parcel ID#:	5367204565
Approximate river mile:	1.8 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Samson Tug and Barge uses the overwater structures from the mouth of Slip 2 to the downstream side of the First Avenue Bridge (RM 1.8 to 2.0 E) to load and store barges for transport to Alaska. There are five individual structures with the upstream-most being a boathouse structure and the downstream-most being in the mouth (south shore) of Slip 2.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

The Slip 2 mouth dock is used for loading barges for transport to Alaska. Smaller docks are also used for offloading barges with sand/gravel and construction equipment. The larger, downstream-most docks are used most often. One of the smaller docks has a crane, so it's used when a crane is needed for lifting items. No other operations elsewhere in LDW.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Activity is constant throughout the year with most activity during the Alaska fishing season. There is no slack time where there is no traffic.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

None noted other than structures at property (RM 1.8 to 2.0 E).

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

At low tide, barges cannot be fully loaded. Work timing has to be adjusted or barges are short loaded.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

No constraints other than tides.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Down navigation channel to RM 1.8-2.0 E.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Barges of 400-ft length or less.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

No anchoring.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

Samson has one tugboat; do not tow others' vessels.

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Use Samson's one tug and hire out to other operators including Island, DeForge Towing, and two or three others (not named). Some construction company tugs are also used, and they sometimes use subject property structures for offloading. They sometimes use the crane pier for offloading equipment.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not used. Barges are always tied up.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Interviewee does not know.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee checked his files and does not have any drawings of the structures.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee has no records of maintenance dredging activities. Dredging has occurred in the past, but he does not know when nor to what depth.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No plans for maintenance on structures. Interviewee would like to perform maintenance dredging, but he notes that acquiring a permit is difficult.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

None provided

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Coordinate with interviewee.

ADDITIONAL DESCRIPTION

Interview was Filter Engineering. Samson Tug and Barge is the tenant at the property located from the mouth of Slip 2 to the downstream side of the First Avenue Bridge RM 1.8 to 2.0 E. Site is also known as Duwamish Marine Center.

Interview ID:	244
Interviewee:	State of Washington Department of Transportation
Subject property(s):	First Avenue Bridge
Date of Interview:	12/5/2017
Business/organization type:	Transportation infrastructure
Business physical address(es):	NA
Tax parcel ID#:	NA
Approximate river mile:	2.1

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

The First Avenue Bridge has two spans. The northbound bridge was constructed between 1953 and 1956 as a semi-floating bascule bridge with two semi-floating cellular piers of reinforced concrete and connected on the Duwamish River bottom by two reinforced-concrete struts. The northbound bridge received a mechanical and electrical upgrade in 1998. The southbound bridge was constructed between 1993 and 1996 as a bascule bridge. It has a rigid pile support foundation. Piles are exposed above the mudline. The southbound bridge also has shafts that support a fendering system. WDOT also owns land adjacent to the LDW. It has a maintenance yard and small structures on it.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

n/a

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

n/a

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

The bridge piers also have pier protection structures in the LDW. They protect the piers from ship contact. The protection structures can flex under the mudline.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

n/a

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

n/a

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

n/a

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

n/a

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

n/a

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

n/a

For activities involving barges, when and where are spuds used (or are moorings used instead)?

n/a

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

No drawings provided.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

n/a

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No ongoing or planned maintenance. Both spans are inspected every 24 months above water and every 60 months below water. The struts are inspected by water being pumped into the structure to affect buoyancy. The structures can also be inspected by diver.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Interviewee noted the Assistant Regional Administrator for WDOT can answer more questions.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

n/a

ADDITIONAL DESCRIPTION

Interviewee is the state bridge program manager. The First Avenue Bridge, which crosses the LDW at RM 2.0-2.1, is part of the State's inventory.

Interview ID:	245
Interviewee:	Alaska Marine Lines/ Northland Services
Subject property(s):	Alaska Marine Lines/ Northland Services (multiple)
Date of Interview:	12/4/2017
Business/organization type:	Barge shipping
Business physical address(es):	6700 W Marginal Way SW, Terminal 115, Seattle, WA 98106
Tax parcel ID#:	2924049090; 6871200035; 1924049026; 1924049103; 5367202505
Approximate river mile:	2.15 W; 2.25 W; 1.3 W; 0.6–0.9 W; 1.5–2.0 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

AML operates at five named yards. Yard 1 is at 5600 West Marginal, RM 1.2 to 1.4 W. This includes a lease at the Duwamish Shipyard. Yard 1 has 2 berths used to load barges traveling to Southeast Alaska. Yard 2 is at 7100 West Marginal, RM 2.1 to 2.2 W, under the First Ave Bridge, and owned under AML-affiliate 7100 1st Ave Seattle, LLC. It is a maintenance facility and lay berth. However, a small amount of loading can occur at Yard 2. Yards 3 and 4 are upland/non-waterfront locations that were not discussed during the interview. Yard 5 is Terminal 115. It has four berths used to load barges for transit to Central Alaska (and westward) and Hawaii, as well as tug dolphins used for small barge berthing only.

Materials loaded onto barges include break bulk, containers, rolling stock (heavy equipment, like construction tractors, that are too large to fit in a container; vehicles are put in containers), compressed (e.g., CNG) cylinders, and refrigerated containers.

AML can also tie up at Fox dolphins (RM 2.3E) and at the south end of Kellogg Island. There is no land access at these locations. They are lay berths.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

AML operates over about half of the LDW from RM 2.65 downstream.

**Are your waterway-dependent activities continuous or intermittent/seasonal in nature?
Please describe the frequency of your operations.**

620 South Riverside—winter storage of non-motorized barges and landing craft (barges that can get pushed onto a beach to be unloaded in Alaska). These barges go back to Alaska in March and stay until Oct/Nov.

Yard 1—year-round use with a fixed number of barges (two per week). Operations are throughout the year as shipping is to Southeast Alaska. Every Wednesday and Friday, an outbound loaded barge leaves Yard 1. It takes 3 days to get from Seattle to Ketchikan.

Yard 2—lay berth, only loads one barge about every year. Use for storage more in winter. Barges come “home to roost” in winter.

Yard 5, T-115—year-round use with greater intensity in summer (March–Sept)

Fox dolphins—lay berth with no land access, so more storage of barges in winter.

Generally, work is year-round but the volume increases in the summer. Western Alaska deliveries are in summer only. Some fleet stays in Alaska all year long. Many vessels are constantly in motion. Some moorage of barges occurs outside of LDW (such as in Sinclair Inlet).

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

Berths noted in other responses are of importance.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

At the Fox Ave and Kellogg Island lay berths, barges are tied empty (never loaded) due to draft restrictions and wind (a loaded barge is like a sail). The Kellogg Island berth cannot accommodate a draft greater than 7 ft, so barges must be empty. Berth 1, the upstream-most berth at T-115, is tide constrained. Loading needs to be coordinated with tides. Interviewee does not know other constraints to transit. Interviewee noted that tug operators would know this.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Tides in some locations.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

n/a

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Barges (all non-motorized) range in length from 230 ft to 420 ft with several size variations in between. Most used lengths are 320, 340, 360, 380, and 420 ft and there are four barge sizes within each of these length categories. Drafts range from 13 to 24 ft. The larger barges have a 15,000 ton capacity.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

Anchoring occurs outside of the LDW at the West Seattle (Elliott Bay) buoy and at Pier 34 (north side of Harbor Island). Rail barges (container on racks above rail spurs that hold loaded railcars) are loaded here with railcars. The containers are loaded at T-115. Pier 34 is the only location where the railcars can be loaded and unloaded.

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

AML uses Western Towboat for all of its towing.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

No spuds used.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what

conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

Stowing/staging already addressed. Bridle chains are not drug.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

No drawings provided. At T-115, Berth 1 is on piles that are free standing in the water. The ramp rests on the barge during loading. A structure that can be filled with air pushes up the ramp to lift it off the barge as the loaded barge is moved away from the shore. Other berths at T-115 have ramps supported by A-frames on pile caps on shore. Ramps for driving fork lifts onto barges extend from shore to barge and are supported/raised/lowered by A-frame.

At Berth 1, barges can be tied up two abreast. The shore is inset relative to the other berths, allowing room for two barges side-by-side.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

Dredging has been performed at Port facility (T-115 only). Interviewee advised getting info from Port. Further maintenance dredging at all berths may be required.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

Planned work is maintenance on ramps only. No in-water work planned.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

n/a

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Coordinate with interviewee. There is a lot of barge movement going on during loading. Loading occurs 24 hours per day (night shifts). However, work/traffic is less busy in winter, but more barges will be stowed at structures/blocking view of structures. Barge maintenance occurs in winter.

ADDITIONAL DESCRIPTION

Northland is a Port tenant at T-115 and at the mooring location at the south end of Kellogg Island. AML has a moorage agreement with Spectral Crane & Marine, LLC (Pacific Pile) at the 620 South Riverside lay berth and also moors at the Fox berth (RM 2.3E). AML owns Yard 1 and Yard 2 at 5600 W Marginal and 7100 W Marginal, respectively. AML is also a tenant at the Duwamish Shipyard just adjacent to Yard 1.

Interview ID:	246
Interviewee:	Seattle Iron & Metals
Subject property(s):	Seattle Iron & Metals
Date of Interview:	12/14/2017
Business/organization type:	Metals recycling
Business physical address(es):	601 S Myrtle St, Seattle, WA 98108
Tax parcel ID#:	2136200706
Approximate river mile:	2.4 E

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

RM 2.4 to 2.5 East, just upstream of Myrtle embayment, between Myrtle and Othello Streets. Two overwater structures. North structure is not used for water-dependent uses. It is use for turning around vehicles that drop off scrap metal. The mapped berthing area next to this structure is not used for berthing. The south structure is used for unloading scrap metal from barges. It has a large swing crane that is out of service. There is no export via water from this location. All barges leave empty.

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

Interviewee does not operate vessels. So the water-related operations are limited to the south dock at RM 2.5 E.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

There is some seasonality. There is less activity in the winter.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

None noted. Interviewee does not operate vessels.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

Some tidal constraints during very low tides. Have been close to grounding when tide is very low and barge is heavily loaded. However, interviewee noted that there is not a shoaling issue and no need for ongoing maintenance dredging.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Interviewee does not operate vessels.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

n/a

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Barges that bring scrap metal to interviewee's structure have about a 10–11 ft draft.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

n/a

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Interviewee notes that the following tugboat companies bring barges to subject property: Western Towboat, Island, Boyer.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

Spuds are not used. Barges are tied to structure.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a. Interviewee does not operate vessels.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

Interviewee provided memo describing planned maintenance work.

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No maintenance dredging performed since at least 1999 when Seattle Iron and Metals purchased property.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

The south dock will be undergoing two phases of permitted maintenance work involving pile, stringer, and deck replacement. The footprint and function of the structure will remain the same. The work is in-kind repairs. Work is anticipated to start in late 2018 and go through the fish window, into early 2019. The work is dependent upon the acquisition of a federal permit.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

Memo describing planned work was provided by interviewee.

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

No tenants. No users tie up to structures other than those offloading scrap at south dock.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

ADDITIONAL DESCRIPTION

Phone interview with a representative from Seattle Iron and Metals and a consultant (Floyd|Snider).

Interview ID:	247
Interviewee:	General Recycling of Washington
Subject property(s):	General Recycling of Washington (multiple)
Date of Interview:	12/20/2017
Business/organization type:	Scrap metal recycling
Business physical address(es):	4260 W. Marginal Way S.W, Seattle, WA, 98106
Tax parcel ID#:	7666703540; 7666703630
Approximate river mile:	0.25 W; 0.25 W

DESCRIPTION OF WATERWAY-DEPENDENT USES

Please provide a general description of your current activities that are dependent on use of the waterway (e.g., vessel operations, waterfront facility operations).

Scrap metal unloading yard at RM 0.2 to 0.4 West at former Port Terminal 105. Birmingham Steel purchased land from the Port of Seattle in the mid-1990s. Nucor Corporation acquired the Birmingham assets out of bankruptcy and General Recycling of Washington was formed to continue operations at the West Marginal Property. The yard has two docks. The north dock has two berths. The south dock is in disrepair and is not currently used. The north dock is of steel construction/steel piles. The only timber parts are the whalers. Scrap metal comes from Richmond Recycling in Vancouver (typically) by barge. Oceangoing large vessels also moor at the dock to unload silica magnesium (raw material for steel making) once per quarter. Large oceangoing vessels are also sometimes loaded with billets (semi-finished product).

Over what area of the entire LDW (e.g., between what approximate river miles) do you typically operate? If applicable, indicate whether your activities are constrained to a particular side of the waterway (the interview team will utilize the attached maps to prepare sketches and make notes, as needed).

General recycling barges/ships do not travel any further upstream into LDW than T-105. They currently do not receive barges from any scrap yards or other locations on the LDW.

Are your waterway-dependent activities continuous or intermittent/seasonal in nature? Please describe the frequency of your operations.

Operations are dependent upon melt schedule of mill. One scrap metal barge arrives about per week, though there are typically not more than four barges received each month.

Briefly describe any waterway features of importance to your operations (e.g., turning basins, actual or authorized navigation and berthing areas and depths, wharves, piers, pilings, dolphins, or other structures).

No features noted.

Briefly describe any physical constraints that affect your operations (e.g., tidal conditions, waterway width or depth).

The dock is limited by the type of vessel that can moor there. The large oceangoing vessels are only brought in during daytime high tides, by harbor master who determines when ships can come in. Barges are not depth constrained. Interviewee noted a limit of 31 feet at shallowest point. General Recycling would like to deepen berth in the future, but there are no immediate plans.

INFORMATION SPECIFIC TO OPERATION OF VESSELS

Are your vessel operations dependent on water depths or tide levels, time of year, or bridges? If yes, please describe.

Barges are not dependent upon these features. Large vessels are constrained by high tides. The dock has room for two barges, so there are typically no crowding issues.

Please describe your typical transit route(s) (the interview team will sketch on the attached waterway overview map, as needed).

Vessels do not travel upstream in LDW beyond T-105 yard to RM 0.2 to 0.4 West. Barges leave LDW empty and return to scrap metal source in Canada, on a continual round-trip circuit.

Please describe the vessel(s) that you typically operate on the LDW (i.e., type, beam, length, draft, capacity, horsepower). We are interested in approximate number of vessels operated and frequency of each type of vessel traffic (i.e., per week, month, or year).

Barges are typically 272 ft in length, 68 ft wide, 16 ft draft, with 6,000 ton capacity.

Please describe other relevant operational characteristics, including berthing and anchoring. We are interested in learning about typical vessel maneuvering, including in and around piers.

n/a

If you are a tugboat operator, please describe the companies/facilities that you typically serve.

n/a

If your operations are supported by tugboat operators, which operator(s) do you typically use for support?

Western Towboat and Island Tug/Barge are used to bring in vessels. Island Tug/Barge will also turn barges so they can be unloaded evenly without listing in the water. In exchange, General Recycling lets Island sometimes moor its customers' barges at the subject dock when necessary for moving barges around.

For activities involving barges, when and where are spuds used (or are moorings used instead)?

No. Spuds are not used.

For activities involving barges, identify areas of the waterway (if any) where barges are towed and staged/anchored. Also identify areas where barges are pushed. Is it typical to allow bow-mounted bridle chains to be lowered and dragged? If so, note under what conditions this occurs, and within what areas of the LDW. (The interview team will sketch on the attached waterway overview map, as needed.)

n/a. Interviewees don't move/operate vessels. Interviewees operate upland property.

FACILITY-SPECIFIC INFORMATION

Are as-built drawings, design plans/profiles, or other schematics illustrating the structural configuration of your waterfront or overwater structures (e.g., piers, wharves, bulkheads) available for copying? If yes, the interview team would appreciate noting the general types of documents that are available and any follow-up actions that may be needed to obtain them.

No

Are dredge records for establishment and maintenance of berthing areas, including authorized dredge depths and limits, available for copying? If yes, the interview team would appreciate the opportunity to note documents that are available and any follow-up actions that may be needed to obtain them.

No maintenance dredging has occurred since Nucor has owned property.

FUTURE ACTIVITIES

Please describe any planned facility/infrastructure maintenance, development or improvement projects, operational modifications, or other plans that will affect your

property's shoreline or affect your future use of the waterway, both within the short term (2 to 5 years) and the longer term (more than 5 years).

No immediate plans other than typical maintenance on north dock. Preventative maintenance. Dock is constructed of metal/steel posts in concrete gussets. Wood whalers were replaced recently. General Recycling is in the process of obtaining a 5-year permit allowing standard maintenance/upkeep. The south dock is in disrepair and is not used for any purposes. Its mapped berthing area is not currently used for berthing. There is a desire to improve this dock but no immediate plans.

Is documentation available regarding future plans? We would appreciate discussing these plans with you, and if possible, obtaining copies if they are available.

n/a

FOLLOW-UP ACTIONS

Based on the discussion of topics and questions listed above, please let us know if there are additional tenants or other waterway users that we should contact.

Island Tug and Barge will moor customer barges in subject property when needed for shuttling/moving barges. This is in exchange for Island "spinning" barges being unloaded. So that barges don't list while being unloaded unevenly, tugs will turn them through the unloading process.

For waterfront facilities with in-water structures, we would be grateful if we could arrange a brief follow-up visit to document the type, location, and general condition of the structure(s). Our intent is to conduct this assessment using a small vessel on the LDW, and to perform all observations from a safe working distance to avoid interrupting facility operations, unless otherwise arranged in advance. You would not be required to be present during this survey, although you will be notified in advance when it will occur. Also, could you please provide a facility contact with whom the in-water team can coordinate further, prior to conducting the assessment.

Coordinate with yard day supervisor.

ADDITIONAL DESCRIPTION

General Recycling's mill property is not located on the LDW. It operates a barge unloading yard on the LDW at the former Port Terminal 105.

Table A-1. Completed Responses by Telephone or Email

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
Waterway-Dependent Users			
Port of Seattle T-102 (Arrow Launch Service)	7666701220	0 E	Contact indicated that they use the Port of Seattle's docks at Harbor Island, but do not go upstream beyond Harbor Island. Their company services ships in Elliott Bay or across the water in Manchester. They generally operate workboats and crew boats. The company has stevedores and pilots ships back and forth from Harbor Island out of the Lower Duwamish Waterway (LDW). Contact indicated that the Harbor Safety Committee may have additional information of traffic in the LDW. Contact declined an in-person interview due to lack of use of the LDW.
Port of Seattle T-102 (Western Marine Construction, Inc.)	7666701220	0 E	Contact indicated that their operations are dependent on Alaska operations. They load/unload freight and cargo in LDW; however, they do not have physical structures along the waterway. Contact indicated that their operations did not warrant an interview, as the infrastructure that they use in the LDW is owned by other tenants that we will be/have contacted.
Ash Grove Cement Co. (Stoneway Concrete)	7666700350	0.2 E	Contact indicated Stoneway Concrete has very little to no use of the waterway and no future plans to develop/increase waterway use. They currently get deliveries of gravel by barge through Ash Grove and unload approximately twice per week. Contact indicated Stoneway Concrete did not need to participate in a face-to-face interview.
Port of Seattle T-107 including submerged lands and Kellogg Island mooring tenants (Trac Intermodal [ConGlobal], southern area tenant)	1924049103	0.6–0.9 W	Contact indicated that T-107 tenant ConGlobal does not conduct waterway use activities. They are a transloading facility for roadway transport. Operations at this property are not associated with any water-related activities except for the discharge of stormwater, which is permitted under its Industrial Stormwater General NPDES Permit. Intermodal equipment is received and dispatched to and from the leased area overland via the City's street network. The leased area is

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
			not improved with cranes, piers, berthing areas or pilings that would permit loading or offloading from the Lease Area to the vessels or barges in the LDW. ConGlobal currently has no plans to make improvements that would allow for such activity.
Portfolio Management Div (Federal Center South)	3573200975	0.7 E	Contact said that the federal building has a small dock structure where federal boats occasionally dock.
Rainier Petroleum Corporation (Owned by Maxim) (Rainier Petroleum Corporation)	5367204160	2.1 E	Contact said that the company has very minimal waterway use in the LDW at their River St. facility. They have a small boathouse and a self-propelled vessel, which provides lubricants to deep draft vessels (cruise ships, tankers, etc.). Contact said they have a small (~2,000 square-foot) upland property. They use dolphins and obtain fuel at the pier on the north end of Harbor Island. Contact declined to participate in an in-person interview.
Westcore River Street LLC (Westcore River Building)	5367204100	2.1 E	Contact representing the real estate for Westcore River Building indicated that they lease the property to Open Source, a furniture vendor. Open Source does not use the waterway. Westcore Properties leases moorage in front of the property to SeaTac Marine, which docks a large tugboat there. Contact indicated they have no plans for property improvement along the waterway and declined an in-person interview.
Individual Owner (Industrial Container Services)	2924049030	2.25 W	Contact declined an interview. They did indicate the company does not use the waterway and does not have future development plans for the waterway.
First South Properties LLC (Cedar Grove Composting, Inc.)	2924049043	2.9 E	Contact indicated that they do not operate ships or have overwater structures associated with their property. They have no plans to develop along the waterway. Contact declined to participate in an interview.
Silver Bay Logging Inc. (Silver Bay Waterfront Site)	7327903645	2.9 W	Contact representing the real estate for Silver Bay Logging indicated property is for sale and is not in use. Interviews with other parties

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
[Formerly Silver Bay Logging property])			indicates the waterfront structures are occasionally used for barge moorage by others (Pacific Pile and Marine).
Container Properties LLC (Container Properties LLC)	5422600010	4.1 E	Contact said that the current operations at the site do not involve waterway use. The whole site is completely paved and is occupied by Insurance Auto Auctions where they store damaged vehicles before they are auctioned off. Insurance Auto Auctions lease is ending soon and will likely be moving operations early 2018—no information on potential new tenants. Container Properties LLC is currently undergoing an EPA RCRA action. In 3–5 years, they will be completing a habitat rehabilitation project to regrade the slope of the bank from near vertical to 4.5 or 5:1 slope and vegetate (riparian habitat down to shelf habitat). All current in water structures will be removed and not replaced. The anticipated future use of the property will be for land-based operations or storage—no waterway use.
Boeing (Boeing Developmental Center)	5624201032	4.3 E	<p>The Boeing Developmental Center uses the adjacent slip (Slip 6) every 2–4 years to bring in large parts via barge. Intermittent use for confidential business activities. Associated materials/equipment are sometimes loaded on barges at Delta Marine across the river.</p> <p>There are two bridges associated with the Developmental Center. The north bridge may be removed. The south bridge will remain in place. Some of the pilings will be replaced this fall as part of routine maintenance.</p> <p>Slip 6 facilities (pier) subject to routine maintenance activities. No plans for changes/development. Will maintain as needed in perpetuity. Boeing performs routine maintenance of the adjacent shoreline.</p>
Brusco Tug & Barge	NA - Offsite Vessel Operator	NA	Contact said that they have very limited use of the LDW and that most of their work is outside of the LDW in the Puget Sound. Contact indicated that they have worked for Samson Tug & Barge in the past within the LDW. Contact indicated their infrequent use of the waterway did not warrant an in-person interview.

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
Manke Tug & Barge Company	NA - Offsite Vessel Operator	NA	Contact indicated that they operate one push-tugboat with a 16 ft draft to haul gravel up and down the LDW approximately twice per week. The furthest up the LDW they transit is to the 1st Ave. bridge. Contact declined an in-person interview.
National Oceanic and Atmospheric Administration (NOAA)	NA - Offsite Vessel Operator	NA	Contact indicated that NOAA generally does not have inland waterway operations. Contact indicated department of the interior or Washington State Department may have inland operations in LDW. Contact did not know of LDW operations and said that their boats are generally out at sea.
U.S. Coast Guard	NA - Offsite Vessel Operator	NA	Contact said that they have minimal boat operations within the LDW and it is on an as-needed basis. They manage the traffic in and out of the LDW and Elliott Bay through the automatic identification system, radars, cameras, radios, etc. They will deploy boats if they determine that a collision may be imminent to redirect traffic. They may enter the LDW if they are called to a fire, oil spill, collision, etc., but do not have boats residing in LDW; their boats are docked at Pier 36. If vessels are used within the LDW, they would likely be less than 40–50 ft., and most often would be 29 ft boats. The maximum size boat they would use is 87 ft.
Recreational Use Businesses/Associations			
City of Seattle (City of Seattle, Parks Dept. [Herrings House Park])	7666703670	0.45 W	Pursuant to City of Seattle municipal code, all existing parks will be maintained in perpetuity as parks. There are currently no plans for any new shoreline development or overwater structures. Herrings House – currently has no structures.
City of Seattle and King County	7327902355 and 7327901195	3.05 W	Duwamish Waterway Park/Duwamish Rowing Club, 1022 S Monroe Street, Seattle WA 98108, Tax Parcel Number 7327902355 Duwamish River Park, Tax Parcel Number 7327901195 (part of park above)

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
			Pursuant to City of Seattle municipal code, all existing parks will be maintained in perpetuity as parks. There are currently no plans for any new shoreline development or overwater structures.
			Duwamish Waterway Park is the same as “Duwamish River Park”. There are two parcels. One is owned by King County. The Duwamish Rowing Club walks down to the waterway; there are no floating docks.
Alki Kayak Tours	NA	NA	Phone call confirmed recreational watercraft use.
Port of Seattle (T-105 [Park/Public Access])	7666703460; 7666703532	0.1 W	There is a city right-of-way between the north and south T-105 park parcels. Contact noted there is not a maintained boat launch, but people could use T-105 for kayak put-ins. The south parcel has a restored shoreline with woody debris and plantings.
Port of Seattle (T-117)	0001600044	3.5–3.7 W	Currently constructing restoration project. Future plans include steps down to a cobbled beach for a hand-carried boat launch (e.g., kayaks). The public pier will extend into the water way ~190 ft to the edge of the federal navigation channel; pier will be 8 ft wide, on a single row of piles, with a rectangular view point on the end with seating. On the shoreline, there will be a log crib wall, filter fabric lifts, and fill out to the intertidal area. On the shoreline there will also be woody debris in the form of large tow logs at +12 ft, transverse logs every 10-20 ft, at +8 ft, single rank sill logs buried up to the top of the logs as a grade control device.
Port of Seattle (Turning Basin #3 [Park/Public Access])	0423049187	2.85 W	Habitat restoration area with marshes and mudflats. There is a walkway down to the shore, and no piers.
Port of Seattle (Eighth Avenue Public Access)	NA	2.85 W	Shoreline restoration project removing riprap and putting in plantings. There is a kayak launch with steps. No future plans for structures.

Property Owner (Tenant)	Tax Parcel ID#	Approx. River Mile	Waterway Use Activities
Input from EPA Cleanup Site Project Managers			
Boeing (Boeing Plant 2)	0022000005, 2185000005, 3324049002, 0001600020	3.0 to 3.5 E	EPA indicated that shoreline remediation and restoration activities have been completed at this site. Any remaining remediation (under RCRA/TSCA) is limited to upland areas.
Port of Seattle (Terminal 117)	0001600044	3.5 to 3.7 W	EPA reported the remedial action is complete. A Port NRDA restoration plan for the T-117 and adjacent Trenton Boeing shoreline will create 13 acres of habitat. After construction this will include an off-channel intertidal/riparian habitat area in the central portion of the current T-117 uplands area, and the banks of the site will be modified slightly. A small sediment cap will remain in place and there will be a Uniform Environmental Covenant protecting this area.
Star Forge LLC, Jorgensen Forge Early Action Area	0001600023	3.6 to 3.7 E	Jorgensen Forge outfall work is complete. Separate EMJ action for sediments may involve additional sediment work. Extent to which this will involve the shoreline is unknown.
Former Rhone-Poulenc Site (Container Properties)	5422600010	4.1 E	Potential interest in a natural resource damage assessment project on the LDW shoreline, which would include removing riprap and laying back the slope (likely in coordination with nearshore soil/bank cleanup and potentially cleanup of tideflat sediments within facility boundary). The cleanup is not yet planned and is likely a few years away. No work would be done in Slip 6 to the south.

APPENDIX B

WATERWAY ASSESSMENT DATA

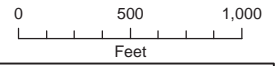
- **FIGURE B-1.** STRUCTURE NUMBER IDENTIFICATION MAP
- **FIGURE B-2.** SHORELINE PHOTOGRAPH LOCATION MAP
- **APPENDIX B-1.** IN-WATER STRUCTURES ASSESSMENT FORMS AND LDW FIELD SURVEY PHOTOGRAPHS FOR STRUCTURES 01–66
- **APPENDIX B-2.** MISCELLANEOUS SHORELINE, LDW FIELD SURVEY PHOTOGRAPHS



Notes:
 1. The waterway features, adjacent property ownership, and assumed property use information presented in this figure is preliminary, based on readily available published data sources and best professional judgment.
 2. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.

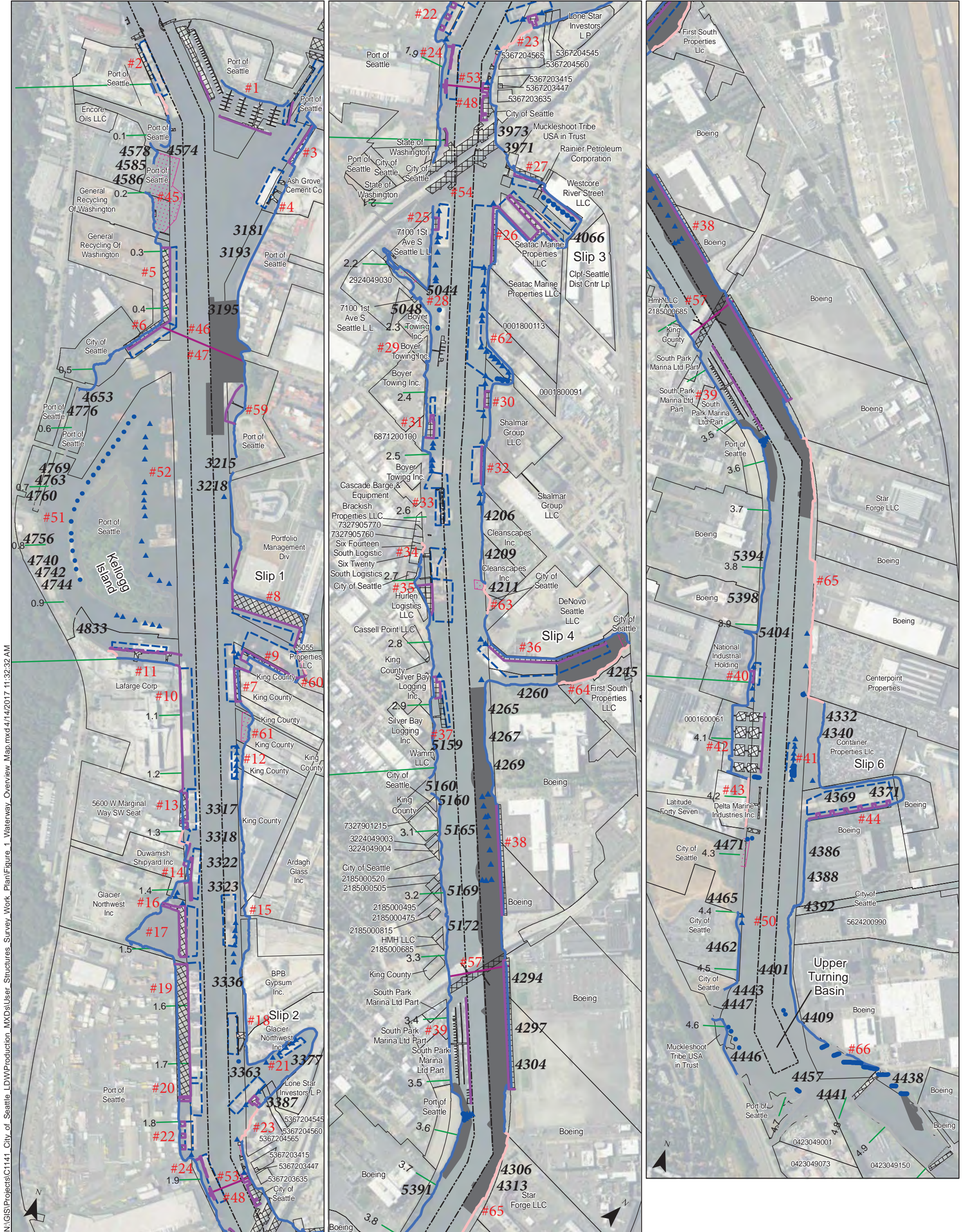
Sources:
 1. The following features have been derived from the Lower Duwamish Waterway Feasibility Study (AECOM 2012)
 - Piles, dolphins, berthing areas: Figure 2-28
 - Shoreline structures: Figure 2-29
 2. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (<http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx>)
 3. Aerial: Esri, NAIP 2015

- Early Action Area (29 acres)
- Overwater Structure
- Underwater Utility
- Navigation Channel
- River Mile Marker
- Armored Slope
- Vertical Bulkhead
- Exposed Bank
- Dock Face
- Pile
- Dolphin
- Pile Group
- Berthing Area
- #99 Structure Number



Lower Duwamish Waterway Group
 Port of Seattle / City of Seattle / King County / The Boeing Company

Appendix B.
Figure B-1: Structure Number Identification Map

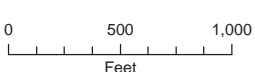


N:\GIS\Projects\C1141 - City of Seattle LDWP\Production_MXD\User Structures Survey Work Plan\Figure 1 - Waterway Overview_Map.mxd 4/14/2017 11:32:32 AM

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- Early Action Area (29 acres)
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 - Underwater Utility
 - Navigation Channel
 - River Mile Marker
 - Armored Slope
 - Vertical Bulkhead
 - Exposed Bank
 - Dock Face
 - Pile
 - Dolphin
 - Pile Group
 - Berthing Area
 - #99 Structure Number
- 1111** Photograph ID & Approx Location



Lower Duwamish Waterway Group
 Port of Seattle / City of Seattle / King County / The Boeing Company

Appendix B.
Figure B-2: Shoreline Photograph Location Map

APPENDIX B-1

IN-WATER STRUCTURES

ASSESSMENT FORMS AND LDW

FIELD SURVEY PHOTOGRAPHS FOR

STRUCTURES 01-66

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Harbor Island Marina</u>	Parcel #: <u>7666701220</u>
_____	Facility Owner: <u>Port of Seattle</u>
River Mile: <u>0</u> Side: <u>East</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Marina. Recreational</u>	Facility Operator: <u>Multiple</u>
<u>and commercial vessel moorage.</u>	Name of Contact: _____
_____	Business Phone #: <u>Multiple</u>
_____	Assessment Date/Time: <u>Jan 10, 2018 at 8:30 AM</u>
Structure was Identified during 2012 Feasibility	Team Leader: <u>BH</u>
Study (Y/N): <u>Y</u>	Assessment Personnel: <u>AP</u>
_____	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Small boat harbor constructed with concrete modular floats and steel guide piles, and accessed from six gangway piers. Covered boat houses are along the west side of the facility. The shoreline slope varies, but is approximately 1:1 along the east shoreline and appears to be vegetated and stabilized with small riprap of various sizes. The armored slope extends north along the east shoreline. The facility is operational.

A corrugate metal pipe outfall (approximately 12" diameter) was observed near the NW corner of the facility (Photo 01-3144).

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Access to the shoreline is restricted to small vessels only due to the floats.

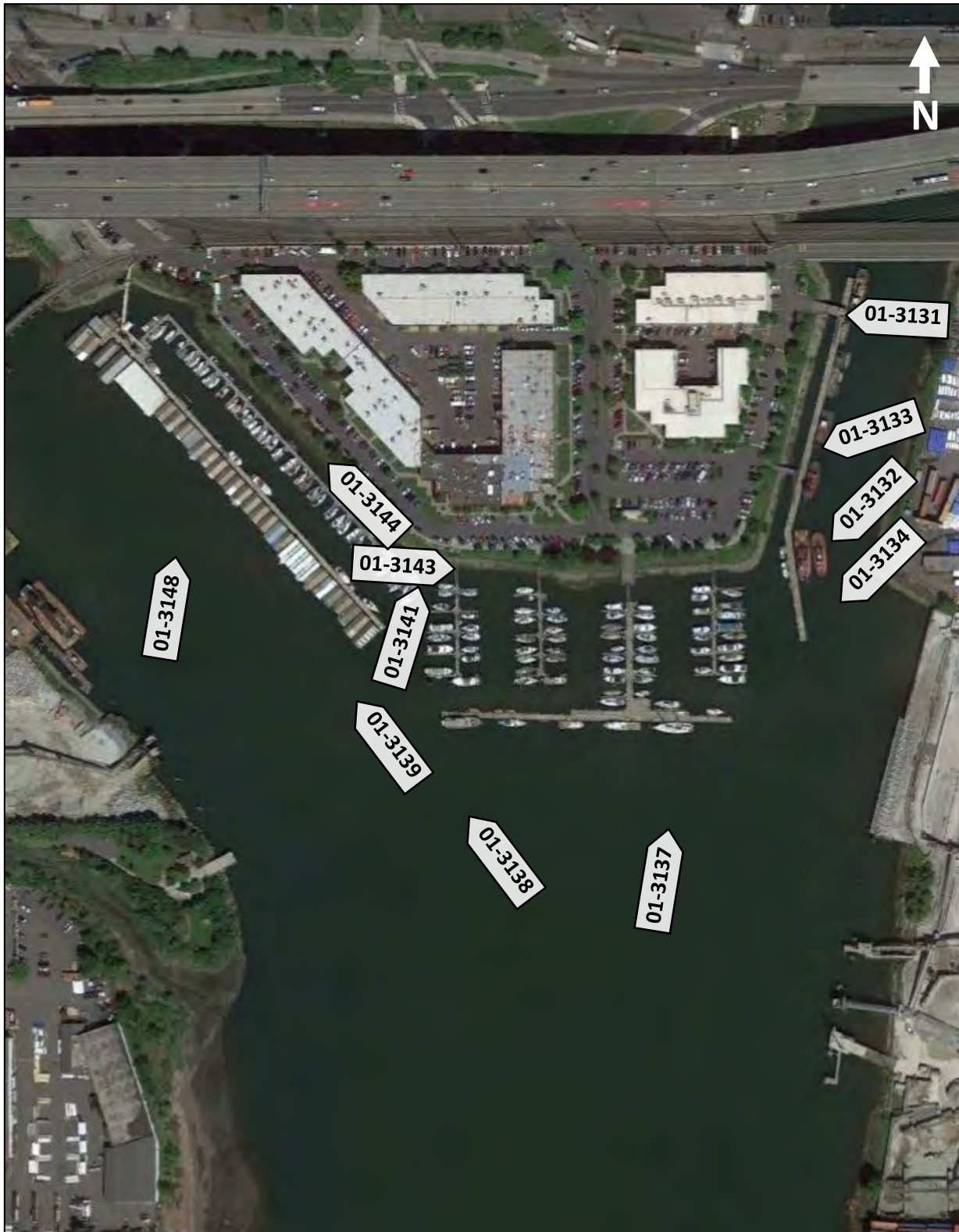
Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/10/2018
----------------------------------	------------------------

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Gangway Pier	01-3131	W	Timber gangway pier and gangway; floats parallel to the shore.						
East Waterway	01-3132	S	East side of the marina; upstream						
Gangway Pier	01-3133	W	Timber gangway pier and gangway; floats parallel to the shore						
East Waterway	01-3134	S	East side of the marina						
General	01-3137	N	Overall view of the marina						
General	01-3138	N	West entrance into the marina						
West Waterway	01-3139	N	West waterway and boat houses along the east shoreline of the marina; downstream						
Floats, Guide Piles	01-3141	NE	Marina interior at the west entrance						
South Shoreline	01-3143	NE	South shoreline and gangway pier						
Shoreline	01-3144	N	East shoreline in the west waterway; outfall; access between floats and the shoreline						
Boat Houses	01-3148	NE	Boat houses along the east shoreline of the west waterway						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

LDW Field Survey Photographs

STRUCTURE 01

STRUCTURE 01



01-3131

2/28/2018



01-3132

STRUCTURE 01



01-3133

2/28/2018



01-3134

STRUCTURE 01



01-3137

2/28/2018



01-3138

STRUCTURE 01



01-3139

2/28/2018



01-3141

STRUCTURE 01



01-3143

2/28/2018



01-3144

STRUCTURE 01



01-3148

2/28/2018

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Glacier Northwest South Wharf
(Terminal 103)

Parcel #: 7666703440

River Mile: 0 Side: West

Facility Owner: Port of Seattle

Structure Type(s)/Use(s): Timber bulkhead with
solid fill fronted by timber pile wharf, steel
transfer bridge. Receipt of sand, gravel, and
stone.

Business Phone #: Unknown

Facility Operator: Glacier Northwest (CalPortland)

Name of Contact: _____

Business Phone #: 206-764-3036

Assessment Date/Time: 1/24/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility
Study (Y/N): Y

Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

This structure includes a wharf constructed with various materials, a floating dock, and a steel transfer span. The north portion of the wharf is cantilevered with steel I-beams. It appears two 20" diameter dolphins along the berthing face may be supporting a portion of the north wharf. The south portion of the wharf is constructed with timber/concrete pile caps, timber stringers, and a concrete deck. The fender piles include timber and steel piles at approximately 5 foot spacing. The wharf pile spacing is unknown because of the high water level. South of the wharf is a floating dock supported by two 3-pile steel dolphins (20" diameter piles). The float berthing face is lined with tires. The south end of the facility has a steel transfer span. The transfer span has two towers supported with four steel piles each. The berthing area is created by five steel mono pile dolphins. Along the shoreline behind the transfer span is a derelict timber wharf. The shoreline at the far north and far south ends are riprap protected. Between the wharf and the transfer span, the gravel and stone material at the facility has spilled onto the shoreline – it is unknown what is beneath the stones and gravel. The facility is operational.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/24/2018

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The access to the shoreline along the full length of the facility has small clearances between structures. The material stored on site will require upland shoring to mitigate additional material from spilling into the waterway.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	02-4504	SW	View of the east berthing face. A cantilevered deck is on the right side of the photo and the concrete/timber wharf with timber fender piles is in the background.						
Wharf and Shoreline	02-4514	W	View of the north end of the wharf and the riprap-protected shoreline to the north of the structure. The concrete rail bridge to the north is visible on the right of the photo.						
Wharf	02-4518	W	View of the north end of the timber wharf. The high water level prevented observations under the wharf.						
North of Structure	02-4519	NW	North of the structure is a rail bridge, a steel sheet pile wall and the West Seattle Bridge.						
North of Structure	02-4520	N	North of the structure is a rail bridge, a steel sheet pile wall and the West Seattle Bridge.						
Wharf	02-4525	N	View of the east berthing face with steel fender piles. The high water level prevented observations under the wharf.						
Wharf	02-4526	NW	View of the south end of the wharf. A concrete pile cap is visible with a gangway leading to a floating dock.						
Floating Dock and Transfer Span	02-4529	S	View of the steel floating dock supported by two steel 3-pile dolphins. A steel transfer span is beyond.						
Shoreline	02-4537	NW	Gravel and stones from the upland operations lines the shoreline. A small derelict timber structure is present between the floating dock and the steel transfer span and south of the transfer span.						
Transfer Span	02-4538	SW	The south end of the facility is a steel transfer span with a total of five steel mono pile dolphins to create a berth.						
Shoreline	02-4542	SW	A small derelict timber structure is present between the floating dock and the steel transfer span and south of the transfer span. A timber pile stub is present offshore of the timber structure.						
Dolphin and Shoreline	02-4558	SW	View of the southern steel mono pile dolphin. The shoreline is riprap protected south of the derelict timber wharf at the transfer span.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 02

LDW Field Survey Photographs



02-4504



02-4514



02-4518



02-4519



02-4520



02-4525



02-4526



02-4529



02-4537



02-4538



02-4542



02-4558

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Ash Grove Cement North Wharf

Parcel #: 7666700350

River Mile: 0.1 Side: E

Facility Owner: Ash Grove Cement Co

Business Phone #: Unknown

Structure Type(s)/Use(s): Timber pile, concrete
decked wharf. Shipment of bulk cement.

Facility Operator: Ash Grove Cement

Name of Contact: _____

Business Phone #: 206-623-5596

Assessment Date/Time: Jan 10, 2018 at 9:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility
Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber pile supported wharf structure with concrete pilecap and concrete decking; 10-foot bent spacing and 5-foot pile-row spacing with areas of transverse cross bracing. Concrete retaining wall along shoreline. Timber fender piling along face of wharf. Timber dolphin cluster on SW corner of structure. The user survey noted this structure is not used, but it appears it could be made operational if needed. South shoreline is vegetated with rock armoring.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Derelict steel dolphin piles approximately 100 feet south of the wharf (Photo 03-3154). Timber pile stub near north end of the facility is approximately 10 feet off the structure's berthing face (Photo 03-3158). Reduced overhead clearance beneath structure observed (thickened concrete deck area) and areas with utilities transverse to facility.

Pile stubs are observed along the south shoreline (Photo 03-3174).

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/10/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
General	03-3151	E	Overall view of the facility						
Upstream	03-3152	S	Looking upstream						
Downstream	03-3153	N	Looking downstream						
Shoreline	03-3154	E	Riprap shoreline, timber pile dolphin, and steel pile cluster south of the facility						
Wharf	03-3156	NE	Typical structure and fender condition						
Wharf	03-3157	E	Typical structure and fender condition						
Wharf, pile stub	03-3158	N	Typical structure and fender condition and pile stub 10 feet off the berthing face						
General	03-3164	E	Overall view of the facility						
Fender System	03-3169	NE	Typical fender system condition						
Timber Pile Dolphin	03-3170	E	Timber pile dolphin on the SW corner						
Wharf Pile Spacing	03-3171	E	View under the wharf of the piles, pile spacing and concrete superstructure						
Fender System	03-3173	N	Timber fender system; isolated missing and broken piling						
Shoreline	03-3174	NE	South shoreline with rock armoring and vegetation; timber pile stubs are observed along the shoreline						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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LDW Field Survey Photographs

STRUCTURE 03

STRUCTURE 03



03-3151

2/28/2018



03-3152

STRUCTURE 03



03-3153

2/28/2018



03-3154

STRUCTURE 03



03-3156

2/28/2018



03-3157

STRUCTURE 03



03-3158

2/28/2018



03-3164

STRUCTURE 03



03-3169

2/28/2018



03-3170

STRUCTURE 03



03-3171

2/28/2018



03-3173

STRUCTURE 03



03-3174

2/28/2018

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Ash Grove Cement South Pier

Parcel #: 7666700350

River Mile: 0.2 Side: East

Facility Owner: Ash Grove Cement Co.

Business Phone #: Unknown

Structure Type(s)/Use(s): Steel and timber pile, timber decked piers and central steel conveyor structure. Receipt of coal, gypsum, gravel, and rock lime.

Facility Operator: Ash Grove Cement/Stoneway Concrete

Name of Contact: _____

Business Phone #: 206-623-5596

Assessment Date/Time: 1/10/2018 10:00 AM

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Team Leader: BH

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Three structures comprise the barge berth. The north structure includes a timber access pier with access to a small pile supported building and steel breasting dolphin. The access pier is constructed with 10-foot bent spacing and 8-foot row spacing and timber cross bracing. Two 14-pile timber dolphins are located on both sides of the north access pier and an overhead conveyor is parallel to the pier. The central structure is a steel pile supported conveyor structure. The south structure is a steel access pier with 20-foot row spacing and 10 foot bent spacing (2 bents). Two steel mooring/berthing dolphin also located on the south end. The shoreline has poured concrete surface at facility. The upstream and downstream shoreline is riprap protected. Visibility of the facility was limited because of a barge at the berth. The facility is operational.

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M&N JN: 9573

TEAM LEADER INITIALS: **BJH**

DATE: **1/10/2018**

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Multiple access piers, conveyors, mooring lines, and miscellaneous cables extend from shore. The shoreline is protected with poured concrete.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall	04-3175	S	Overall view of the north end of the facility.						
Overall	04-3180	N	Overall view of the south end of the facility.						
South Shoreline	04-3181	S	View of the riprap-protected south shoreline.						
South Breasting Dolphin	04-3184	N	Closeup view of the south breasting dolphin.						
Overall	04-3185	E	Overall view of the facility showing the barge at the berth.						
North Shoreline and Access Trestle	04-3186	SE	View of the poured concrete shoreline protection and timber access trestle.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 04

LDW Field Survey Photographs



04-3175



04-3180



04-3181



04-3184



04-3185



04-3186

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Berth No. 1 Wharf (Terminal 105)

Parcel #: 7666703540

River Mile: 0.3 Side: West

Facility Owner: General Recycling of Washington

Business Phone #: Unknown

Structure Type(s)/Use(s): Steel sheet pile

Facility Operator: Birmingham Steel Scrap Yard

bulkhead, concrete wharf, asphalt-surfaced.

Name of Contact: _____

Receipt of scrap metal.

Business Phone #: 206-933-2222

Assessment Date/Time: 1/24/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility

Assessment Personnel: HL

Study (Y/N): Y

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Steel sheet pile wall with a concrete cap. Concrete wharf with concrete piles, pile caps, and deck topped with an asphalt surface. The 18" octagonal piles are spaced at approximately 15'. Timber fender piles line the berthing face at 10 foot spacing. The shoreline north of the wharf is protected with riprap. Approximately 75 feet north of the wharf is a large outfall with wingwalls. Structure #6 is contiguous to the south end of the structure. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Typical under-wharf access restrictions. The non-operational timber structure immediately to the south has tight pile spacing.

Prepared By:

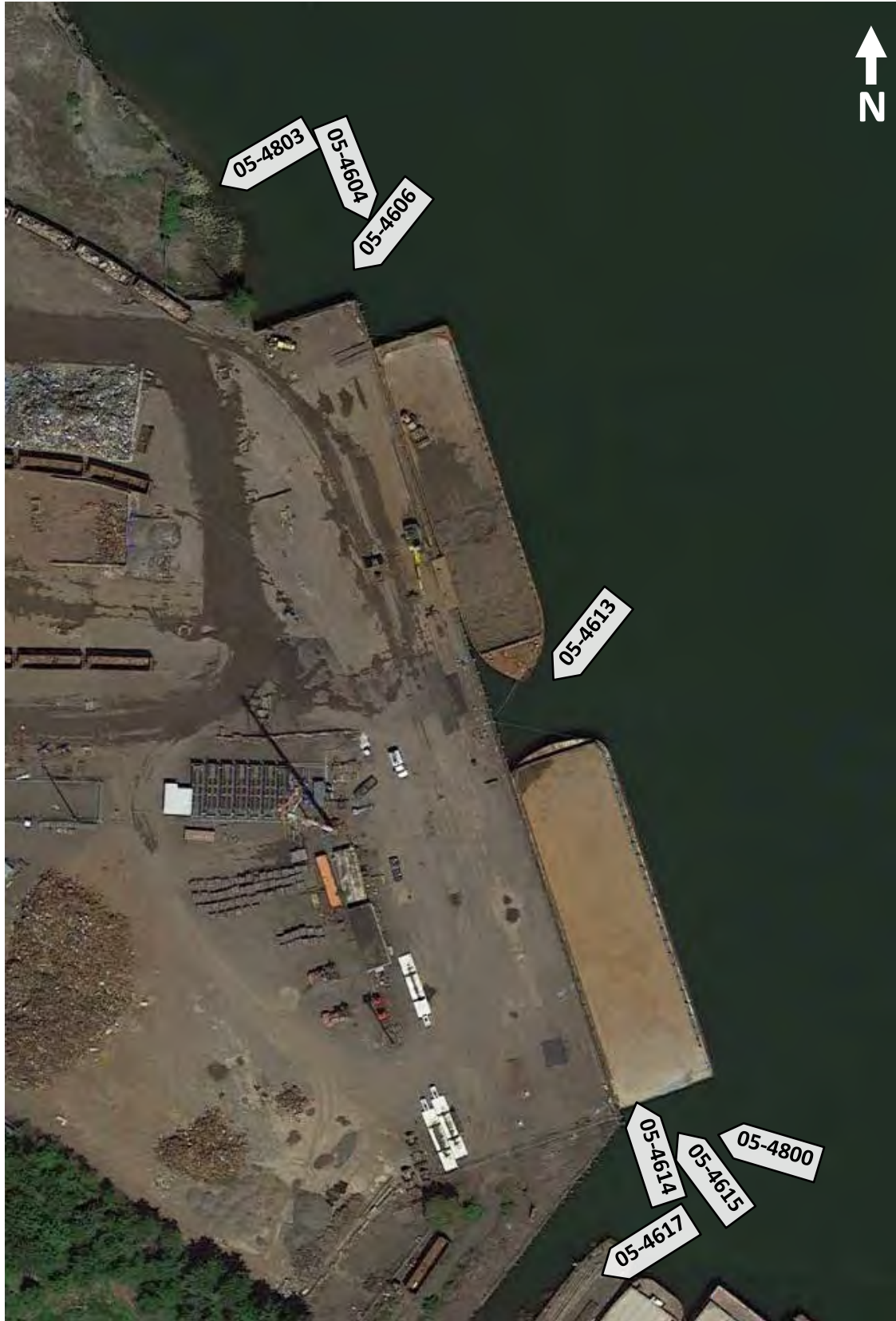


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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	05-4604	S	View of the north end of the concrete wharf.						
Wharf	05-4606	S	Closeup view of the north end of the concrete wharf.						
Wharf	05-4613	W	View of the midpoint of the concrete wharf and timber fender piles.						
Wharf	05-4614	N	View along the berthing face.						
Wharf	05-4615	N	View of the timber fender system.						
South of Structure	05-4617	SW	Structure #6 is contiguous to the south end of the wharf. The waterway outboard of Structure #6 is used as barge berthing.						
Wharf	05-4800	NW	Underdeck view of the concrete wharf.						
Outfall	05-4803	W	View of the large outfall to the north of the wharf.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 05

LDW Field Survey Photographs



05-4604



05-4606



05-4613



05-4614



05-4615



05-4617



05-4800



05-4803

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Berth No. 2 Wharf (Terminal 105)

Parcel #: 7666703630

River Mile: 0.4 Side: West

Facility Owner: General Recycling of Washington

Business Phone #: Unknown

Structure Type(s)/Use(s): Timber bulkhead with solid fill fronted by timber pile, timber-decked wharf. Mooring vessels.

Facility Operator: General Recycling of Washington

Name of Contact: _____

Business Phone #: 206-933-2222

Assessment Date/Time: 1/24/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber wharf with timber piles, pile caps, stringers, and decking. The pile row spacing is approximately 3-5 feet and the bent spacing is approximately 10 feet. Most of the fender piles were not visible above water, but may have pile stubs below the waterline. The bulkhead behind the wharf is timber. The shoreline to the west of the wharf is approximately a 2H:1V slope with scattered riprap and vegetation. The facility is not operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The condition of the wharf and tight pile spacing may restrict access.

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TEAM LEADER INITIALS: **BJH**

DATE: **1/24/2018**

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/24/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	06-4616	SW	View of the timber wharf topside. The face of the wharf, timber bullrail, and mooring fittings have widespread damage.						
Wharf	06-4628	SW	View of the south face of the wharf. Approximately 75 feet to the south of the wharf, barges are stored in the area using their spuds.						
Wharf	06-4635	W	The wharf has widespread damage. In this photo the pile caps do not extend to the outboard pile, the jack stringer is missing and the decking is damaged.						
Wharf	06-4642	W	The west end of the timber wharf. The majority of the fending piles are missing along the wharf.						
Wharf	06-4650	NW	View of the west corner of the wharf. The edge bearing piles are visible below the waterline indicating the pile caps are damaged.						
Wharf and Shoreline	06-4651	NW	View of the west end of the wharf and the shoreline. The shoreline has scattered riprap.						
West Shoreline	06-3652	SW	View of the shoreline to the west of the wharf. The shoreline has scattered riprap.						
Wharf	06-4788	N	View of the west corner of the wharf.						
Wharf	06-4789	NW	Underdeck view of the timber wharf. The west end of the wharf exhibits multiple abandoned piles and tight pile spacing.						
Wharf	06-4794	N	View of the widespread damage along the wharf.						
Wharf	06-4796	NW	Underdeck view of the timber wharf.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 06

LDW Field Survey Photographs



06-4616



06-4628



06-4635



06-4642



06-4650



06-4651



06-4652



06-4788



06-4789



06-4794



06-4796

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Tilbury Cement East Marginal Terminal Parcel #: 1924049052, 1924049070
Wharf _____ Facility Owner: King County
River Mile: 1.0 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete-decked wharf. Receipt of bulk cement and gravel. Facility Operator: Lehigh Cadman

Business Phone #: 425-698-3226
Assessment Date/Time: 1/10/18 at 2:00pm
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete pile supported structure, concrete superstructure and deck. 20ft bent spacing, 8 ft row spacing. Steel fender piles with rubber tires. Steel conveyor structure in middle of facility with a lowered concrete deck section. At shoreline structure consists of steel sheet pile bulkhead. Shoreline north and south of facility is riprap protected. No outfalls observed. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

South of facility, along shoreline is a field of pile stubs.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/10/2018
----------------------------------	------------------------

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments
Wharf	07-3272	E	Underdeck view of the concrete wharf and steel sheet pile bulkhead.
North Shoreline	07-3275	NE	View of the riprap-protected shoreline to the north of the structure. Structure #9 is visible on the left side of the photograph.
Wharf	07-3279	S	View along the berthing face of the structure. The fender system includes steel piles with rubber tires.
Wharf	07-3281	NE	View of the south end of the facility.
Wharf	07-3282	E	View of the conveyor structure supported on steel posts.
Wharf	07-3287	NE	View of the south end of the facility and end of the bulkhead.
South Shoreline	07-3289	E	View of the shoreline south of the structure. The shoreline is protected with concrete rubble. Structure #61 is just south of Structure #7.

Photos Required:

- | | |
|--|---|
| <input type="checkbox"/> All Structure Faces (N, S, E, W) | <input type="checkbox"/> Upstream/Downstream Views of Channel |
| <input type="checkbox"/> Significant Defects/Deterioration | <input type="checkbox"/> Typical Shoreline Conditions |
| <input type="checkbox"/> Timber Debris (if visible) | <input type="checkbox"/> Access Limitations |

STRUCTURE 07

LDW Field Survey Photographs



07-3272



07-3275



07-3279



07-3281



07-3282



07-3287



07-3289

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: U.S. Government Wharf

Parcel #: 3573200975

River Mile: 1.0, north side Slip 1 Side: East

Facility Owner: Portfolio Management Div

Business Phone #: Unknown

Structure Type(s)/Use(s): Contiguous timber and concrete wharf, concrete decked structures with a floating dock. Mooring vessels / previously used for containerized shipments.

Facility Operator: Federal Center South

Name of Contact: _____

Business Phone #: 253-931-7720

Assessment Date/Time: 1/10/2018 12:30 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The primary structure includes a concrete wharf supporting a building within Slip 1 and a contiguous timber wharf extending west from the concrete wharf and turning north along the shoreline of the waterway. Both the timber-pile supported structure and concrete-pile supported structure have approximately 10-foot bent spacing and 5-foot row spacing. At the southeast end, an aluminum gangway provides access to a small floating dock. A concrete bulkhead is present beneath structure. The shoreline north of the facility is riprap-protected and vegetated. The shoreline south of the facility is vegetated and has concrete rubble. Facility appears operational for mooring of vessels.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Multiple small diameter steel pipes (3-in diameter) restrict access to the shoreline at north end of facility. A derelict timber wharf is present along the north shoreline and is separated from rest of the facility by a rock armored shoreline. Three timber dolphins are present approximately 50 feet from

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TEAM LEADER INITIALS: BJH

DATE: 1/10/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

the shoreline at the north end of the facility. Batter piles beneath facility limit access beneath north end of structure. Utility piping along south and east end of facility restrict underdeck access (approx. 12-inch diameter steel pipe approx. 5 feet below the deck elevation). A field of timber pile stubs along the south shoreline restrict access to shore.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Shoreline and North Timber Wharf	08-3220	SE	View of the small riprap-protected and vegetated shoreline. A field of vertical small diameter pipes and a derelict timber wharf is present along the north shoreline.						
North Timber Wharf and Timber Dolphin	08-3225	E	View of the derelict timber wharf and timber dolphin along the north shoreline.						
North Shoreline and Timber Wharf	08-3228	E	View of the riprap-protected shoreline between the north timber wharf and primary timber wharf. Three timber dolphins are present offshore of the primary timber wharf (Two visible in this photograph).						
Timber Wharf	08-3230	NE	View of the SE corner of the timber wharf. The corner exhibits evidence of damage from vessel impact.						
Timber Wharf	08-3231	N	View of the timber wharf. The tight pile spacing, low hanging utilities, and damaged wharf components may restrict access.						
Concrete Wharf	08-3233	E	General view of the concrete wharf supporting the building.						
Timber Wharf	08-3235	NE	View of fender pile and wharf damage along the wharf.						
Concrete Wharf	08-3239	N	Closeup view of the concrete wharf and low hanging utility pipes under the wharf.						
Concrete Wharf and Floating Dock	08-3242	E	View of the SE leg of the concrete wharf and the small floating dock.						
Concrete Wharf and South Shoreline	08-3246	E	View of the south end of the concrete wharf within Slip 1. A field of tightly spaced timber piles is present to the south. The south shoreline is vegetated with isolated riprap and debris.						
General Wharf	08-5448	W	General view of the concrete wharf supporting the building and the contiguous timber wharf beyond the building.						
Timber Wharf	08-5452	NE	Closeup view of the timber wharf.						
Timber Wharf	08-5454	E	Closeup view of the timber wharf and riprap-protected shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 08

LDW Field Survey Photographs



08-3220



08-3225



08-3228



08-3230



08-3231



08-3233



08-3235



08-3239



08-3242



08-3246



08-5448



08-5452



08-5454

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Manson Construction Wharf Parcel #: 1924049041

Facility Owner: King County
River Mile: 1.0 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete-decked wharf, timber wharf extension, and steel dolphins. Mooring vessels and floating equipment, and moving supplies to and from barges. Facility Operator: Manson Construction
Name of Contact: _____
Business Phone #: 206-764-8531
Assessment Date/Time: 1/10/18 – 1:30pm
Team Leader: BH
Structure was Identified during 2012 Feasibility Study (Y/N): Y Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The facility is on the south side of Slip 1 and just south of Slip 1. It is a concrete-pile supported wharf with concrete superstructure and deck with timber fender piles. The concrete piles have approximately 20-foot bent spacing and 10-foot row spacing. A timber mooring camel is along the face of the fender piles. The western portion of the facility is a timber-pile supported structure and timber superstructure with 10-foot by 5-foot pile spacing. One steel three-pile dolphin and four steel mono piles are located off the west side of the wharf with floating docks and a barge berth. The shoreline beneath the structure is protected with riprap. A steel sheet pile wall is located at the east end of the facility within Slip 1. The facility is operational. There were no outfalls observed.

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TEAM LEADER INITIALS: BJH

DATE: 1/10/2018

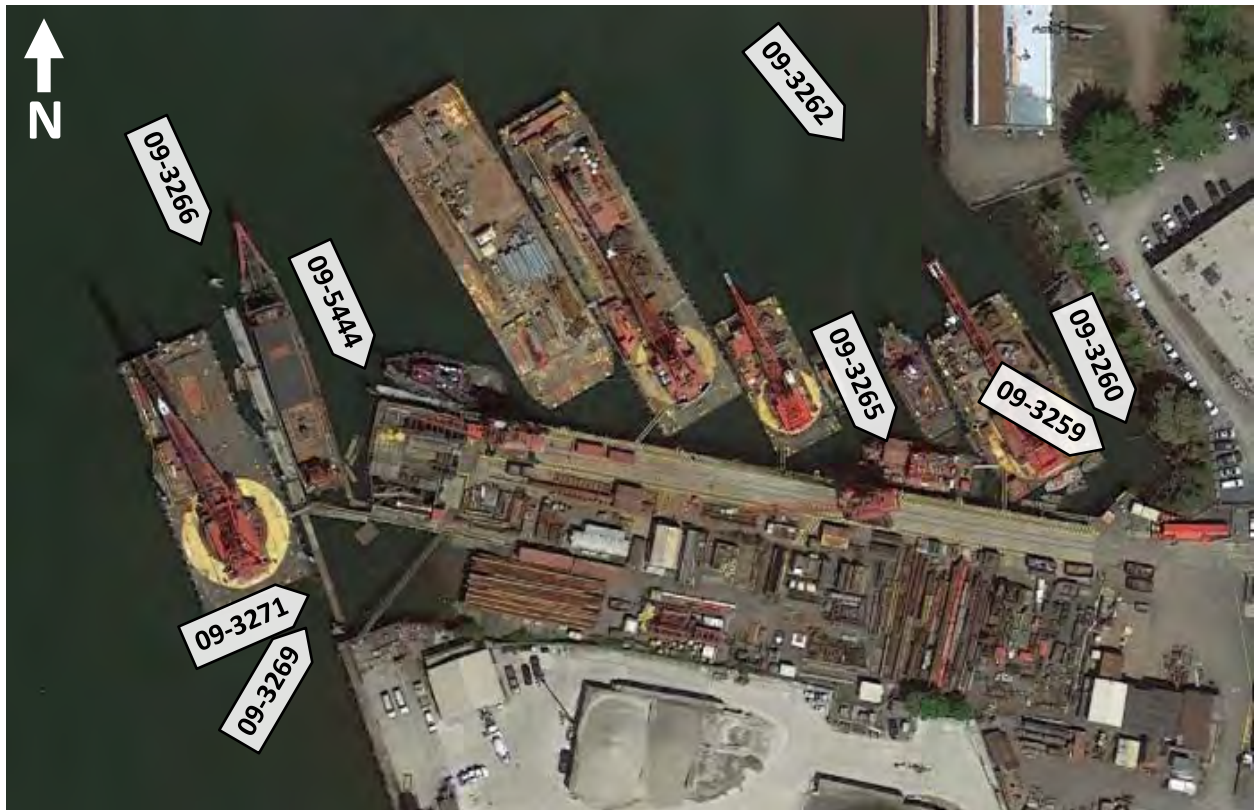
Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

This wharf has typical underdeck clearance and riprap along the full length. Multiple derrick barges and cranes restrict access to facility. A pile field is present at the east end of the facility. The accumulation of small debris is present under the timber wharf.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Steel Sheet Pile Bulkhead	09-3259	SE	View of the steel sheet pile wall and adjacent pile field at the northeast corner of the wharf.						
Concrete Wharf	09-3260	S	View of the east end of the concrete wharf and the gangway to a small boat floating dock.						
Overall / Vessel Obstructions	09-3262	E	View of the various barges and vessels that are moored at the facility.						
Concrete Wharf	09-3265	S	View of the concrete wharf at an opening between vessels at the midpoint of the wharf.						
Dolphins	09-3266	S	View of the steel 3-pile dolphin and four mono-pile dolphins off the west end of the wharf.						
Dolphins and Timber Wharf	09-3269	N	View of the steel mono-pile dolphins, floating walkways, and west timber wharf extension.						
Timber Wharf	09-3271	NE	View of the west timber wharf extension.						
Timber Wharf and Floating Dock	09-5444	S	View of the timber wharf and floating walkway. Accumulation of small debris is present under the wharf.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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STRUCTURE 09

LDW Field Survey Photographs



09-3259



09-3260



09-3262



09-3265



09-3266



09-3269



09-3271



09-5444

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Lafarge Corporation Raw Materials Parcel #: 1924049003
Wharf Facility Owner: Lafarge Corp
River Mile: 1.0 to 1.25 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Steel sheet pile, cellular Facility Operator: Lafarge Corp
bulkhead. Receipt of limestone, shale, coal, and Name of Contact: _____
slag. Business Phone #: 206-937-8025
_____ Assessment Date/Time: 1/24/2018 3:30 PM
_____ Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: HL
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Steel sheet pile cellular bulkhead with concrete cap. The fender system includes steel piles faced with rubber panels. A timber dolphin is present on both the north and south ends of the facility. The facility is contiguous with Structure # 13 to the south. The shoreline on the north end of the facility is a 1H:1V riprap slope that extends behind Structure #11. Three outfalls that penetrate through the bulkhead are present at the south end of the facility. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The entire length of the facility makes up berths for various vessels and barges. There is tight clearance between the bulkhead and piles in the concave locations between cells.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Sheet Pile Bulkhead	10-4817	S	View of the north end of the facility. A 3-pile steel dolphin is to the north of the bulkhead. Structure #11 is visible on the right side of the photograph.						
Sheet Pile Bulkhead	10-4835	S	View of the north corner of the steel sheet pile cellular bulkhead and concrete cap. A 4-pile timber dolphin is located at the north corner.						
Sheet Pile Bulkhead	10-4839	N	View of the steel sheet pile cellular bulkhead and concrete cap. The fender system consists of steel piles with rubber rub panels.						
Sheet Pile Bulkhead	10-4841	W	Underdeck view of the bulkhead and cap. Concrete piles and a steel beam support the concrete cap.						
Sheet Pile Bulkhead	10-4844	W	Underdeck view of the bulkhead and cap. Concrete piles and a steel beam support the concrete cap.						
Sheet Pile Bulkhead	10-4846	N	View of the steel sheet pile cellular bulkhead and concrete cap.						
Outfalls and Sheet Pile Bulkhead	10-4860	W	Three outfalls penetrating the steel sheet pile wall are present at the south end of the facility. Also, an 8-pile timber dolphin is present at the south end.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 10

LDW Field Survey Photographs



10-4817



10-4835



10-4839



10-4841



10-4844



10-4846



10-4860

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Lafarge Corporation Cement Wharf Parcel #: 1924049003

River Mile: 1.0, south of Kellogg Island Side: West Facility Owner: Lafarge Corp
Structure Type(s)/Use(s): Two L-shaped timber Business Phone #: Unknown
pile, timber-decked piers, connected by timber Facility Operator: Lafarge Corp
catwalks. Receipt and shipment of bulk cement. Name of Contact: _____

Business Phone #: 206-937-8025
Assessment Date/Time: 1/24/2018 3:00 PM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: HL
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber berthing structure comprised of two L-shaped piers and a timber walkway providing access to eight timber or steel berthing and mooring dolphins. The timber dolphins are 20+ piles each and have either a timber pile face or a steel panel with rubber rub strips. An additional 3-pile steel dolphin is located to the east of the structure. The L-shaped piers are supported by timber piles with 10 foot spacing. It appears the eastern 70-foot-long finger of the timber walkway has recently been removed. The shoreline is approximately 1H:1V and is riprap protected. On the west end of the facility, a steel sheet pile wall is present. Multiple barges and vessels were at berth and were moored along the dolphins across the channel between Structure #11 and Kellogg Island. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The timber dolphins have a large number of battered piles with tight spacing. Access to the majority of the waterway is restricted because of the multiple vessels and barges moored in the area.

Prepared By:



moffatt & nichol

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Seattle, WA 98101

M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Dolphins and Walkway	11-4809	E	View of the timber dolphins and timber access walkway.						
Dolphin and West Shoreline	11-4810	W	View of the western timber dolphin and the riprap-protected shoreline to the west.						
Dolphins and Sheet Pile Wall	11-4811	SW	View of the timber dolphins. The dolphin in the front has steel fendering with rub strips. The dolphin in the background has timber pile fenders. The steel sheet pile wall is visible on the left side of the photograph.						
Dolphins and Sheet Pile Wall	11-4814	S	View of the timber dolphins and the sheet pile wall behind the walkway along the shoreline.						
Dolphin and Pier	11-4819	S	View of the 3-pile steel dolphin to the east of the eastern L-shaped timber pier. The shoreline is riprap protected.						
Pier and Dolphin	11-4822	SW	View of the eastern L-shaped timber pier and a 3-pile steel dolphin.						
Dolphin and Walkway	11-4823	W	View along the berthing face showing the timber walkway and a timber dolphin.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 11

LDW Field Survey Photographs



11-4809



11-4810



11-4811



11-4814



11-4819



11-4822



11-4823

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: J.A. Jack and Sons Wharf

Parcel #: 1924049043

River Mile: 1.2 Side: East

Facility Owner: King County

Structure Type(s)/Use(s): Offshore row of 5

Business Phone #: Unknown

steel dolphins and 1 timber dolphin, conveyor

Facility Operator: J. A. Jack and Sons

structure, and catwalk. Receipt of limestone.

Name of Contact: _____

Business Phone #: 206-762-7622

Assessment Date/Time: 1/10/2018 at 2:30pm

Team Leader: BH

Structure was Identified during 2012 Feasibility
Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Barge berth with five steel three-pile mooring dolphins, one steel pile supported conveyor structure, and one timber dolphin. Conveyor structure and catwalk structure (both steel) extend from shore to the middle of the facility. The facility appears to be operational. The shoreline is stabilized with concrete debris and ecology blocks. No outfalls were observed.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Mooring lines are tied between shore and various mooring dolphins. Large pieces of concrete rubble and ecology blocks line the full length of shoreline. The conveyor structure and adjacent dolphins have tightly spaced piles.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/10/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall / Shoreline	12-3298	S	Overall view of the facility and shoreline.						
North Shoreline	12-3299	E	View of the concrete-rubble protected shoreline to the north.						
Timber Dolphin	12-3301	SE	View of the timber dolphin on the north end of the barge berth.						
Steel Dolphin	12-3305	S	View of the typical steel dolphin with tire fenders.						
Conveyor Support Structure	12-3310	SE	View of the conveyor support structure.						
Steel Dolphin and South Shoreline	12-3314	SE	View of the southern steel dolphin and concrete-rubble and riprap protected shoreline.						
Conveyor Support Structure	12-3315	N	Elevation view of the south side of the conveyor structure.						
South Shoreline	12-3316	E	View of the concrete-rubble protected shoreline.						
South Shoreline	12-3317	SE	View of the riprap protected shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 12

LDW Field Survey Photographs



12-3298



12-3299



12-3301



12-3305



12-3310



12-3314



12-3315



12-3316



12-3317

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Alaska Marine Lines Dock No. 1 Parcel #: 1924049026

River Mile: 1.25 Side: West Facility Owner: 5600 W Marginal Way SW Seat
Business Phone #: Unknown
Structure Type(s)/Use(s): Timber pile, timber- and Facility Operator: Alaska Marine Lines
concrete-decked wharf. Containerized general Name of Contact: _____
cargo. Business Phone #: 206-439-5490

Assessment Date/Time: 1/24/2018 4:00 PM

Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: HL
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber wharf with timber piles. The north portion of the wharf includes timber pile caps, stringers, and decking. The south portion of the wharf appears to have a concrete deck. The pile row spacing is approx. 3-5' and the bent spacing is approx. 10'. A steel sheet pile bulkhead is present along the shoreline that extends south beyond the structure. The bulkhead is contiguous with the Structure #10 cellular wall on the north end. 3-pile steel dolphins are present at the north and south wharf corners. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Close pile spacing under the wharf. The sheet pile bulkhead extends the entire facility length.

Prepared By:

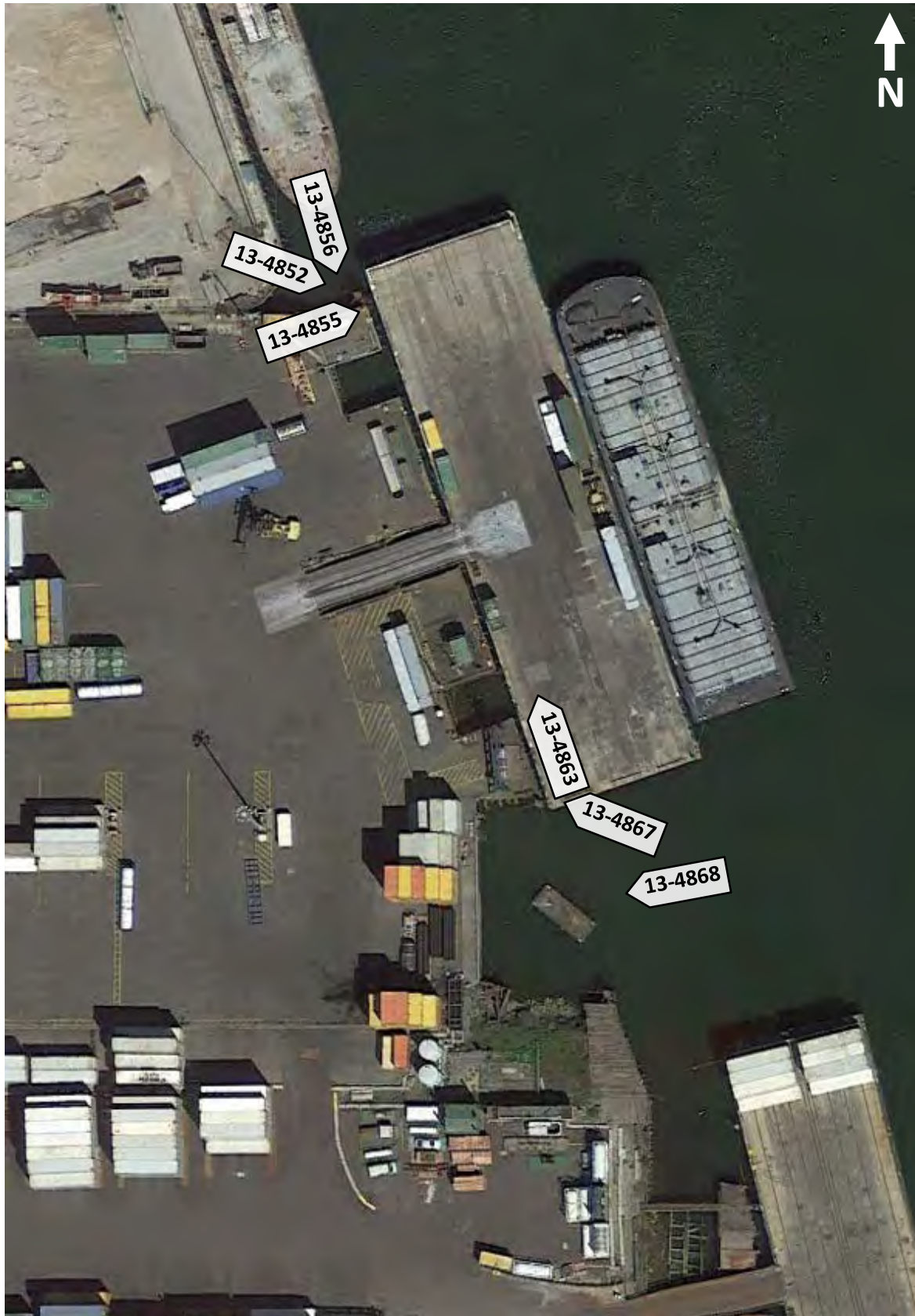


600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/24/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	13-4852	SE	View of the north side of the timber wharf.						
Dolphin	13-4855	E	View of the 3-pile steel dolphin to the north of the structure.						
Wharf	13-4856	SW	Underdeck view of the timber wharf.						
Wharf	13-4863	N	View along the berthing face of the structure. The structure has a concrete deck on the south portion of the wharf. Steel fender piles are installed along the wharf face.						
Wharf and Bulkhead	13-4867	W	View of the south end of the structure. There is a 3-pile steel dolphin at the south corner and a steel sheet pile bulkhead extends south of the structure.						
Bulkhead	13-4868	W	A steel sheet pile bulkhead extends south along the shoreline from the structure. Work floats are tied up south of the structure.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 13

LDW Field Survey Photographs



13-4852



13-4855



13-4856



13-4863



13-4867



13-4868

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Duwamish Shipyard Graving Dock Parcel #: 1924049028
Wharf Facility Owner: Duwamish Shipyard Inc.
River Mile: 1.3 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Wharf: concrete and Facility Operator: Duwamish Shipyard Inc.
timber pile bulkhead; historical graving dock Name of Contact: _____
(subsequently filled in): steel sheet pile retaining Business Phone #: 206-910-4279
walls, concrete floor, steel gate. Floating dock. Assessment Date/Time: 1/25/2018 9:30 AM
Mooring vessels for repair / previous shipment of Team Leader: BH
concrete fabrications and mooring vessels. _____
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

This assessment form combines Structures #14 and #16. Timber pile supported wharf with timber superstructure adjacent to shore. Timber platforms offset from shore (similar construction). Timber wharf transitions to timber bulkhead with timber piles and timber lagging. Steel tripod dolphin at north end. Along berthing line there are five steel berthing piles. A steel transfer span provides access from shore to moored vessels. Mooring lines prevents access behind moored barge. Shoreline appears primarily unarmored. South shoreline inside of timber floats has riprap armoring. No outfalls observed. Timber float with steel guide piles at south end of structure. The basin is dredged behind the dolphins on south side. Both facilities are operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: **BJH**

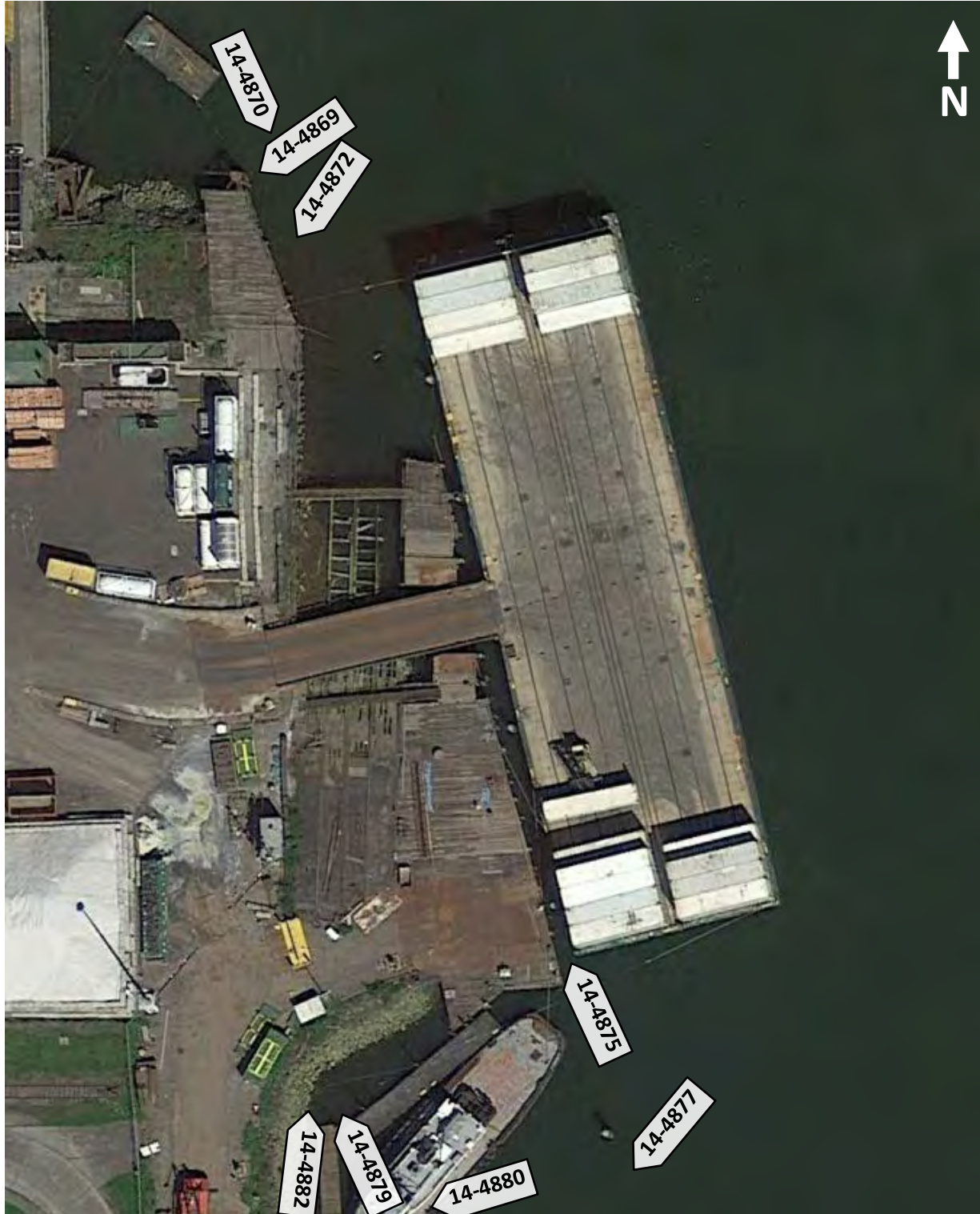
DATE: **1/25/2018**

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

Steel berthing dolphins along berthing face may limit access for larger vessels beneath structure. Steel guide piles from timber float restrict access to shore at south end. Guide piles approx. 20ft spacing.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	14-4869	SW	View of the north corner of the timber wharf. A 3-pile steel dolphin is present at the north corner.						
Berth and Transfer Span	14-4870	S	View of the steel mono pile dolphins that create the berth. A transfer span extends from shore to the barge at berth.						
Wharf	14-4872	SW	View of the timber wharf and transition to the timber bulkhead.						
Dolphins	14-4875	N	View of the steel mono pile dolphins that create the berth.						
Floating Dock	14-4877	SW	View of the floating dock to the south of the facility.						
Floating Dock	14-4879	NW	View of the floating dock to the south of the facility.						
Shoreline	14-4880	W	View of the riprap-protected shoreline to the south of the facility.						
Shoreline and Floating Dock	14-4882	NW	View of the riprap-protected shoreline and floating dock to the south of the facility.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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STRUCTURE 14/16

LDW Field Survey Photographs



14-4869



14-4870



14-4872



14-4875



14-4877



14-4879



14-4880



14-4882

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: General Construction Mooring

Parcel #: 1722802315

Facility Owner: Unknown

River Mile: 1.4 Side: East

Business Phone #: Unknown

Structure Type(s)/Use(s): Offshore row of 6 steel
dolphins. Mooring floating equipment and
barges.

Facility Operator: General Construction

Name of Contact: _____

Business Phone #: 206-938-6750

Assessment Date/Time: 1/11/2018 10:00AM

Team Leader: BH

Structure was Identified during 2012 Feasibility
Study (Y/N): Y

Assessment Personnel: SS

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Three dolphin berths with two dolphins each berth (6 dolphins total). Each dolphin is constructed with 3 piles (24"-30" steel pipe). The shoreline is protected with small riprap at approximately a 2:1 slope. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

No access restrictions apparent.

Prepared By:

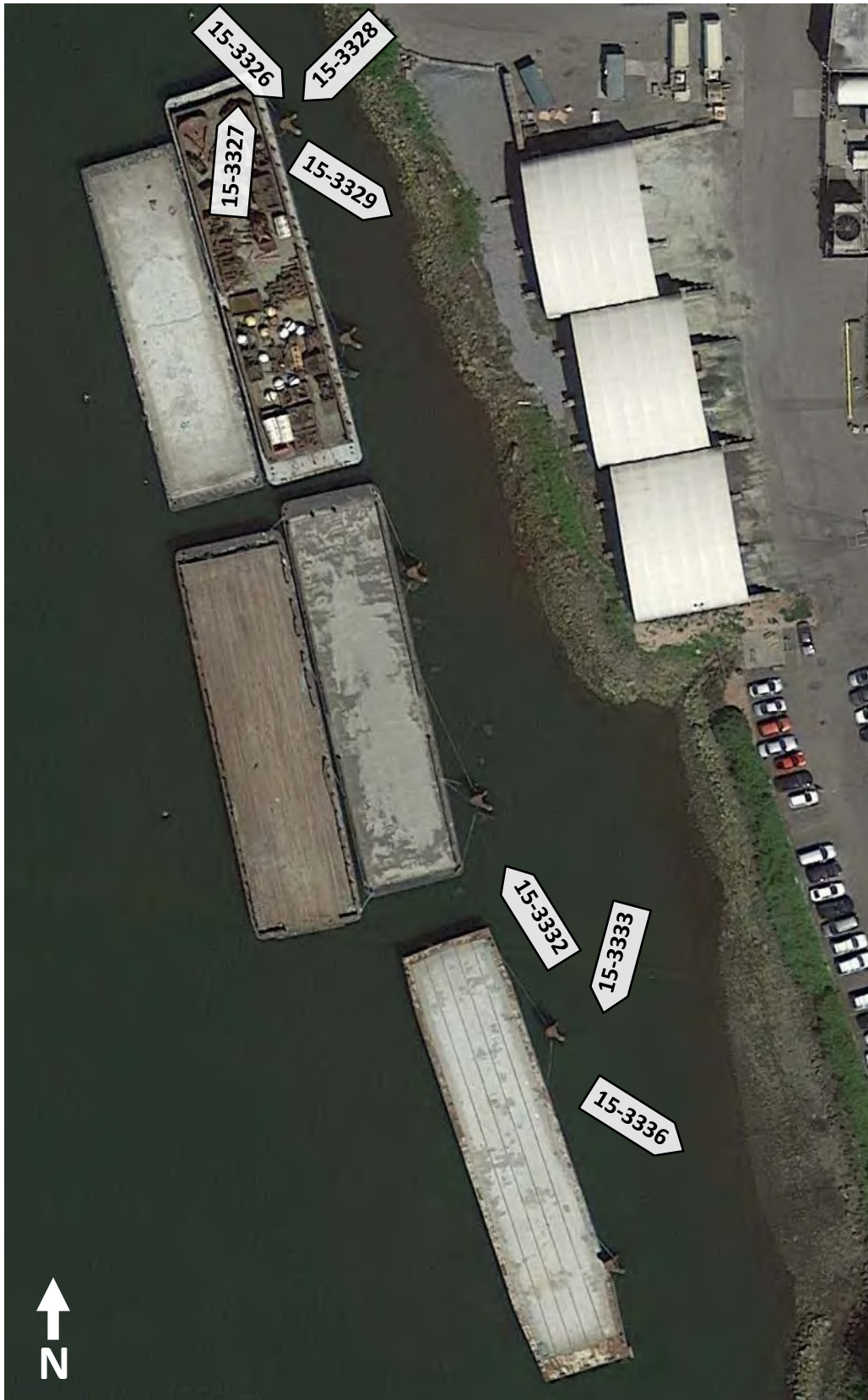


600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/11/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall / Dolphins	15-3326	S	Overall view of the row of dolphins parallel to the shoreline.						
Shoreline	15-3327	N	View of the riprap protected shoreline north of the barge berths.						
Dolphin	15-3328	S	View of the typical steel 3-pile dolphin.						
Shoreline	15-3329	SE	View of the riprap protected shoreline.						
Overall / Dolphins	15-3332	N	Overall view of the row of dolphins parallel to the shoreline.						
Dolphins	15-3333	S	View of the dolphins on the south end of the barge berths.						
Shoreline	15-3336	SE	View of the riprap protected shoreline south of the barge berths.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 15

LDW Field Survey Photographs



15-3326



15-3327



15-3328



15-3329



15-3332



15-3333



15-3336

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Glacier Northwest West Terminal Parcel #: 1924049029
Wharf Facility Owner: Glacier Northwest Inc.
River Mile: 1.5 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete-decked marginal wharf with concrete-decked approach. Receipt of bulk cement. Facility Operator: Glacier Northwest (CalPortland)
Name of Contact: _____
Business Phone #: 206-764-3036
Assessment Date/Time: 1/25/2018 10:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Study (Y/N): Y Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete marginal wharf and access trestle with concrete piles, pile caps and deck. Concrete bulkhead at shoreline supports landside end of concrete access trestle that extends to the concrete wharf. Pile spacing approx. 5ft x 20ft bent spacing on trestle. 8ft x 20ft pile spacing on marginal wharf. Timber dolphin cluster at north end of structure. Steel fender piles along face of wharf at 10ft spacing with steel walers. Shoreline appears armored with riprap and concrete debris. Facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Access to shoreline is restricted by the concrete access trestle from the north. Timber pile stub observed under north end of wharf. Water to pile cap distance approx. 3 ft at 0900 on 1/25/18. South end access restricted by narrow width between wharf and shoreline.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



STRUCTURE 17

LDW Field Survey Photographs



17-4885



17-4887



17-4889



17-4897



17-4904



17-4905



17-4907

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: James Hardie Gypsum Wharf Parcel #: 1924049092
River Mile: 1.6 Side: E Facility Owner: BPB Gypsum, Inc.
Structure Type(s)/Use(s): Steel and timber pile, Business Phone #: Unknown
timber-decked T-head pier extending from a steel Facility Operator: Certain Teed Corporation
sheet pile bulkhead with solid fill. Receipt of bulk Name of Contact:
cement and gypsum rock. Business Phone #: 206-768-3789
Assessment Date/Time: 1/11/2018 11:00AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

T-head pier with central platform and walkways to dolphins. Main platform is a timber deck supported on steel pipe piles, with piles at approximately 10'x10' spacing with horizontal bracing. Walkways supported on timber piles with timber beam walkways. Steel pipe pile fender system and dolphins along berthing face. Pile supported conveyer along north side shoreline. The north shoreline is armored with small rock at a ~1:1 slope. The central and south shorelines exhibit almost vertical slopes covered in concrete. A cluster of piles is located just north of the main platform inboard of the walkways. A pile-supported tank and conveyor/pipe system is located south of the main platform inboard of the walkway. A steel mono fender pile is located off the south end of the south walkway. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The conveyor, equipment, and buildings along the north, central, and south shorelines limit access.

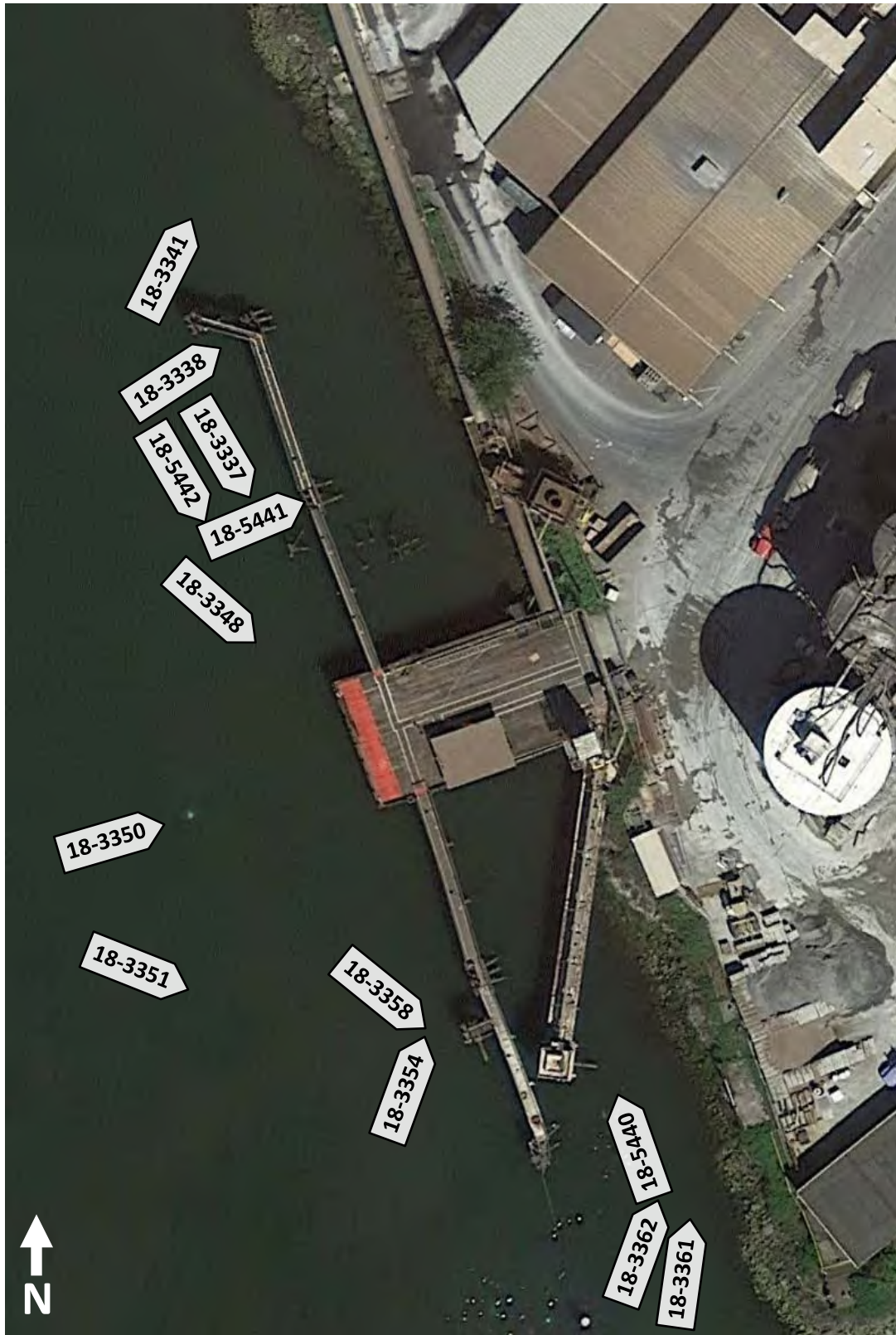
Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

Table with 2 columns: TEAM LEADER INITIALS: BJH, DATE: 1/11/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Timber Walkway	18-3337	S	View of the berthing face and timber walkways. A pile field is visible on the inboard side of the walkway.						
Timber Walkway Support	18-3338	E	View of the northern timber walkway support.						
North Shoreline	18-3341	NE	Riprap protected shoreline north of the structure. A small concrete structure is located along the shoreline on the north end of the facility.						
T-Head Pier	18-3348	E	Timber T-head pier and timber fender piles.						
Overall / T-Head Pier	18-3350	E	Overall view of the over-water structures.						
Walkways and Dolphins	18-3351	SE	View of the southern timber walkway and timber dolphins.						
Walkways	18-3354	N	View of the southern timber walkway.						
Walkways and Dolphins	18-3358	NE	View of the southern timber walkway and dolphins.						
South Shoreline	18-3361	NE	View of the unprotected shoreline on the south end of the facility.						
South Shoreline	18-3362	NE	View of the unprotected shoreline on the south end of the facility and the bulkhead with steel soldier piles and timber lagging.						
Overall	18-5440	N	View of the over-water structures.						
Shoreline	18-5441	E	View of the unprotected shoreline at the structure.						
Overall	18-5442	S	View of the T-head pier, walkways, and steel pipe pile dolphin.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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STRUCTURE 18

LDW Field Survey Photographs



18-3337



18-3338



18-3341



18-3348



18-3350



18-3351



18-3354



18-3358



18-3361



18-3362



18-5440



18-5441



18-5442

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Northland Services (Terminal 115) Parcel #: 5367202505

River Mile: 1.5 to 1.9 Side: West Facility Owner: Port of Seattle
Structure Type(s)/Use(s): Berth 1: Piers A and C Business Phone #: Unknown
center timber pier, Pier B ramp support structure Facility Operator: Multiple
and A-Frame. Name of Contact: _____
Barge loading and unloading. Business Phone #: Multiple

Assessment Date/Time: 1/25/2018 at 9:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete pile supported wharf with concrete superstructure and decking. 20ft bent spacing, 3ft row spacing. The south end of the wharf is contiguous with Structure #20. Timber fender piles at 10ft spacing with timber walers. Shoreline is armored with riprap where visible north and south of structure. Steel sheet pile wall bulkhead at shoreline. Approx. 3ft clearance between water and pile caps at 0915 on 1/25/18. Timber dolphin cluster at N end of structure. Structure is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Moored barges restrict inspection access along face of wharf. Approx. 3ft clearance between water and pile caps at 0915 on 1/25/18.

Prepared By:

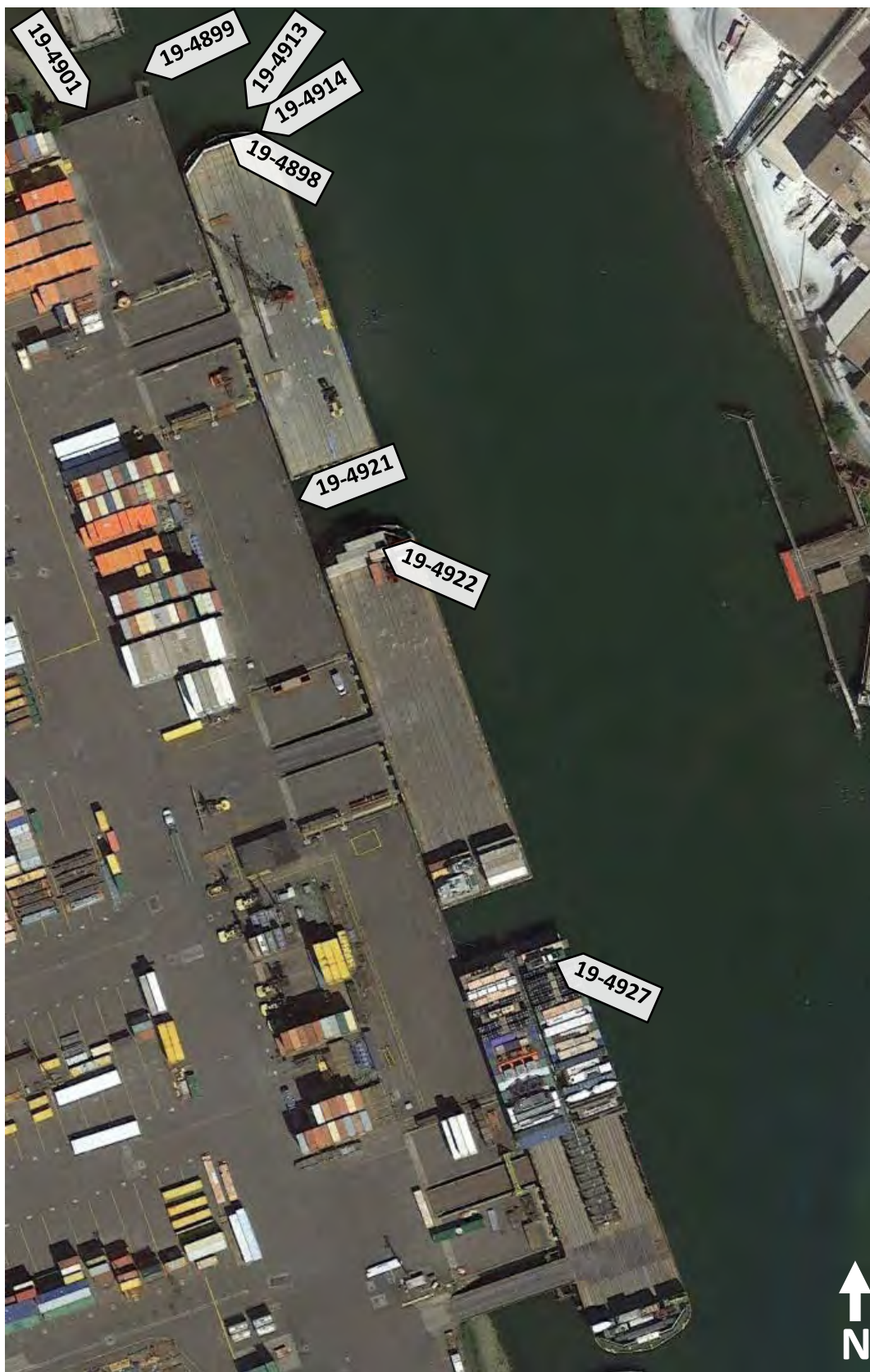


600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:

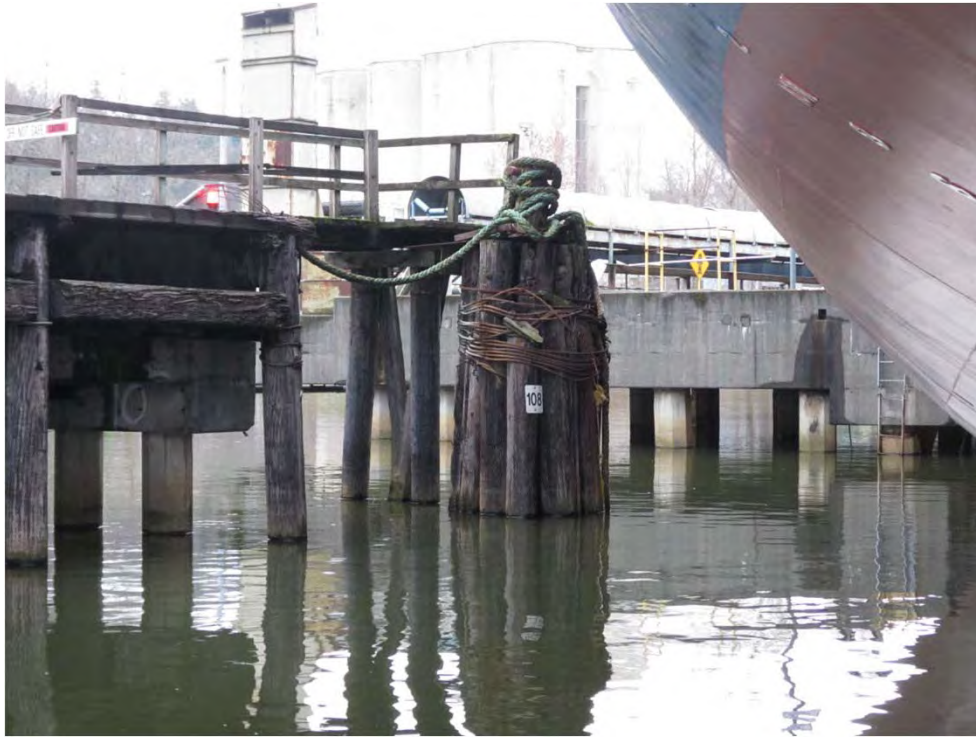


4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Dolphin	19-4898	NW	View of the timber dolphin at the north end of the wharf. Structure #17 is in the background.						
Shoreline	19-4899	W	View of the riprap-protected shoreline to the north of the structure.						
Wharf	19-4901	S	Underdeck view of the concrete wharf.						
Wharf	19-4913	SW	View along the berthing face of the concrete wharf. Timber fender piles are present along the wharf.						
Wharf	19-4914	W	Underdeck view of the concrete wharf. There is less clearance under the deck.						
Wharf	19-4921	W	Underdeck view of the concrete wharf.						
Wharf	19-4922	NW	General view of the concrete wharf and timber fender system.						
Wharf and Transfer Span	19-4927	SW	View of the south end of the wharf (timber fender system) where it is contiguous with Structure #20 (fender panels)						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 19

LDW Field Survey Photographs



19-4898



19-4899



19-4901



19-4913



19-4914



19-4921



19-4922



19-4927

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: International Terminal North Wharf Parcel #: 5367202505
(Terminal 115) Facility Owner: Port of Seattle
River Mile: 1.6 to 1.8 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete piles support Facility Operator: Multiple
103-ft wide concrete apron over water. Riprap Name of Contact: _____
slope and sheet pile bulkhead on inner land side. Business Phone #: Multiple
Containerized general cargo and heavy lift items; Assessment Date/Time: 1/25/2018 10:30 AM
receipt of steel products; receipt and shipment of Team Leader: BH
forest products. _____
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Contiguous with the south end of Structure #19. Concrete pile supported wharf with concrete cap and deck. Steel transfer spans at midpoint and south end of structure. Pile spacing 20ft (bents) x 4ft rows. Steel fender panels along face berthing. Steel mono pile at south end of structure. Steel sheet pile bulkhead behind structure at shoreline. Shoreline south of wharf is partially armored with riprap. No outfalls observed. Facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

3ft clearance between cap and water at 0930 on 1/25/18. Typical concrete wharf access limitations.

Prepared By:

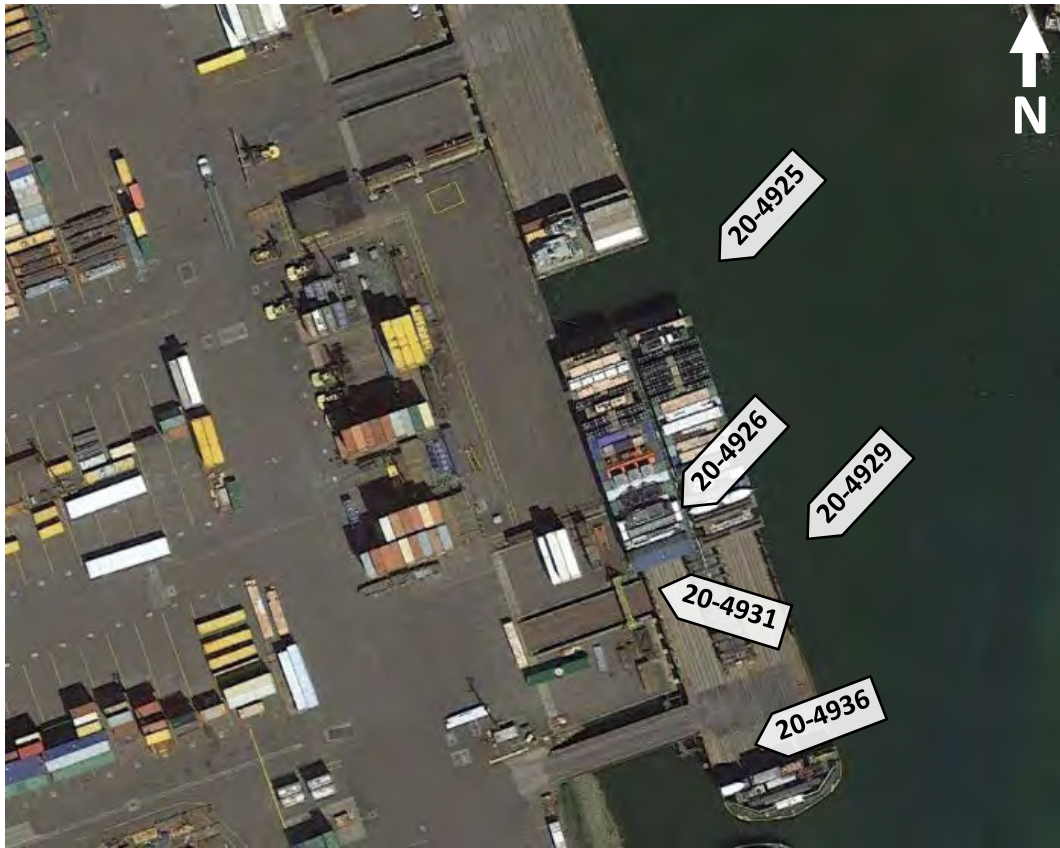


600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Wharf	20-4925	SW	General view of the structure. Structure #19 is contiguous with the north end of the wharf.						
Wharf and Transfer Span	20-4926	SW	View of the concrete wharf and transfer span.						
Wharf and Transfer Span	20-4929	SW	View of the concrete wharf and both transfer spans.						
Wharf and Transfer Span	20-4931	W	View of the concrete wharf and mid-point transfer span. Riprap and a steel sheet pile bulkhead is visible along the shoreline.						
Transfer Span and Shoreline	20-4936	W	View of the south transfer span, a steel mono pile dolphin at the south corner, and the shoreline protected with scattered riprap.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 20

LDW Field Survey Photographs



20-4925



20-4926



20-4929



20-4931



20-4936

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Glacier Northwest Slip 2 Wharf

Parcel #: 1924049075

Facility Owner: Glacier Northwest, Inc.

River Mile: 1.7, north side Slip 2 Side: East

Business Phone #: Unknown

Structure Type(s)/Use(s): Steel pipe pile dolphins,
steel transer span, and timber-pile,

Facility Operator: Glacier Northwest (CalPortland)

timber-decked wharf. Receipt of sand and gravel.

Name of Contact: _____

Business Phone #: 206-764-3036

Assessment Date/Time: 1/11/2018 12:00PM

Team Leader: BH

Structure was Identified during 2012 Feasibility
Study (Y/N): Y

Assessment Personnel: SS

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Barge dolphin berth with 6 steel pipe pile dolphins and a central steel pile supported conveyer system on a transfer span. The 3-pile dolphins have one ~24" plumb pile, two ~12" batter piles, and large tires around the plumb pile. A small timber wharf is located just to the east of the transfer span and has approximately 5-foot pile spacing. The shoreline is steep (~2V:1H) and protected with medium riprap. There is a concrete bulkhead at the top of slope for the transfer span. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Upland access limited due to equipment and conveyers directly behind berth. Most of the shoreline is protected with riprap or a concrete bulkhead. Deeper into the inlet is better upland access with medium riprap shoreline and approximately a 1:1 slope.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/11/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/11/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall / Shoreline	21-3365	NE	Barge dolphin berth, transfer span, and riprap-protected shoreline.						
Utility Pipe	21-3366	N	Pipe protruding from the concrete bulkhead into the waterway to the SW of the transfer span						
Dolphins and Transfer Span	21-3368	NE	Typical condition of the steel pipe pile dolphins and transfer span.						
Transfer Span and Supporting Structure	21-3371	N	Conveyor system mounted on a steel-pile supported transfer span. The small timber wharf is visible to the right of the transfer span abutment.						
Dolphins and Transfer Span	21-3372	W	Typical condition of the steel pipe pile dolphins and transfer span.						
Dolphin and Shoreline	21-3374	NE	Furthest east dolphin and riprap protected shoreline.						
Shoreline and Pile Stubs	21-5439	NE	Riprap protected shoreline. A timber pile stub and a group of four timber pile stubs are located at on the north shoreline of the entrance to Slip No. 2.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

LDW Field Survey Photographs

STRUCTURE 21



21-3365



21-3366



21-3368



21-3371



21-3372



21-3374



21-5439

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: South Wharf (Terminal 115)

Parcel #: 5367202505

River Mile: 1.8 Side: West

Facility Owner: Port of Seattle

Structure Type(s)/Use(s): Two timber pile,

Business Phone #: Unknown

timber-decked finger piers with concrete

Facility Operator: Alaska Marine Lines

abutements. Containerized general cargo and

Name of Contact: _____

heavy lift items.

Business Phone #: 206-439-5490

Assessment Date/Time: 1/25/2018 10:30 AM

Structure was Identified during 2012 Feasibility

Team Leader: BH

Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Two timber finger piers with timber piles, caps and deck. 10ft bent spacing x 4 ft row spacing. Steel transfer span between platforms. Steel pile structures north and south of transfer span, 4 piles each support transfer span. Shoreline is armored with riprap, sloped at 2:1. No outfalls observed. The structure is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Limited accessible due to moored barge and mooring lines. 3ft clearance between water and pile caps at 0950 on 1/25/18.

Prepared By:

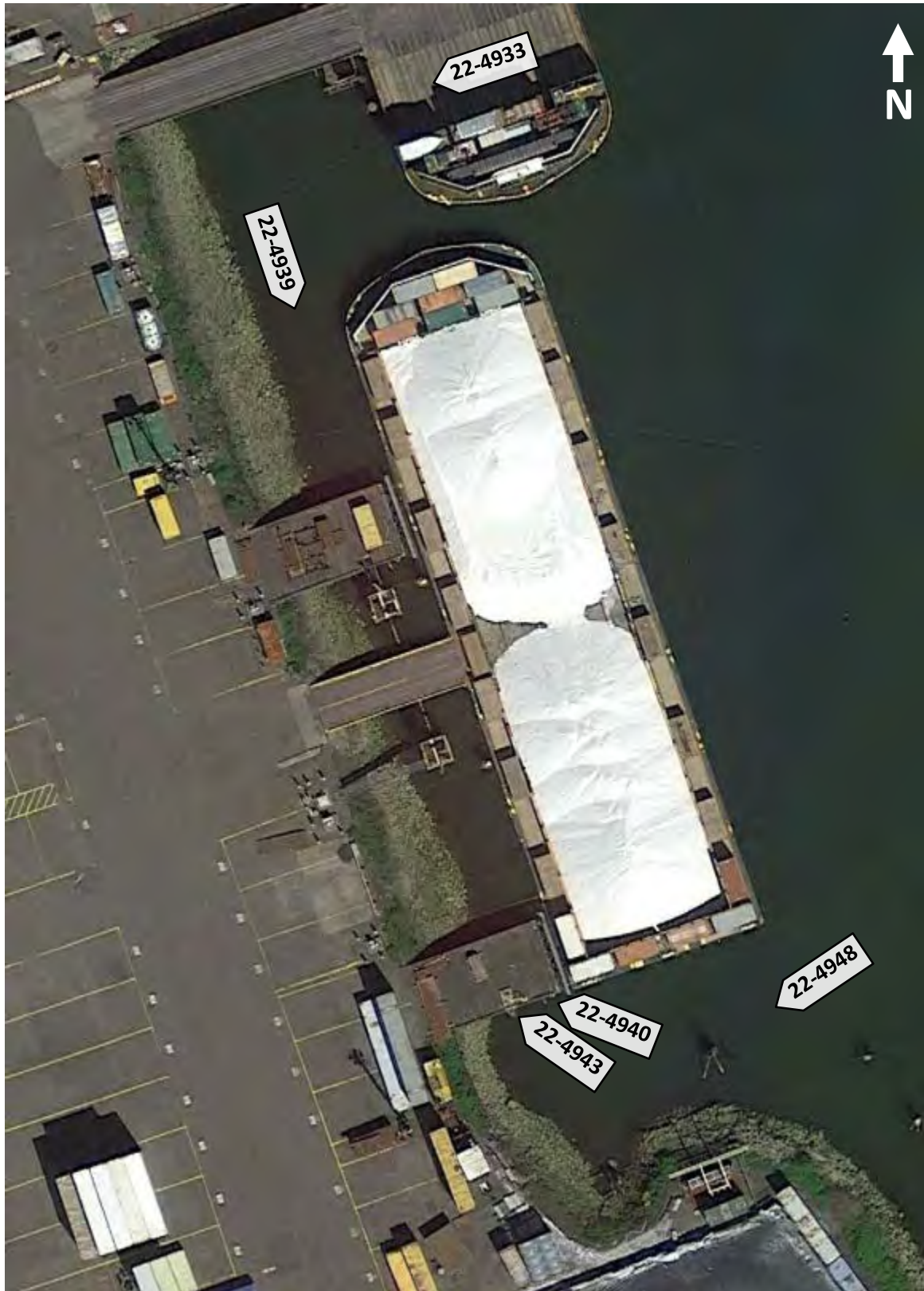


600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Shoreline	22-4933	W	View of the riprap-protected shoreline to the north of the structure.						
North Pier	22-4939	S	View of the north side of the north timber pier.						
South Pier	22-4940	NW	View of the south side of the south timber pier.						
South Pier	22-4943	NW	Underdeck view of the south timber pier.						
South Shoreline	22-4948	W	View of the shoreline south of the structure. The shoreline is riprap protected. South of the structure is a 4-pile timber dolphin, a 3-pile steel dolphin, and single steel pile. There is also an unknown shoreline feature along the south shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 22

LDW Field Survey Photographs



22-4933



22-4939



22-4940



22-4943



22-4948

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Filter Engineering Wharf

Parcel #: 5367204565

Facility Owner: Individual Owner

River Mile: 1.8, south side Slip 2 Side: East

Business Phone #: Unknown

Structure Type(s)/Use(s): Steel/timber pile pier,

Facility Operator: Duwamish Marine Center/

concrete piers, and floating docks. Moving

Filter Engineering

construction equipment to and from barges and

Name of Contact: _____

moorage.

Business Phone #: 206-992-9437

Assessment Date/Time: 1/11,17/2018 12:30 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility

Assessment Personnel: SS, HL

Study (Y/N): Y

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The facility is comprised of four waterfront structures: one T-head pier, two single-span piers, and floating docks. All structures appear operational. The T-head pier is constructed with steel piles, pile caps, and two large girders on the approach portion of the pier. Two timber pile supported aprons flank the approach making the T-pier shape. The timber piles are 12"-14" on 10'x12' spacing. The pier is faced with timber fender piles. Two breasting dolphins are on either side: a 7-pile steel dolphin is to the east and a 4-pile steel dolphin is to the west. The shoreline is near vertical on the east shore and appears to be concrete poured around cinderblock and brick rubble. The south shoreline is protected with concrete rubble. A timber stub is present to the west of the T-head pier.

The two single-span piers are identified as the north-central pier and the south-central pier. Both piers span from an abutment to a concrete pile cap supported by concrete plum and battered octagonal piles. The timber deck is supported on steel beams. A 14-pile timber dolphin is to the north of the two piers. A pile field of approximately 50 piles is between the two piers. The facility is operational.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101

M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/17/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/11,17/2018

The floating dock area includes guide piles, gangways, and boathouses. A pile field is present between the shoreline and the floating docks with approximately 100 piles. A large amount of debris has accumulated within the pile field. The shoreline is protected with concrete rubble and the slope is almost vertical.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Upland is open (parking lot) on the east side of facility. A raft of plastic pipes is tied up between the T-head pier and east dolphin. There are widespread timber pile stubs and pile fields at the facility.

There is limited access in the vicinity of the floating docks because of clearance between structures, gangways extending from the shore, and piles stubs.

3. STRUCTURE VICINITY MAP (CONTINUED ON NEXT PAGE):





4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments
East Pier Structure	23-3385	W	View of the east side of the eastern pier structure and the east 7-pile steel dolphin.
East Shoreline	23-3386	W	View of the east shoreline. The shoreline is protected with concrete rubble and is vegetated.
East Pier Structure	23-3884	N	View of the timber pile supported pier structure.
East Shoreline	23-3886	W	View of the east shoreline. The shoreline is protected with concrete rubble and is vegetated.
East Pier Structure	23-3888	SE	View of the timber pile supported pier structure.
Central Shoreline	23-3891	S	View of the central shoreline. The shoreline is protected with concrete rubble and is vegetated.
East Pier Structure	23-3903	NE	View of the steel beam pier approach supported by steel pile caps and steel piles. A timber pile stub was present to the west of the approach.
East Pier Structure and Dolphin	23-3910	NE	View of the east pier structure and the 4-pile steel dolphin to the west.
Central Shoreline	23-3913	S	Along the central shoreline is a 50-foot-long area of unprotected sandy shoreline.
North-Central Pier	23-3917	S	View of the north side of the single-span concrete pile supported north-central pier. The shoreline is protected with concrete rubble and numerous timber pile stubs are present along the shoreline.
Timber Pile Stub Field	23-3919	S	Between the north-central pier and the south-central pier is a pile field.
Timber Dolphin	23-3923	W	North of the north-central pier is a 14-pile timber dolphin.
South-Central Pier	23-3941	NE	View of the south side of the single-span concrete pile supported south-central pier. Timber pile stubs are present south of the pier and along the shoreline.
Floating Docks	23-3935	S	View of the floating docks on the south end of the facility. The floating docks are kept in place by various timber piles and timber dolphins. The shoreline is protected with concrete rubble. The floats create moorage for multiple tug boats and boat houses.
Floating Docks	23-3950	S	View of the floating dock walkway. Numerous timber pile stubs are located between the shoreline and the walkway.
South Shoreline	23-3953	SE	View of the south shoreline along the floating docks. A derelict timber bulkhead is present along the shoreline.
Timber Pile Field	23-3959	S	View of the timber pile field and debris between the shoreline and the floating dock walkway.

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/11,17/2018

Element	Photo No.	Direction	Description / Comments						
Floating Docks	23-3961	N	View of the floating dock and the timber pile field and debris between the shoreline and the floating dock walkway.						
South Shoreline	23-3974	NE	View of the concrete-rubble protected shoreline south of the floating docks. A small building with a concrete bulkhead is present on the shoreline.						
South Shoreline	23-3977	SE	View of the concrete bulkhead behind the floating docks and the timber pile field.						
Boat Houses	23-3979	E	View of the boat houses along the floating docks.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 23

LDW Field Survey Photographs



23-3385



23-3386



23-3884



23-3886



23-3888



23-3891



23-3903



23-3910



23-3913



23-3917



23-3919



23-3923



23-3935



23-3941



23-3950



23-3953



23-3959



23-3961



23-3974



23-3977



23-3979

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Seafreeze Limited Partnership Wharf Parcel #: 5367202505
(Terminal 115) Facility Owner: Port of Seattle
River Mile: 1.9 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete- Facility Operator: Lineage Logistics (SeaFreeze)
decked offshore wharf with concrete approach, Name of Contact: _____
steel catwalks, and steel pile dolphins. Receipt of Business Phone #: 253-313-4661
fish and seafood. Assessment Date/Time: 1/25/2018 11:00 AM
_____ Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Seven steel 3-pile dolphins along north end of structure (1 of 7, northernmost, is set towards shore).
Main structure is concrete pile supported marginal wharf (20ft x 20ft pile spacing) with timber fender piles (10ft spacing). Steel catwalks extend north and south from structure to timber piles. North end has timber dolphin cluster. Shoreline is vegetated with riprap at 1:1. Small dia. outfall north of catwalk. Facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

5ft clearance from water to pile caps, batter pile restrict access between bents at north and south end.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Shoreline	24-4945	S	View of the riprap-protected shoreline and the steel dolphin berth.						
Dolphins	24-4952	SW	View of the 3-pile steel dolphins.						
Shoreline	24-4954	W	View of the vegetated, riprap-protected shoreline.						
T-Head Pier	24-4957	NW	View of the berthing face of the T-head concrete pier. Timber fender piles line the berthing face.						
T-Head Pier	24-4960	W	Underdeck view of the T-head concrete pier.						
Shoreline	24-4963	W	View of the riprap-protected shoreline south of the structure.						
T-Head Pier	24-4964	N	View of the south end of the T-head pier.						
Shoreline and T-Head Pier	24-4966	N	View of the south end of the T-head pier and the riprap-protected shoreline.						
T-Head Pier	24-4970	W	View of the north end of the T-head pier. A 9-pile timber dolphin is present at the north end of the pier.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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STRUCTURE 24

LDW Field Survey Photographs



24-4945



24-4952



24-4954



24-4957



24-4960



24-4963



24-4964



24-4966



24-4970

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Alaska Marine Lines Dock No. 2 Parcel #: 2924049090

Facility Owner: 7100 1St Ave S Seattle L L
River Mile: 2.1 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete- Facility Operator: Alaska Marine Lines
decked wharf. Containerized general cargo; Name of Contact: _____
mooring vessels. Business Phone #: 206-439-5490

Assessment Date/Time: 1/25/2018 2:00 PM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete wharf with concrete piles (20ft x 8ft spacing) and concrete pile cap and deck. Timber dolphin cluster to the north. Steel sheet pile bulkhead along shoreline. Steel fender piles along face of structure at 10ft spacing. Two concrete bulkhead structures along shoreline, south of main wharf, approx. 50ft long each. Steel mono-pile dolphins south of wharf (6 total to the south). Two mono piles have timber dolphin clusters immediately adjacent. The furthest south dolphin has two steel piles. Shoreline is armored with riprap/concrete debris and is partially vegetated at 1:1 sloped. No outfalls observed. Facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Moored barge prevents inspection access along berthing face of wharf. Timber pile stubs (approx. 20 piles) along south shoreline between 5th and 6th monopile dolphins. Two concrete bulkheads along south shoreline, approx. 50ft each. Two timber pile stubs along north shoreline, 50ft north of

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TEAM LEADER INITIALS: **BJH**

DATE: **1/25/2018**

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

structure at waterline (at 1245 on 1/25/18). Shoreline to the south has additional pile stub fields clustered in a group of approx. 20 piles and 50 piles.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Pier	25-5010	SE	View of the north side of the concrete wharf.						
Shoreline	25-5011	S	View of the concrete-rubble protected shoreline north of the structure.						
Shoreline	25-5012	W	View of the concrete-rubble protected shoreline north of the structure. Two timber pile stubs are present north of the structure.						
Overall	25-5016	SE	Overall view of the north side of the structure. A 9-pile timber dolphin is located on the north end of the berth.						
Dolphin and Pier	25-5029	NW	View of the south side of the concrete wharf and one of the steel mono pile dolphins.						
Shoreline	25-5030	SW	View of the riprap and concrete-rubble protected shoreline.						
Platform	25-5034	S	A small concrete platform is present along the shoreline south of the wharf behind the dolphins.						
Dolphins and Shoreline	25-5035	SE	View of the dolphin berth and riprap-protected shoreline.						
Pile Field	25-5036	SE	A field of timber pile stubs is present along the shoreline south of the structure.						
Overall	25-5038	NE	Overall view from the south of the dolphins, shoreline, and concrete wharf.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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STRUCTURE 25

LDW Field Survey Photographs



25-5010



25-5011



25-5012



25-5016



25-5029



25-5030



25-5034



25-5035



25-5036



25-5038

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Northland Services Fox Avenue Parcel #: 0001800104, 0001800128
Terminal Wharf Facility Owner: Seatac Marine Properties, LLC
River Mile: 2.1 to 2.2 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete- Facility Operator: Delta, Glacier Marine Services
decked wharf extending from sheet pile Name of Contact: _____
bulkhead. Conventional and containerized Business Phone #: 206-767-7000
general cargo. Assessment Date/Time: 1/17/2018 4:30 PM
_____ Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: HL
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The facility is on the south shoreline of Slip 3 and extends south along the waterway's east shoreline. A configuration of concrete wharfs, aprons, and a long finger pier make up a vessel slip. The construction is a concrete deck and pile caps supported by 18-inch-square and octagonal concrete piles at 5'x15' spacing. The berthing faces are lined with timber fender piles at 10 foot spacing. On the east end of the facility within Slip 3 is a timber dock with deteriorated piles and a tall steel wall above. Three 14-pile timber dolphins are present approximately 100 feet outboard of the vessel slip. A small floating dock on the outboard end of the finger pier is accessed by a gangway. The shoreline is protected with concrete rubble and is vegetated. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Low underdeck clearance will limit access at high tides. The south end of the facility has a 50-foot-long steel wall at the berth face (the water level limited more information).

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TEAM LEADER INITIALS: BJH

DATE: 1/17/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
East Shoreline	26-4069	E	The east shoreline is protected by concrete rubble and is vegetated.						
East Timber Dock	26-4077	S	A small timber dock is located at the east end of the facility within Slip 3. A tall steel wall is installed around the perimeter of the dock.						
Finger Pier	26-4082	SE	View of the concrete finger pier with timber fender piles.						
Timber Dolphin	26-4084	S	View of the 14-pile timber dolphin outboard of the finger pier.						
Timber Dolphins	26-4091	S	View of the three 14-pile timber dolphins outboard of the facility. The small floating dock is visible on the left side of the photograph.						
Finger Pier	26-4101	E	View of the west end of the finger pier and small floating docks.						
Wharf	26-4115	SE	View of the concrete wharf that forms the south side of the vessel slip.						
South Shoreline an Dolphin	26-4127	SE	The south shoreline is protected with isolated pieces of concrete rubble and is vegetated. A 14-pile timber dolphin is present approximately 100 feet outboard of the south end of the facility. A steel wall is present under the wharf on the south end.						
Wharf	26-4130	NE	View of the concrete wharf and timber fender piles.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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STRUCTURE 26

LDW Field Survey Photographs



26-4069



26-4077



26-4082



26-4084



26-4091



26-4101



26-4115



26-4127



26-4130

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Silver Bay Logging South River Street
Wharf and Other Miscellaneous Structures

Parcel #: 5367204200, 5367204160, 5367204100

Facility Owner: Muckleshoot Tribe USA in Trust,
Rainier Petroleum Corporation, Westcore River
Street LLC

River Mile: 2.1, north side Slip 3 Side: East

Business Phone #: Unknown

Structure Type(s)/Use(s): Silver Bay - Timber pile,
timber-decked wharf extending from timber
bulkhead. Mooring barges.

Facility Operator: Silver Bay Logging, Rainier
Petroleum Corporation, Westcore River Building

Rainier Petroleum – Floating dock and boat house.

Name of Contact: _____

Westcore River – Pile supported building and
dolphins for a barge berth.

Business Phone #: 503-973-0651(Muckleshoot),
916-236-4293 (Westcore)

Assessment Date/Time: 1/17/2018 3:00 PM

Structure was Identified during 2012 Feasibility

Team Leader: BH

Study (Y/N): The Rainier Petroleum and

Assessment Personnel: HL

Westcore River Facilities are added.

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The subject structures are on the north shoreline of Slip 3. Three structures from separate parcels are combined on this field book. The western structure is a combination of a contiguous concrete wharf and timber wharf and a floating L-shaped dock. The concrete wharf is supported by 18-inch octagonal piles at 10'x10' spacing. The timber wharf is supported by timber piles at 5'x10' spacing. The floating dock is stabilized by six concrete guide piles. An additional isolated concrete pile is located to the east of the floating dock. The floating dock extends along the face of the concrete and timber wharves. The shoreline behind the concrete wharf is protected by medium sized riprap and behind the timber wharf is a bulkhead. To the north, the shoreline is protected by concrete rubble and a boat ramp is present.

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TEAM LEADER INITIALS: BJH

DATE: 1/17/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/17/2018

The central structure is a floating timber dock with integrated boat house. The guide piles are timber piles and a group of four steel piles at the SE corner. The shoreline is a timber-pile bulkhead.

The east structure is a timber pile supported building and 7 18" diameter mono pile dolphins for a barge berth. The building pile spacing is 20'x10'. The pile caps and bulkhead are concrete. To the southeast of the building is a steel sheet pile wall with timber fender piles. The east shoreline is protected with concrete blocks and is vegetated at the top of bank. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Access under the concrete and timber wharves is restricted because of the floating dock along the berthing face and the pile spacing. There is low underdeck clearance below the east building.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Floating Dock	27-3996	S	View of the concrete floating dock and concrete guide piles.						
North Shoreline and Concrete Wharf	27-3997	N	View of the riprap protected north shoreline, the boat ramp, and the west face of the concrete wharf.						
Concrete Wharf	27-3999	SE	Underdeck view of the concrete wharf.						
Floating Dock	27-4005	E	View of the floating concrete dock along the berthing face of the concrete and timber wharves. The isolated concrete pile is visible beyond the floating dock.						
Timber Wharf	27-4026	N	Underdeck view of the timber wharf.						
Timber Wharf	27-4034	N	View of the east end of the timber wharf and a steel sheet pile bulkhead to the east of the wharf.						
Timber Wharf	27-4041	NW	View of the timber wharf.						
Floating Dock	27-4037	NW	View of the floating dock and integrated boat house. The pile supported building is in the background.						
Pile Supported Building	27-4048	N	Underdeck view of the pile supported building.						
Pile Supported Building	27-4051	E	View along the face of the pile supported building.						
Pile Supported Building	27-4055	E	View along the face of the pile supported building.						
Steel Sheet Pile and Timber Pile Wall	27-4062	W	View of the steel sheet pile and timber pile wall that is faced with timber fender piles.						
East Shoreline	27-4066	S	View of the east shoreline. The shoreline is vegetated and has isolated riprap.						
Dolphin Barge Berth	27-4068	NE	View of the seven steel mono pile dolphins. The sheet pile wall and building are beyond.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 27

LDW Field Survey Photographs



27-3996



27-3997



27-3999



27-4005



27-4026



27-4034



27-4037



27-4041



27-4048



27-4051



27-4055



27-4062



27-4066



27-4068

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Boyer Alaska Barge Line Mooring Parcel #: 6871200620

River Mile: 2.3 Side: West Facility Owner: Boyer Towing Inc.

Structure Type(s)/Use(s): Two offshore breasting Business Phone #: Unknown
dolphins fronting natural bank. Mooring floating Facility Operator: Boyer Towing Inc.
equipment. Name of Contact: _____

Business Phone #: 206-841-8100

Assessment Date/Time: 1/25/2018 2:00 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Two timber dolphin clusters. Facility is operational. Shoreline is armored with concrete debris and riprap at 2:1 slope. No outfalls observed.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

No observed restrictions.

Prepared By:

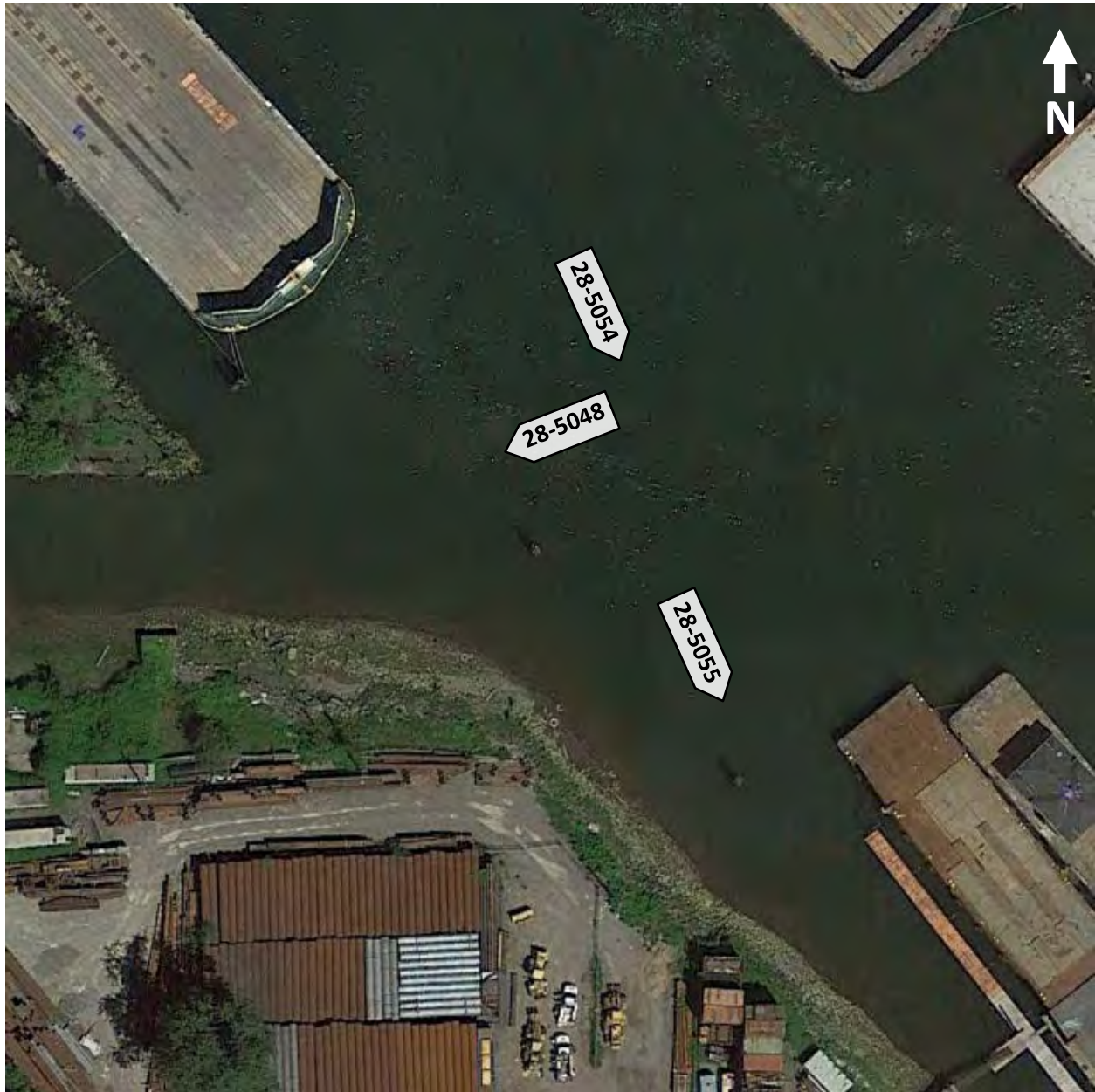


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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



STRUCTURE 28

LDW Field Survey Photographs



28-5048



28-5054



28-5055

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: MC Halverson Marina

Parcel #: 6871200350

River Mile: 2.3 Side: West

Facility Owner: Boyer Towing Inc.

Business Phone #: Unknown

Structure Type(s)/Use(s): Floating docks. Barge and vessel moorage.

Facility Operator: Boyer Towing

Name of Contact: _____

Business Phone #: 206-841-8100

Assessment Date/Time: 1/25/2018 2:00 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: AP

1. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Plastic float system with steel raised decking and timber guide piles (30ft spacing). Floats are connected to shore by a steel gangway and timber trestle. Trestle piles spaced at 20ft x 10ft. Facility is operational as a barge berth. This is a change from the previous use as a marina (fingers of the floating dock have been removed). The shoreline is armored with concrete and riprap debris, approx. 2:1 slope. No outfalls observed.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

None observed

Prepared By:

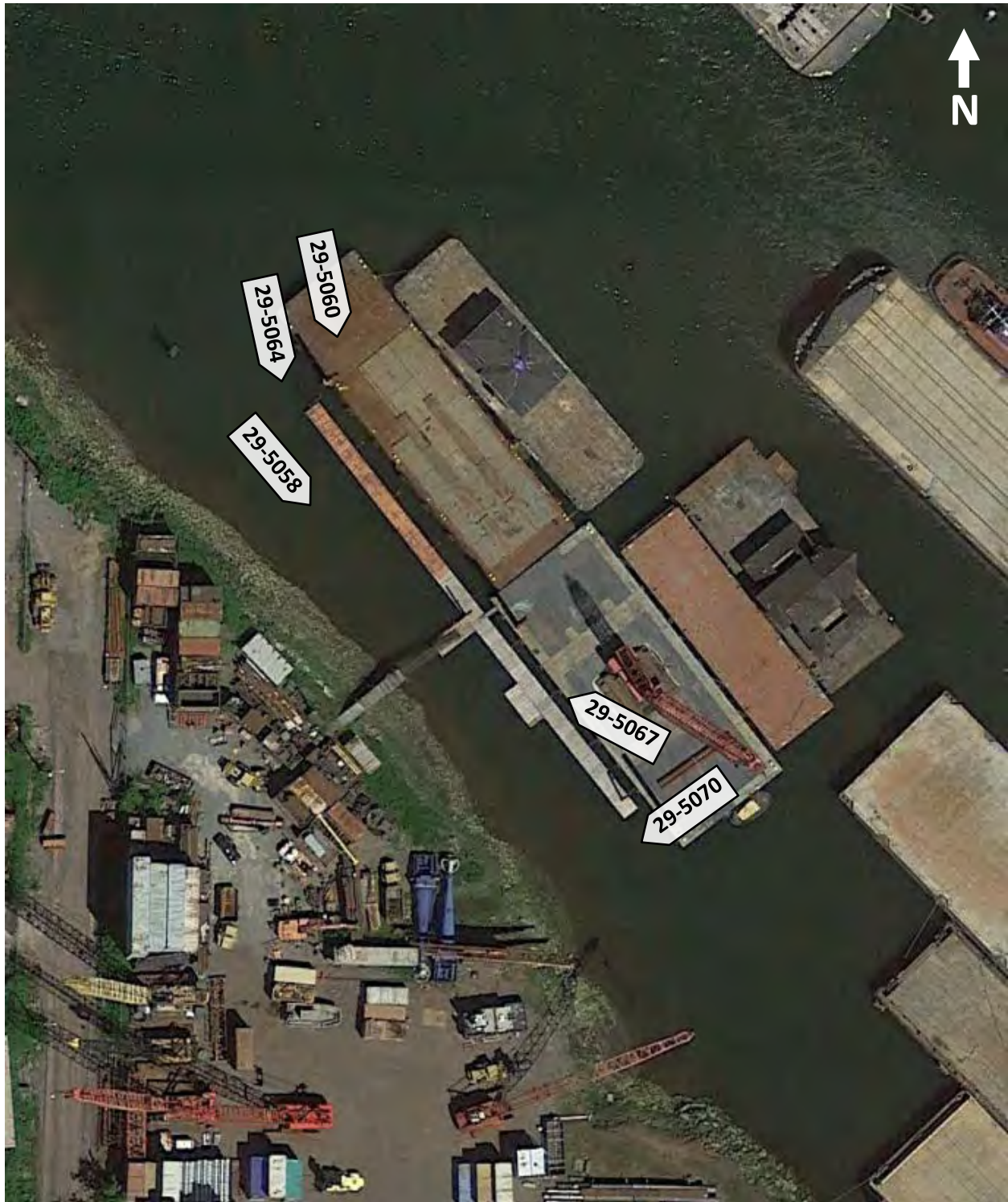


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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

2. STRUCTURE VICINITY MAP:



3. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Access Pier	29-5058	SE	View of the timber access pier and gangway along the shoreline.						
Floats	29-5060	S	View of the miscellaneous floats secured at the site.						
Floats	29-5064	SE	View of the miscellaneous floats secured at the site.						
Floats	29-5067	N	View of the miscellaneous floats secured at the site.						
Shoreline	29-5070	SW	View of the riprap and concrete rubble protected shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 29

LDW Field Survey Photographs



29-5058



29-5060



29-5064



29-5067



29-5070

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Seattle Iron & Metals Wharves

Parcel #: 2136200706

River Mile: 2.4/2.5 Side: East

Facility Owner: Shalmar Group LLC

Business Phone #: Unknown

Structure Type(s)/Use(s): Timber pile, asphalt-surfaced, timber-decked wharf extending from steel sheet pile bulkhead. Receipt of scrap metal by barge.

Facility Operator: Seattle Iron and Metals

Name of Contact: _____

Business Phone #: 206-396-0569

Assessment Date/Time: 1/18/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: SS

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Two timber wharves are present at the facility. The north timber wharf (Structure 30) is constructed with timber piles and deck and have very tight pile spacing of ~3' x 5'. Two timber pile cluster dolphins are present off the north end, and 1 timber/steel pipe pile (4 steel & 1 timber) cluster dolphin off the south end. Concrete rubble shore protection with a slope of 1V:1H to 1V:2H. A containment boom is around the wharf. 3 derelict piles in the water off the NE corner of the wharf behind the berthing line. Bulkhead along the shore side of the wharf consisting of horizontal prestressed concrete octagonal piles used as lagging for a soldier pile wall. 1 derelict steel pile and 1 timber pile (5 or 6 pile) cluster dolphin on the SE side of the wharf between berthing line and shore.

The south timber wharf (Structure 32) is constructed with timber piles and deck and have a pile spacing of ~3'x10' spacing. There is a steel sheet pile bulkhead with riprap in front of the wall. A 2-pile timber dolphin is located off the N end of the wharf just behind berthing face. A large outfall is just N of the wharf. The shoreline is steep (1V:1H) with concrete rubble protection to N of the bulkhead wall

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DATE: 1/18/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

on N end of wharf. The S shoreline is a steep clay bank transitioning into concrete rubble slope ~ 1:1 slope. 4 misc piles are located south of wharf.

Both facilities are operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The overwater structures have very tight pile spacing. Various pile caps on the south wharf are in a failed state. Isolated timber pile stubs are located between the two structures.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Wharf	30-4173	E	Underdeck view of the timber wharf and concrete-pile bulkhead.						
Central Shoreline	30-4176	S	Concrete-rubble protected shoreline and timber piles/dolphins between the two structures.						
North Wharf	30-4178	N	View of the south face of the north timber wharf.						
North Wharf	30-4181	NE	Overall view of the north wharf and the timber dolphins to the north of the structure.						
South Wharf	30-4186	E	Underdeck view of the south timber wharf and steel sheet pile bulkhead.						
Outfall	30-4188	E	Outfall to the north of the south wharf.						
South Wharf and Shoreline	30-4194	E	View of the south end of the south wharf and the unprotected south shoreline.						
South Wharf	30-4195	N	Overall view of the south wharf.						
South Wharf	30-4200	E	Underdeck view of the south wharf with isolated locations of failed timber pile caps.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 30/32

LDW Field Survey Photographs



30-4173



30-4176



30-4178



30-4181



30-4186



30-4188



30-4194



30-4195



30-4200

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Boyer Alaska Barge Line Seattle Wharf Parcel #: 6871200210

River Mile: 2.4 Side: West Facility Owner: Boyer Towing Inc.
Structure Type(s)/Use(s): Timber bulkhead, Business Phone #: Unknown
asphalt surfaced timber pile, concrete-decked Facility Operator: Boyer Alaska Barge Line
wharf with transfer span. Containerized general Name of Contact: _____
cargo, lumber, mooring tugs and barges. Business Phone #: 206-841-8100

Assessment Date/Time: 1/25/2018 2:30 PM
Structure was Identified during 2012 Feasibility Team Leader: BH
Study (Y/N): Y Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber pile supported wharf structure with concrete cap and deck. Off the north end is a transfer span. Three 3-pile steel dolphins north of wharf and two dolphins south of the wharf. Shoreline is armored with concrete debris and riprap at 2:1 slope. Facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Access to dolphins restricted by shallow water for inspection. Moored vessels and mooring lines restrict access to all of structure.

Prepared By:

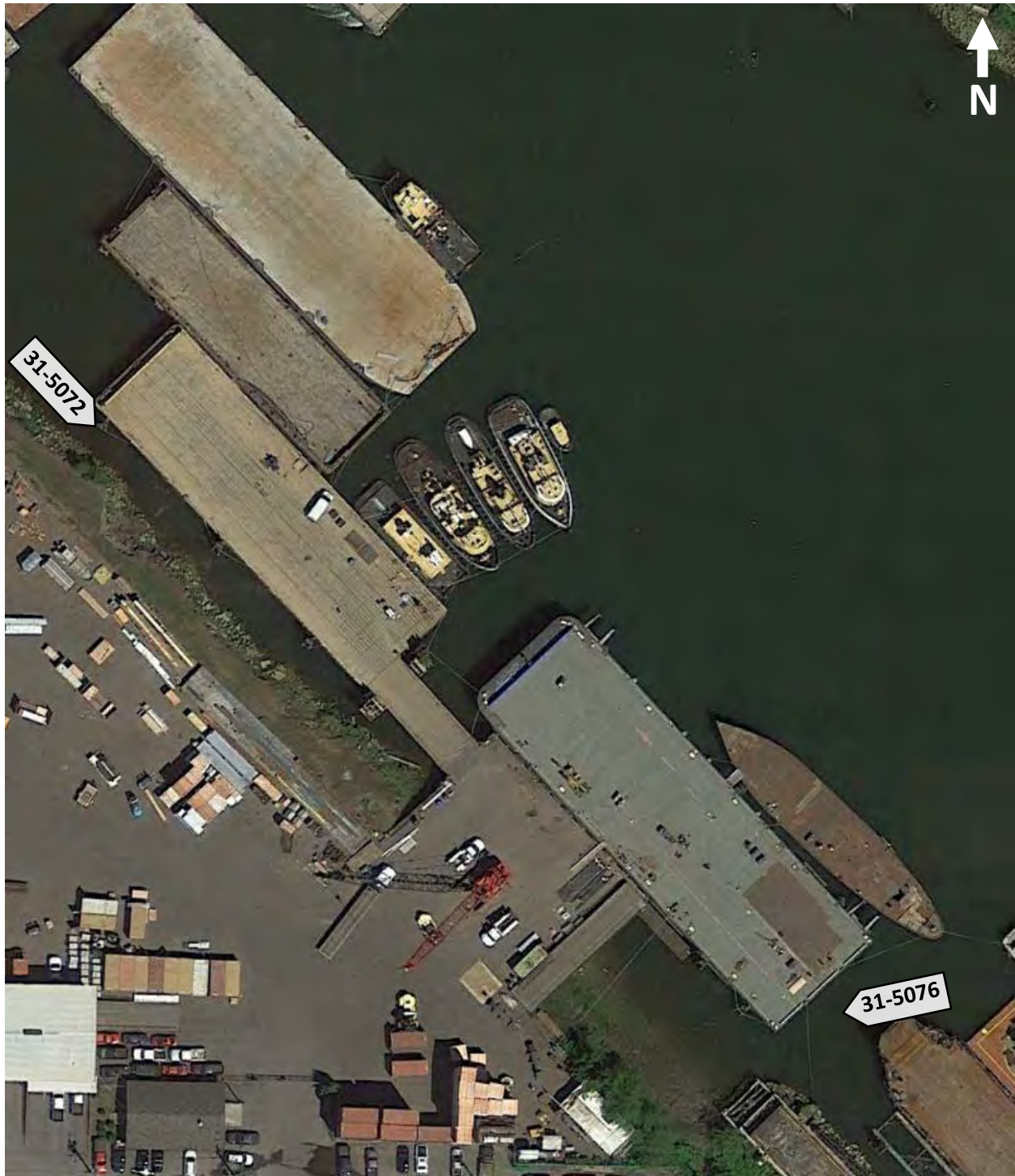


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TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



STRUCTURE 31

LDW Field Survey Photographs



31-5072



31-5076

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Alaska Washington Building Materials Parcel #: 7327906685, 7327906645, 7327906755
Co. Wharf Facility Owner: Varies
River Mile: 2.5 Side: West Business Phone #: Varies
Structure Type(s)/Use(s): Irregularly shaped Facility Operator: Varies
concrete and timber bulkhead with solid fill, Name of Contact: _____
fronted by three timber dolphins. Barge and Business Phone #: Varies
vessel moorage. Assessment Date/Time: 1/25/2018 3:00 PM
_____ Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Three timber dolphin clusters with a steel open framed float. Facility operational capacity is unknown, but appears operational only for mooring. Shoreline has concrete debris, concrete blocks and timber bulkhead. No outfalls observed. It appears an over-water structure that was previously shown on the parcel map is no longer present.

South of the facility are additional in-water features. A timber ramp extends from shore into waterway north of a moored barge. The barge is moored to two steel guide piles that may be the barge spuds. A steel transfer span extends from shore to barge. Portion of shoreline is a concrete block wall. Remaining shoreline is stabilized with concrete blocks and debris. South of transfer span and barge are floats for small vessels. Floats are attached to two steel guide piles. At the far south end is a timber floating dock that appears to be for private use.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

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M&N JN: 9573

TEAM LEADER INITIALS: **BJH**

DATE: **1/25/2018**

Dolphin clusters and float restrict access to shoreline. Partially submerged steel float extends from shore north of facility. Offshore end of float is submerged.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Dolphins	33-5077	SE	Overall view of the timber dolphins and the timber bulkhead along the shoreline.						
Bulkhead	33-5078	S	View of the timber bulkhead along the shoreline.						
Bulkhead and Shoreline	33-5082	SW	View of the north end of the facility. A group of 5 timber pile stubs is present to the north.						
Shoreline	33-5084	SW	View of the concrete block bulkhead along the shoreline.						
Dolphins and Bulkheads	33-5085	N	Overall view of the timber dolphins, timber bulkhead, and concrete bulkhead along the shoreline.						
Ramp	33-5086	S	View of a timber ramp extending from the shoreline.						
Bulkhead	33-5087	S	View of the concrete block bulkhead along the shoreline.						
Floats	33-5092	SE	South of the facility is a group of floats, a transfer span, and a barge permanently moored with its spuds.						
Float	33-5093	W	Partially sunk float along the shoreline.						
Transfer Span	33-5097	W	View of the transfer span extending from the shoreline to the barge. The shoreline is protected with gravel and riprap.						
Floats	33-5101	S	At the south end of the facility is a grouping of floats that create moorage for personal vessels.						
Floats	33-5104	SW	At the south end of the facility is a grouping of floats that create moorage for personal vessels. The floats are anchored by two central steel piles.						
Floating Dock	33-5105	SW	At the south end of the facility is a floating dock that appears to be for private use. The shoreline is a concrete bulkhead.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 33

LDW Field Survey Photographs



33-5077



33-5078



33-5082



33-5084



33-5085



33-5086



33-5087



33-5092



33-5093



33-5097



33-5101



33-5104



33-5105

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Hurlen Construction Mooring

Parcel #: 7327905725

River Mile: 2.65 Side: West

Facility Owner: Six Twenty South Logistics

Structure Type(s)/Use(s): Timber pier and dolphins. Mooring floating equipment, moving supplies to and from barges.

Business Phone #: Unknown

Facility Operator: Pacific Pile and Marine

Name of Contact: _____

Business Phone #: 206-300-1312

Assessment Date/Time: 1/25/2018 3:00 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber pier with timber piles and pile caps, 20ft bent spacing and 8ft row spacing. Two timber dolphin clusters and three steel pile dolphins to the south. Concrete float tied to face of pier. Shoreline stabilized with concrete debris and riprap. Shoreline slope at 2:1. No outfalls observed. Pile stub field along south shoreline. Facility operation unknown.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Piles restrict access to south shoreline. Cross bracing between bents restrict access beneath pier.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Pier	34-5107	SW	View of the timber pier and the float along the pier face.						
North Shoreline	34-5109	W	View of the concrete-rubble protected shoreline to the north of the facility.						
Pier and Floats	34-5111	NW	View of the south side of the pier, the timber breasting dolphins, and the floats.						
Dolphins and Floats	34-5117	S	Mono pile steel dolphins with attached floats are present south of the facility.						
South Shoreline	34-5122	W	View of the south shoreline. A row of timber piles lines the shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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STRUCTURE 34

LDW Field Survey Photographs



34-5107



34-5109



34-5111



34-5117



34-5122

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Hurlen Construction Wharf

Parcel #: 7327905350

River Mile: 2.7 Side: West

Facility Owner: Hurlen Logistics, LLC

Structure Type(s)/Use(s): Timber pile,

Business Phone #: Unknown

timber-decked wharf. Mooring floating

Facility Operator: Hurlen Construction

equipment, moving supplies to and from barges.

Name of Contact: _____

Business Phone #: 206-300-1312

Assessment Date/Time: 1/25/2018 3:30 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility

Assessment Personnel: AP

Study (Y/N): Y

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber pile wharf with timber caps and decking. Pile spacing 10ft (bents) x 5ft (rows). Timber fender piles at 5ft spacing. Shoreline is armored with riprap and concrete debris. Slope of 2:1. Sheet pile bulkhead at shoreline beneath structure. No outfalls observed. Shoreline to the south appears to have had remediation, stabilized with logs chained to shore. Facility appears operational.

Includes timber pier to the north. Timber pier is approx. 10 ft wide with two pile bents and cross bracing. Pile row spacing at 10 ft. Pier does not appear operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Fender piles and cross bracing restrict access under piers. South side and berthing face are restricted by moored barges.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Pier	35-5127	NW	View of the north timber pier. A float is present on the south side of the pier.						
North Pier	35-5128	N	View of the north timber pier. A float is present on the south side of the pier.						
Wharf	35-5129	NW	View of the timber wharf.						
Wharf	35-5132	N	View of the south side of the timber wharf. The shoreline is protected with riprap.						
South Shoreline	35-5134	W	The shoreline protection transitions to concrete rubble and the top of bank is vegetated.						
South Shoreline	35-5135	W	Further south, the shoreline is protected with logs that are secured with chain.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 35

LDW Field Survey Photographs



35-5127



35-5128



35-5129



35-5132



35-5134



35-5135

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Northland Services 8th Avenue Parcel #: 2136200641
Terminal Wharf Facility Owner: DeNovo Seattle, LLC
River Mile: 2.8, north side Slip 4 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete- Facility Operator: Waste Management
decked wharf. Conventional and containerized Name of Contact: _____
general cargo. Business Phone #: 206-694-0586
_____ Assessment Date/Time: 1/18/2018 12:30 PM
_____ Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete pile supported wharf with concrete deck panels supported by octagonal prestressed concrete piles (~5-10' x 20' pile spacing). Primarily oriented E-W with a kink in the middle. Both eastern and western legs of the wharf have large notches in the deck with steel transfer spans. Off the west end are 3 dolphins (W dolphin = steel pipe monopile, middle dolphin = steel pipe pile cluster [approx. 5 steel pipe piles with 6 timber fender piles on berthing face], E dolphin = timber pile cluster [approx. 14 piles]). Behind dolphin berthing line is a steel float with steel gangway access from the wharf. Shoreline to the north/west of the wharf is a steel sheet pile bulkhead with concrete cap and chain-link fence on top. Small riprap armoring the slope in front of the bulkhead. Sheet pile bulkhead continues behind the entire wharf and extends well past the eastern end of the wharf where it appears a large section of the wharf had been removed. Eastern bulkhead terminates in a lightly armored slope ~1V:2H slope with small riprap and gravel that continues around the eastern and southern end of the cove. 2 large outfalls are present at far eastern end of cove. The northern outfall

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TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

has concrete wall and timber pile wingwalls. The southern outfall has a small concrete wingwall. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The overwater structure and steel sheet pile wall should be considered for access.

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Shoreline	36-4225	SE	View of the concrete-rubble protected shoreline to the north of the structure.						
Floating Dock	36-4228	S	A steel floating dock is present on the north end of the structure. One of the timber dolphins is visible beyond the floating dock.						
Steel Sheet Pile Bulkhead	36-4230	E	The steel sheet pile wall extends north beyond the wharf.						
Dolphins	36-4233	E	View of the dolphins and floating docks off the north end of the wharf.						
Wharf and Transfer Span	36-4236	N	View of one of the two steel transfer spans along the wharf.						
Wharf	36-4238	W	General view of the concrete wharf and steel transfer span.						
Wharf	36-4239	N	Underdeck view of the concrete wharf and steel sheet pile wall.						
Steel Sheet Pile Wall	36-4242	E	View of the steel sheet pile wall extending to the east of the wharf where it appears a structure has been removed.						
Outfall	36-4248	E	View of a large outfall to the east of the structure at the end of Slip 4.						
Outfall	36-4251	E	View of a large outfall to the east of the structure at the end of Slip 4.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
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STRUCTURE 36

LDW Field Survey Photographs



36-4225



36-4228



36-4230



36-4233



36-4236



36-4238



36-4239



36-4242



36-4248



36-4251

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Silver Bay Logging 8th Avenue Wharf Parcel #: 7327903645

River Mile: 2.9 Side: West Facility Owner: Silver Bay Logging, Inc.
Structure Type(s)/Use(s): Steel pile, steel beam, Business Phone #: Unknown
timber and steel grating decked wharf. Receipt of Facility Operator: Silver Bay Logging
lumber by barge. Name of Contact: _____

Business Phone #: 503-973-0651
Assessment Date/Time: 1/25/2018 3:30 PM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Pier and apron with steel pile and steel superstructure, 20ft x 10ft pile spacing. The apron supports a steel clad building. Timber dolphin cluster north of structure. Shoreline is armored with riprap at 2:1 slope. South portion of structure has a steel bulkhead. Shoreline access park north of structure. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Moored barge restricts inspection access to structure berthing face. Floating timber debris on south face of structure.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Pier and Apron	37-5137	S	View of the north end of the pier and apron supporting a building.						
Apron	37-5139	SW	Closeup view of the steel apron and small riprap along the shoreline.						
Pier	37-5140	S	View of the north end of the pier.						
Pier	37-5145	SW	Underdeck view of the pier.						
South Shoreline	37-5149	SW	View of the south shoreline. The shoreline is vegetated and has isolated concrete rubble protection.						
Pier	37-5151	N	View of the south end of the pier. Debris has accumulated on the south side of the pier.						
South Shoreline	37-5154	SW	Timber pile stubs line the shoreline south of the pier.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 37

LDW Field Survey Photographs



37-5137



37-5139



37-5140



37-5145



37-5149



37-5151



37-5154

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Boeing Plant 2 Parcel #: 22000005, 218000005

Facility Owner: Boeing
River Mile: 3.1 - 3.5 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Pile-supported building. Facility Operator: Boeing
Historical overwater buildings. Name of Contact: _____

Business Phone #: 425-373-8825

Assessment Date/Time: 1/18/2018 3:00 PM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Parking lots (both north and downstream ends) and building are on a pile supported apron with timber piles and a concrete deck. The front face of the platform has timber fender piles and timber lagging along its entire length. Slope behind lagging is protected with concrete rubble, slope in front of the lagging is riprap and concrete rubble, slope angle hard to determine as the slope was submerged. Timber pile cluster dolphin on N (downstream) end of shoreline (approx. 20 piles total in the dolphin), Misc single piles along the north shoreline - 3 total (for fish net 73, 72, and 70). Shoreline consists of gravel and cobble "armor" at ~1V:2H. At the pile for fish net 70 the slope transitions to a small sized riprap slope at ~1V:1H. Large outfall at the north end of the Boeing building. Outfall at far S end, just north (downstream) of bridge. Smaller outfall south of bridge. Outfall comes out of small sheet pile bulkhead with 6 timber piles slightly offshore. Shoreline continues south of bridge ~1V:2H slope armored with small riprap. Shoreline between bridge and bend in river looks recently remediated. At bend in river (at property line between Boeing and Star Forge) short length of steel sheet pile wall,

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

with small riprap and gravel slopes on each side ~1:1 slope. The facility does not appear to be used for waterfront operations.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Isolated steel piles along shoreline (fish net locations). Timber lagging on the face of the pile-supported building structure prevents access to the shoreline under the building.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Northwest Shoreline	38-4263	SE	Overall view of the remediated shoreline to the northwest of the Boeing building.						
Northwest Shoreline	38-4267	N	View of the shoreline near Fish Net 70 where the shoreline transitions from small rocks to riprap protection.						
Pile-Supported Building	38-4273	N	View of the northwest end of the Boeing building and parking lot. The timber lagging across the face of the apron obstructs the view of the timber piles and shoreline.						
Pile-Supported Building	38-4276	SE	Underdeck view of the pile supported building.						
Outfall	38-4282	N	View of the outfall to the northwest of the building.						
Pile-Supported Building	38-4286	NW	View looking along the face of the pile-supported building.						
Pile-Supported Building	38-4287	SE	View looking along the face of the pile-supported building.						
Pile-Supported Building	38-4290	NE	View of the southeast end of the Boeing building and parking lot.						
Outfall	38-4291	N	View of the outfall to the southeast of the building.						
Outfall and Steel Sheet Pile Wall	38-4293	NE	View of the small outfall extending from a steel sheet pile wall under the bridge south of the Boeing building.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 38

LDW Field Survey Photographs



38-4263



38-4267



38-4273



38-4276



38-4282



38-4286



38-4287



38-4290



38-4291



38-4293

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: South Park Marina

Parcel #: 2185600070, 2185600025, 1600001

River Mile: 3.4 Side: West

Facility Owner: South Park Marina Ltd Part

Business Phone #: Unknown

Structure Type(s)/Use(s): Marina. Moorage of commercial and recreational vessels.

Facility Operator: South Park Marina

Name of Contact: _____

Business Phone #: 206-681-9844

Assessment Date/Time: 2/1/2018 10:00 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Marina with timber floating docks and timber guide piles. The shoreline is an ecology block bulkhead. 4 pile stubs along shoreline and boat launch to the north. 18" outfall north of boat ramp. A debris deflector is located to the south with 4 12" diameter piles. A steel sheet pile wall is along the south shoreline for the Port of Seattle T117 site. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

General access restrictions for an operational marina.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 2/1/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Shoreline	39-5364	W	View of the ecology block bulkhead and four timber piles along the north shoreline.						
Boat Ramp	39-5366	W	View of the boat ramp north of the marina.						
Shoreline	39-5368	S	View of the settling ecology block bulkhead.						
Marina	39-5373	S	General view of the north end of the marina.						
Shoreline	39-5380	NW	View of the settling ecology block bulkhead.						
Shoreline	39-5376	SW	View of the riprap-protected shoreline south of the marina.						
Debris Deflector	39-5382	SE	View of the debris deflector to the south of the marina.						
Sheet Pile Wall	39-5383	S	View of the steel sheet pile wall along the Port of Seattle's T117 site south of the marina.						
Sheet Pile Wall	39-5393	N	View of the steel sheet pile wall along the Port of Seattle's T117 site south of the marina.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 39

LDW Field Survey Photographs



39-5364



39-5366



39-5368



39-5373



39-5376



39-5380



39-5382



39-5383



39-5393

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: McElroy George and Assoc. Inc. Parcel #: 1600060

Facility Owner: National Industrial Holding
River Mile: 4.0 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete pile, concrete- Facility Operator: Sea King Industrial Park LLC
decked finger pier. Vessel moorage. Name of Contact: _____

Business Phone #: 206-777-1543

Assessment Date/Time: 2/1/2018 10:30 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Concrete finger pier with 18-inch-octagonal piles spaced at 7' and 10' bents. Concrete superstructure; vegetated shoreline without protection to north; lots of barges tied up, no access to pier; timber fender piles at 5' spacing; steel sheet pile wall bulkhead; 18" outfall to the north; unprotected shoreline to south; gangway with 30' x 20' float at end; 7-pile timber dolphin ~30' south of finger pier. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

General access restrictions for the finger pier with multiple moored barges.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 2/1/2018
----------------------------------	-----------------------

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments
North Shoreline	40-5406	S	Heavily vegetated north shoreline. The finger pier is in the background.
North Shoreline	40-5408	W	A small inlet is located to the north of the structure.
Finger Pier	40-5410	S	View of the north face of the concrete finger pier.
Concrete Float	40-5419	N	View of the concrete float to the south of the finger pier.
Finger Pier	40-5420	N	View of the south face of the concrete finger pier.
South Shoreline	40-5426	W	View of the south shoreline. The shoreline is unprotected and heavily vegetated in the vicinity of the structure. South of the structure, the shoreline is riprap protected.

Photos Required:

- | | |
|--|---|
| <input type="checkbox"/> All Structure Faces (N, S, E, W) | <input type="checkbox"/> Upstream/Downstream Views of Channel |
| <input type="checkbox"/> Significant Defects/Deterioration | <input type="checkbox"/> Typical Shoreline Conditions |
| <input type="checkbox"/> Timber Debris (if visible) | <input type="checkbox"/> Access Limitations |

STRUCTURE 40

LDW Field Survey Photographs



40-5406



40-5408



40-5410



40-5419



40-5420



40-5426

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Northwest Container Services

Parcel #: 5422600010

River Mile: 4.1 Side: East

Facility Owner: Container Properties, LLC

Business Phone #: Unknown

Structure Type(s)/Use(s): Dolphins for mooring.

Facility Operator: Container Properties

Moorage of barges.

Name of Contact: _____

Business Phone #: 206-849-9185

Assessment Date/Time: 1/23/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility

Assessment Personnel: SS

Study (Y/N): Y

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Dolphin berth with 7 berthing dolphins (9-timber-pile clusters), with a derelict access L-shaped pier (11 two-pile bents extending from shore, then two rows of ~12 piles per row [~20 piles total] extending upstream from access pier). The pile tops are cutoff just above the water line with no decking (some decking remains, but not in all spans). Timber debris sticking out of water between several access pier bents. 2 additional dolphins behind berthing line (one upstream and one downstream of the access pier, both have 3 timber piles). Shoreline is riprap and concrete rubble slope with heavy vegetation, slope undetermined due to water level. The barge berth is operational, but there is no access from shore.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The derelict access pier has tight pile spaces but the majority does not have decking.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Shoreline	41-4345	E	View of the heavily vegetated shoreline.						
Dolphin	41-4347	SE	View of the north timber dolphin. The pile stubs remaining from the derelict access pier are visible in the background.						
Barge Berth	41-4348	S	View of the barge at berth and the timber pile stubs.						
Pile Stubs	41-4357	NE	View of the pile stubs remaining from the access pier.						
Pile Stubs	41-4358	S	View of the pile stubs remaining from the old pierhead.						
Barge Berth	41-4362	N	View of the timber dolphins creating the barge berth and old pier pile stubs.						
South Shoreline	41-4363	NE	View of the heavily vegetated shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 41

LDW Field Survey Photographs



41-4345



41-4347



41-4348



41-4357



41-4358



41-4362



41-4363

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Duwamish Yacht Club

Parcel #: 1600061

River Mile: 4.1 Side: West

Facility Owner: Mellon Trust Of Wa-Desimone

Business Phone #: Unknown

Structure Type(s)/Use(s): Marina. Moorage of recreational vessels.

Facility Operator: Duwamish Yacht Club

Name of Contact: _____

Business Phone #: 206-767-9330

Assessment Date/Time: 1/23/2018 2:30 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: SS

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Marina with covered moorage, timber guide piles, and concrete floats. Large outfall on the west end of the inlet at the upstream end of the marina. The marina has 4 separate docks accessed from 4 gangways. A timber travelift pier is located along the shoreline between the two southern docks. Shoreline behind marina is armored with riprap, slope appears to be ~1:1. Concrete blocks and some steel HP soldier piles with concrete panel lagging at the top of the slope on the north end. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The extent of the marina is close to the shoreline on three sides which will restrict access of large equipment. The covered moorage will limit access below the floats.

Prepared By:



moffatt & nichol

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Seattle, WA 98101

M&N JN: 9573

TEAM LEADER INITIALS: **BJH**

DATE: **1/23/2018**

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
South Shoreline and Marina	42-4483	W	View of the HP soldier pile bulkhead and steel sheet pile wall along the south shoreline and the south side of the covered moorage. The large outfall is visible in the photograph center along the west shoreline.						
Outfall	42-4484	W	View of the large outfall along the west shoreline.						
Marina	42-4486	NE	View of the marina.						
Shoreline and Marina	42-4489	N	HP soldier piles and missing concrete panel lagging is present along the west shoreline.						
Overall	42-4493	NW	Overall view of the marina.						
North Shoreline and Marina	42-4497	W	The north shoreline is riprap protected and vegetated at the top of bank.						
Shoreline and Gangway	42-4501	SW	View of the west shoreline behind the marina.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 42

LDW Field Survey Photographs



42-4483



42-4484



42-4486



42-4489



42-4493



42-4497



42-4501

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Delta Marine Industries Wharf Parcel #: 5624200005

Facility Owner: Delta Marine Industries Inc.
River Mile: 4.2 Side: West Business Phone #: Unknown
Structure Type(s)/Use(s): Concrete finger piers, Facility Operator: Delta Marine Industries Inc.
offshore row of permanently moored floats, Name of Contact: _____
approach from concrete-paneled bulkhead. Business Phone #: 206-763-2383
Mooring vessels for outfitting and repair; Assessment Date/Time: 1/23/2018 2:00 PM
fiberglass vessels manufactured on site. Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Parallel finger piers for a boat lift (2 steel pipe piles per bent, 7 bents per finger) concrete pile cap and concrete deck. Natural shoreline upstream of the upstream finger pier, steel sheet pile bulkhead around finger pier, downstream of finger pier steel HP soldier pile bulkhead with concrete panel lagging. Upstream of the finger piers are 3 steel pipe piles guiding a floating pipe camel/debris deflector. Downstream of finger piers is a floating dock with steel guide piles (access limited due to mega yachts moored at the float. Timber breakwater at the downstream end of the facility (just upstream of the marina). The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

General access restrictions around the floating docks and finger piers.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/23/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
South Shoreline	43-4471	N	View of the vegetated shoreline to the south of the facility. A row of timber pile stubs is present a few hundred feet south of the facility.						
Finger Piers	43-4472	N	View of the south side of the finger piers and the debris deflector to the south.						
Floating Docks	43-4478	N	View of the floating docks.						
Debris Deflector	43-4479	SW	View of the debris deflector to the south of the facility.						
Finger Piers	43-4480	W	View of the finger piers and steel sheet pile bulkhead.						
West Shoreline and Breakwater	43-4481	SW	View of the HP soldier pile bulkhead wall in the background and the timber breakwater south of the marina (right side of photograph).						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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STRUCTURE 43

LDW Field Survey Photographs



43-4471



43-4472



43-4478



43-4479



43-4480



43-4481

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: The Boeing Company Seattle Wharf Parcel #: 5624201032

River Mile: 4.3, Slip 6 Side: East Facility Owner: Boeing

Structure Type(s)/Use(s): Six concrete pile, Business Phone #: Unknown
concrete-decked, asphalt-surfaced loading Facility Operator: Boeing Development Center
piers. Mooring barges; previously not used. Name of Contact: _____

Business Phone #: 425-373-8825
Assessment Date/Time: 1/23/2018 11:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

6 concrete loading piers along south shoreline of Slip 6. Concrete deck and caps, octagonal prestressed piles (unknown size & spacing due to high water level). Pier pile cap spacing ~20ft on center. Timber fender piles along front face of piers. Between piers is a narrow pile supported apron structure with concrete deck, caps, and octagonal prestressed piles (unknown size and spacing due to high water level). Caps spaced at ~10-15ft. North and east shoreline appear to be riprap-protected with vegetation. The shoreline slopes were hard to determine due to high water level. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Low underdeck clearance will restrict access under the platforms.

Prepared By:



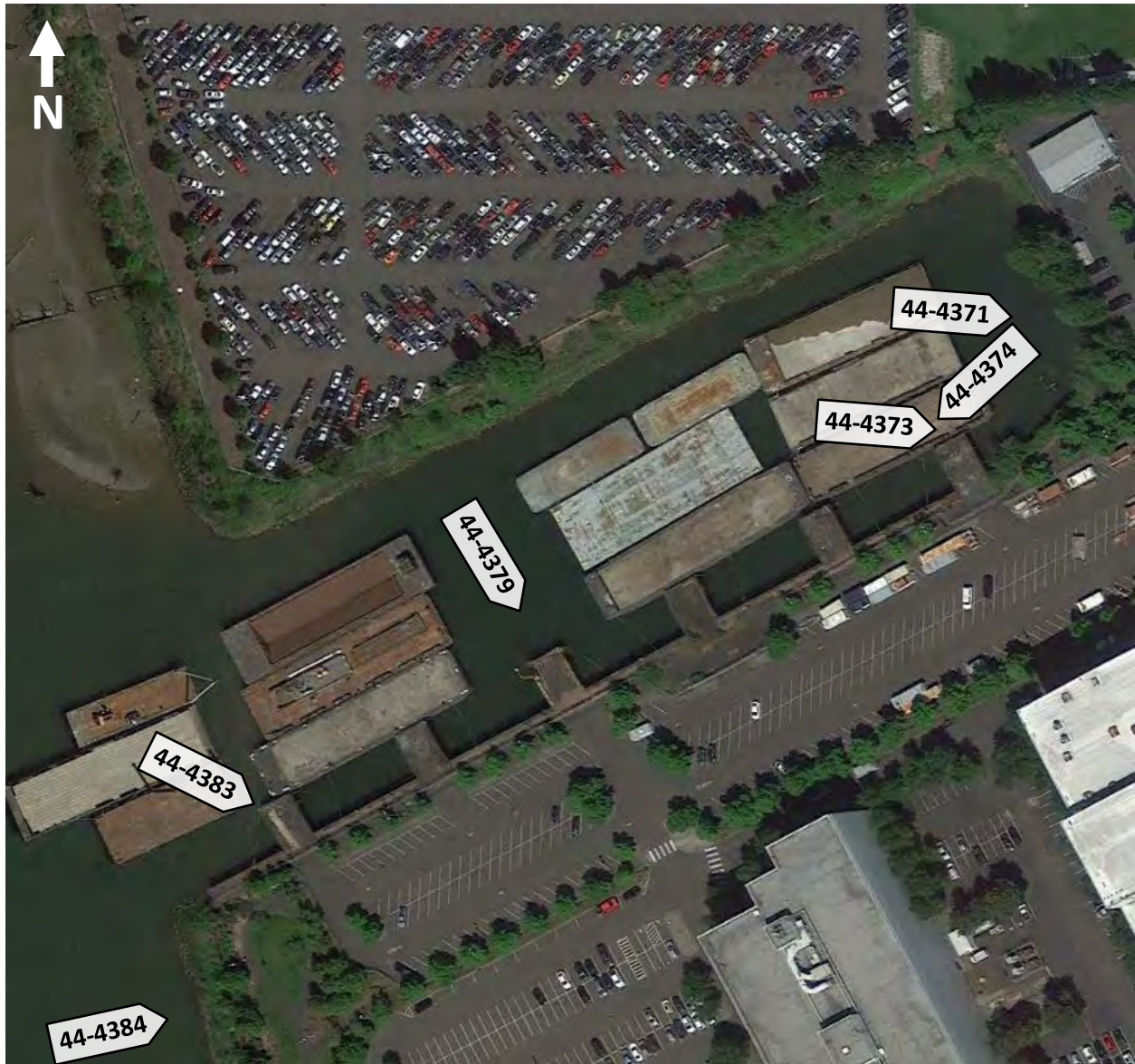
moffatt & nichol

600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/23/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Northeast Shoreline	44-4371	SE	The northeast shoreline is vegetated and protected by small riprap.						
Northeast Pier	44-4373	SE	View of the most northeast loading pier.						
Apron	44-4374	SW	View of the concrete apron between loading piers.						
Loading Pier	44-4379	S	View of the west-central loading pier.						
Southwest Pier	44-4383	SE	View of the most southwest loading pier.						
South Shoreline	44-4384	NE	View of the vegetated shoreline. Small riprap is visible just above the waterline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 44

LDW Field Survey Photographs



44-4371



44-4373



44-4374



44-4379



44-4383



44-4384

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: T-105 Public Access and Pile Field

Parcel #: 7666703460, 7666703532

Facility Owner: Port of Seattle

River Mile: 0.1 Side: West

Business Phone #: Unknown

Structure Type(s)/Use(s): Span single-span pier and large pile fields associated with historical vessel launch facilities. Park/public access.

Facility Operator: Terminal 105

Name of Contact:

Business Phone #: 206-787-3675

Assessment Date/Time: 1/24/2018 10:30 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Single-span steel pier used for public access. The span is supported by steel piles spaced at approx. 20 feet and a steel pile cap. The shoreline is protected by riprap. South of the steel pier is a large pile field. Previous reports indicate there are 500+ timber piles; however, due to high water levels, only approx. 40 piles were visible in the waterway and 50 piles were visible along a concrete bulkhead. An inlet to the waterway is present between the steel pier and the pile field. Just south of the inlet, the shoreline appears to be remediated and is protected with logs. The single-span pier is operational as public access.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The submerged pile field may restrict access.

Prepared By:



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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/24/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Steel Pier	45-4554	S	View of the north side of the single-span steel pier.						
North Shoreline	45-4564	NW	View of the riprap-protected shoreline to the north of the steel pier.						
Shoreline	45-4574	W	View of the riprap-protected shoreline south of the steel pier.						
Pile Field	45-4581	SW	View of a portion of the visible pile stubs in the 500+ pile field.						
Shoreline	45-4586	W	View of the shoreline protected with logs.						
Pile Field and Bulkhead	45-4595	S	View of the concrete bulkhead and visible piles of the 500+ pile field.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 45

LDW Field Survey Photographs



45-4554



45-4564



45-4574



45-4581



45-4586



45-4595

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Submerged sewer line crossing.

Parcel #: N/A

Facility Owner: Unknown

River Mile: 0.43 to 0.48 Side: Both

Business Phone #: Unknown

Structure Type(s)/Use(s): Submerged sewer line crossing.

Facility Operator: Unknown

Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: 1/24/2018 10:00 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Submerged sewer line. Approximate location found by locating on-land signs. It is unknown if the sewer line is operational. The shoreline along the east side of the waterway is protected with riprap. The shoreline along the west side of the waterway is behind a wharf and is a timber bulkhead.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The sewer line should be located so proper planning can be made around the pipe.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
East Shoreline	46-3196	E	View of the east shoreline where the on-land sign is located.						
West Shoreline	46-4622	W	View of the west shoreline where the on-land sign is located on a timber wharf (Structure #6).						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 46

LDW Field Survey Photographs



46-3196



46-4622

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Overhead power cable crossing. Parcel #: N/A

River Mile: 0.38 to 0.47 Side: Both Facility Owner: Unknown

Structure Type(s)/Use(s): Overhead power cable Business Phone #: Unknown
crossing. Facility Operator: Unknown

Name of Contact: _____
Business Phone #: Unknown

Assessment Date/Time: 1/24/2018 10:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: HL
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Overhead powerlines. Authorized vertical clearances are in excess of 90 ft. It is assumed the power lines are operational. The shoreline along the east side of the waterway is protected with riprap. The shoreline along the west side of the waterway is behind a wharf and is a timber bulkhead.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

None

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
East Shoreline	47-4660	E	View of the east shoreline.						
East Shoreline	47-4669	E	View of the east shoreline.						
West Shoreline	47-4670	W	The west shoreline is obstructed by a barge.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 47

LDW Field Survey Photographs



47-4660



47-4669



47-4670

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Overhead Power Cable 2

Parcel #: N/A

River Mile: 1.95 Side: Both

Facility Owner: Unknown

Structure Type(s)/Use(s): Overhead power cable crossings. Authorized vertical clearances are in excess of 90 ft at each installation.

Business Phone #: Unknown

Facility Operator: Unknown

Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: 1/25/2018 11:00 AM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Overhead power lines appear operational. The south shoreline is heavily vegetated.

East side is obstructed by boat houses.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

None.

Prepared By:



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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



STRUCTURE 48

LDW Field Survey Photographs



48-4968

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Overhead Power Cable 3

Parcel #: N/A

River Mile: 3.6 Side: Both

Facility Owner: Unknown

Structure Type(s)/Use(s): Overhead power cable crossings. Authorized vertical clearances are in excess of 90 ft at each installation.

Business Phone #: Unknown

Facility Operator: Unknown

Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: N/A

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): Y

Assessment Personnel: N/A

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Structure not found. There are no overhead cables in this area.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Unknown.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 2/1/2018

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Overhead power cable crossing Parcel #: Unknown

River Mile: 4.4 Side: Both Facility Owner: Unknown

Structure Type(s)/Use(s): Overhead power cable Business Phone #: Unknown
crossings. Authorized vertical clearances are in Facility Operator: Unknown
excess of 90 ft. Name of Contact: _____

Business Phone #: Unknown
Assessment Date/Time: 1/23/2018 11:30 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

There are 12 lines overhead with a large tower on each shoreline. The shoreline below the power lines is vegetated riprap. The slope is unknown due to high water levels. It is assumed the powerlines are operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

No in-water restrictions.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/23/2018
----------------------------------	------------------------

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall	50-4394	W	Overall view of the overhead powerlines.						
West Shoreline	50-4395	W	Overall view of the west shoreline.						
East Shoreline	50-4396	E	Overall view of the east shoreline.						
Overall	50-4399	E	Overall view of the overhead powerlines.						
<p>Photos Required:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td style="width: 50%; border: none;"><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Significant Defects/Deterioration</td> <td style="border: none;"><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Timber Debris (if visible)</td> <td style="border: none;"><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 50

LDW Field Survey Photographs



50-4394



50-4395



50-4396



50-4399

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Pile group along Kellogg Island's west side. Parcel #: N/A
River Mile: 0.6 to 0.9 Side: West Facility Owner: Unknown
Structure Type(s)/Use(s): Pile group along Kellogg Island's west side. Oil boom storage. Business Phone #: Unknown
Facility Operator: Unknown
Name of Contact: _____
Business Phone #: Unknown
Assessment Date/Time: 1/24/2018 10:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Study (Y/N): Y Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Various timber piles along the west side of Kellogg Island. The north portion of the island has a flat unprotected shoreline. The south portion of the island has a steep (~1:1) vegetated shoreline. Oil booms are currently attached to some of the piles for storage.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Shallow water.

Prepared By:



600 University Street, Suite 610
Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/24/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Downstream	51-4728	N	View of the three northern timber piles and the downstream waterway.						
Upstream	51-4730	SW	View of the timber piles looking upstream.						
Timber Piles	51-4735	S	View of the timber piles looking upstream. Oil booms are currently attached to the southern piles.						
Timber Piles	51-4736	S	View of the timber piles looking upstream. Oil booms are currently attached to the southern piles. The shoreline is vegetated.						
Timber Piles	51-4738	N	View of the timber piles looking downstream. Oil booms are currently attached to the southern piles.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 51

LDW Field Survey Photographs



51-4728



51-4730



51-4735



51-4736



51-4738

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Pile and dolphin group along Kellogg Island's east side.</u>	Parcel #: <u>N/A</u>
River Mile: <u>0.6 to 0.9</u> Side: <u>West</u>	Facility Owner: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Pile and dolphin group along Kellogg Island's east side.</u>	Business Phone #: <u>Unknown</u>
_____	Facility Operator: <u>Unknown</u>
_____	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
Structure was Identified during 2012 Feasibility Study (Y/N): <u>Y</u>	Assessment Date/Time: <u>1/24/2018 10:00 AM</u>
_____	Team Leader: <u>BH</u>
_____	Assessment Personnel: <u>HL</u>

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Various timber piles and timber dolphins along the east side of Kellogg Island. The north portion of the island has a flat unprotected shoreline. The south portion of the island has a steep (~1:1) vegetated shoreline.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Shallow water.

Prepared By:



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Seattle, WA 98101
M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/24/2018
----------------------------------	------------------------

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Dolphin	52-4674	S	View of a 3-pile timber dolphin along the east side of Kellogg Island.						
Dolphins	52-4681	S	View of timber dolphins along the east side of Kellogg Island.						
Shoreline	52-4686	W	View of the north portion of Kellogg Island. The shoreline is flat and unprotected. A timber pile is present along the shoreline.						
Dolphins	52-4687	S	View of timber dolphins along the east side of Kellogg Island.						
Dolphins	52-4691	N	View of timber dolphins along the east side of Kellogg Island.						
Dolphin and Shoreline	52-4694	S	View of the southern timber dolphin. The south end of Kellogg Island exhibits steep unprotected shorelines. Evidence of erosion is present.						
Dolphins	52-4700	W	View of timber dolphins on the east side of Kellogg Island.						
Dolphins	52-4716	W	Four 3-pile steel dolphins are present on the south side of Kellogg Island.						
Pile Stub and Shoreline	52-4721	NE	Three timber pile stubs were observed on the south side of Kellogg Island. The south shoreline is steep and exhibits evidence of erosion.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 52

LDW Field Survey Photographs



52-4674



52-4681



52-4686



52-4687



52-4691



52-4694



52-4700



52-4716



52-4721

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Submerged Cable & Pipeline Area</u>	Parcel #: <u>N/A</u>
_____	Facility Owner: <u>Unknown</u>
River Mile: <u>1.8 to 2.1</u> Side: <u>Both</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Submerged cable and pipeline area.</u>	Facility Operator: <u>Unknown</u>
_____	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
_____	Assessment Date/Time: <u>1/25/2018 11:00 AM</u>
Structure was Identified during 2012 Feasibility Study (Y/N): <u>Y</u>	Team Leader: <u>BH</u>
_____	Assessment Personnel: <u>AP</u>
_____	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Nothing visible to note. Signs found on the shoreline indicating a submerged pipeline just west of the 1st Ave Bridge. Operational status is unknown.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

General considerations for the submerged pipeline.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
South Shoreline	53-4971	S	View of the south shoreline where a sign is located indicating a submerged pipeline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 53

LDW Field Survey Photographs



53-4971

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: 1st Ave Bascule Bridges Parcel #: N/A

Facility Owner: Unknown
River Mile: 2.1 to 2.2 Side: Both Business Phone #: Unknown
Structure Type(s)/Use(s): First Avenue bascule Facility Operator: Unknown
bridges. The west and east bridges have 145-ft Name of Contact: _____
horizontal clearance closed and 120-ft horizontal Business Phone #: Unknown
clearance open. Vertical clearance is 22 ft (39 ft Assessment Date/Time: 1/25/2018 1:30 PM
at center) when closed. Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Bascule bridge with concrete fender wingwalls on the sides of the navigation channel. The north and south shorelines are riprap protected. The south shoreline has a small bridge that crosses a small inlet. A boat ramp is located just east of the bridge on the north shoreline. The bridges are operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Concrete walls restrict access to shoreline
Northwest of west fender wall is a pile stub field (timber piles) approx. 50 total

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TEAM LEADER INITIALS: BJH

DATE: 1/25/2018

3. STRUCTURE VICINITY MAP:



4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Fender Wingwalls	54-5000	E	Closeup view of the concrete fender wingwall under the bridges.						
Pile Field	54-5001	S	View of the pile field on the southwest shoreline of the bridge.						
East Bridge	54-5003	NW	General view of the bridge.						
South Shoreline	54-5005	SW	View of the shoreline under the bridge. A small bridge parallels the shoreline and crosses a small inlet.						
Bridge	54-5008	NW	View of the bridge pier and fender wingwall.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 54

LDW Field Survey Photographs



54-5000



54-5001



54-5003



54-5005



54-5008

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Submerged Cable Area 1</u>	Parcel #: <u>N/A</u>
_____	Facility Owner: <u>Unknown</u>
River Mile: <u>2.85 to 3.0</u> Side: <u>Both</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Submerged cable area.</u>	Facility Operator: <u>Unknown</u>
_____	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
_____	Assessment Date/Time: <u>N/A</u>
Structure was Identified during 2012 Feasibility	Team Leader: <u>BH</u>
Study (Y/N): <u>Y</u>	Assessment Personnel: <u>N/A</u>
_____	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Structure not found. There are no signs on the shoreline indicating a submerged pipeline.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Unknown.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 2/1/2018
----------------------------------	-----------------------

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Submerged Cable Area 2 Parcel #: N/A

River Mile: 3.15 to 3.4 Side: Both Facility Owner: Unknown

Structure Type(s)/Use(s): Submerged cable area. Business Phone #: Unknown

Facility Operator: Unknown

Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: N/A

Team Leader: BH

Structure was Identified during 2012 Feasibility Assessment Personnel: N/A
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Structure not found. There are no signs on the shoreline indicating a submerged pipeline.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Unknown.

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TEAM LEADER INITIALS: BJH	DATE: 2/1/2018
----------------------------------	-----------------------

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: South Park Bascule Bridge Parcel #: N/A

Facility Owner: Unknown
River Mile: 3.3 to 3.4 Side: Both Business Phone #: Unknown
Structure Type(s)/Use(s): South Park bascule Facility Operator: Unknown
bridge. Also known as the 14th/16th Ave South Name of Contact: _____
Bridge. Business Phone #: Unknown

Assessment Date/Time: 2/1/2018 9:30 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: N/A
Study (Y/N): Y _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Bascule bridge with wing walls on each side of the navigation channel. 24" dia wing wall piles spaced at 5'. Riprap protected shorelines. The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

General access restrictions in the vicinity of the bridge piers and the wingwalls.

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TEAM LEADER INITIALS: **BJH**

DATE: **2/1/2018**

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 2/1/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
North Bridge	57-5344	W	View of the north portion of the bridge.						
South Bridge	57-5345	SW	View of the south portion of the bridge.						
Wingwall	57-5346	W	View of the wingwalls within the navigation channel.						
North Shoreline	57-5347	NW	View of the riprap protected north shoreline. A small outfall extends from a sheet pile wall below the bridge.						
South Shoreline	57-5349	SW	View of the south shoreline under the bridge.						
Overall	57-5363	W	Overall view of the bridge.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 57

LDW Field Survey Photographs



57-5344



57-5345



57-5346



57-5347



57-5349



57-5363

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Abandoned and working piles and dolphins. Parcel #: N/A
River Mile: N/A Side: Both Facility Owner: Unknown
Structure Type(s)/Use(s): Pile group along Kellogg Island's west side. Oil boom storage. Business Phone #: Unknown
Facility Operator: Unknown
Name of Contact: _____
Business Phone #: Unknown
Assessment Date/Time: N/A
Team Leader: BH
Structure was Identified during 2012 Feasibility Study (Y/N): Y Assessment Personnel: HL

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

The various abandoned and working piles and dolphins are documented either with an associated structure or with the shoreline observations. This form is a placeholder for Structure #58 which was previously listed in Table 2-10 of the Feasibility Study.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

N/A

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TEAM LEADER INITIALS: BJH

DATE: 2/1/2018

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: T108 Berth Parcel #: 7666700510

Facility Owner: Port of Seattle
River Mile: 0.5 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Vessel berth with Facility Operator: Unknown
marginal walkway and access walkways. Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: 1/10/18 11:00 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: AP
Study (Y/N): N _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber dolphin barge berth, timber pile supported marginal walkway between dolphins, and steel pile supported piping. Four timber pile cluster dolphins create the breasting line and two timber pile cluster dolphins are located at the walkway corners for mooring lines. The 4ft wide timber walkways are supported by single timber piles at approx. 20ft spacing. The catwalks do not extend to shore. The shoreline is riprap protected and vegetated.

The steel pile supported pipe trestle extends from shore to the wharf. Pile spacing is approximately 50ft. The facility appears operational for mooring of vessels. Unknown if facility is operational for other uses.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The timber walkways prevent vessel access to shoreline. Portions of the walkways appear unstable.

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moffatt & nichol

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TEAM LEADER INITIALS: **BJH**

DATE: **1/10/2018**

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall	59-3198	SE	Overall view of the facility and barge at berth.						
North Shoreline	59-3199	E	View of the riprap protected and vegetated north shoreline.						
North Mooring Dolphin and Walkway	59-3203	S	View of the north timber mooring dolphin and timber pile supported walkway. The pile supported pipe trestle is visible in the background.						
South Mooring Dolphin and Walkway	59-3207	N	View of the south timber mooring dolphin and timber pile supported walkway. The walkway is leaning towards shore on the south leg. The pile supported pipe trestle is visible in the background.						
Walkway and South Shoreline	59-3210	E	The timber walkway does not extend to the shoreline. At the south end of the facility, the riprap protected shoreline transitions to a vegetated shoreline protected by logs.						
South Shoreline	59-3214	E	The shoreline south of the facility is vegetated and is protected by logs.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 59

LDW Field Survey Photographs



59-3198



59-3199



59-3203



59-3207



59-3210



59-3214

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Timber Pile Field</u>	Parcel #: <u>3573201061</u>
_____	Facility Owner: <u>5055 Properties, LLC</u>
River Mile: <u>1.0</u> Side: <u>East</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Timber pile field. No</u>	Facility Operator: <u>Unknown</u>
<u>known use.</u>	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
_____	Assessment Date/Time: <u>1/10/2018 12:30 PM</u>
_____	Team Leader: <u>BH</u>
Structure was Identified during 2012 Feasibility	Assessment Personnel: <u>AP</u>
Study (Y/N): <u>N</u>	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Field of timber pile stubs (approx. 100 piles) along shoreline, south of structure #8 and north of structure #7 (Manson). Pile stubs are approx. 5ft x 5ft spacing along shoreline. A portion of the pile field still has timber pile caps and timber decking. Not operational as a facility. Shoreline is vegetated.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Pile stubs restrict access to shoreline.

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TEAM LEADER INITIALS: BJH

DATE: 1/10/2018

STRUCTURE VICINITY MAP:



STRUCTURE 60

LDW Field Survey Photographs



60-3247



60-3250



60-3255

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Box Culvert and Pile Field Parcel #: 1924049051
_____ Facility Owner: King County
_____ Business Phone #: Unknown
River Mile: 1.1 Side: East Facility Operator: Unknown
Structure Type(s)/Use(s): Pile group, two timber
mooring dolphins, and box culvert. Name of Contact: _____
_____ Business Phone #: Unknown
_____ Assessment Date/Time: 1/10/2018 2:15 PM
Structure was Identified during 2012 Feasibility Team Leader: BH
Study (Y/N): N Assessment Personnel: AP

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Pile group south of Structure #7 (Lehigh Cement). Concrete box culvert outfall at north end of facility, approximately 4ft wide. Two timber mooring dolphins towards south end of area. Concrete rubble along shoreline. Not operational as a facility.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

Pile stubs restrict access to shoreline.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/10/2018
----------------------------------	------------------------

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Overall	61-3293	SE	Overall view of the facility.						
Box Culvert	61-3294	E	View of the box culvert and small upland building. Numerous timber pile stubs are in the area.						
Timber Dolphins	61-3295	E	View of the two 5-pile timber pile dolphins. Numerous timber pile stubs are in the area.						
Shoreline	61-3296	E	View of the concrete-rubble protected shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 61

LDW Field Survey Photographs



61-3293



61-3294



61-3295



61-3296

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Mooring/Berthing Dolphins Parcel #: 0001800113, 0001800091

River Mile: 2.3 Side: East Facility Owner: Unknown

Structure Type(s)/Use(s): Timber and steel Business Phone #: Unknown
mooring and berthing dolphins. Barge berths. Facility Operator: Unknown

Name of Contact: _____
Business Phone #: Unknown
Assessment Date/Time: 1/18/2018 9:30 AM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): N _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Multiple barge dolphin berths in approx.. a N-S orientation. 5 timber pile dolphins (timber pile clusters with approximately 14 piles typical, southernmost of the timber pile dolphins has approximately 10 piles) located on the north end of the berthing line, followed by 5 steel pipe (~36" diameter) monopile dolphins on the south end of the berthing line. The southernmost dolphin is two pipe piles connected at the top. Berthing line doglegs to a ~E-W orientation at the south end with 8 steel pipe (~36" and ~24" diameter) monopile dolphins. Steep riprap-protected slope (mostly concrete rubble and brick). The facility is operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

No apparent in water obstructions. The south side of cove to the east of the barge berths has miscellaneous derelict timber pile pier/piles/old dolphins.

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TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Dolphins and Shoreline	62-4140	N	View of the timber dolphins and concrete-rubble protected shoreline.						
Shoreline	62-4141	NE	View of the concrete-rubble protected shoreline.						
Dolphins	62-4142	NW	View of the timber dolphins.						
Dolphins	62-4143	S	View of the steel mono pile dolphins.						
Dolphins	62-4147	E	View of the steel mono pile dolphins.						
Dolphins	62-4153	W	View of the steel mono pile dolphins.						
East Shoreline	62-4155	N	View of the vegetated and concrete-rubble protected shoreline.						
Pile Field	62-4163	E	View of the miscellaneous timber piles, dolphins and dock to the southeast of the barge berths.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 62

LDW Field Survey Photographs



62-4140



62-4141



62-4142



62-4143



62-4147



62-4153



62-4155



62-4163

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Miscellaneous Waterfront Structure Parcel #: 2136200670

Facility Owner: Unknown
River Mile: 2.7 Side: East Business Phone #: Unknown
Structure Type(s)/Use(s): Waterfront building Facility Operator: Unknown
with timber pile wingwalls. The use is unknown. Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: 1/18/2018 12:00 PM
Team Leader: BH
Structure was Identified during 2012 Feasibility Assessment Personnel: SS
Study (Y/N): N _____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

A derelict transfer span on a timber soldier pile wall with concrete lagging is present at the north (downstream) end. The shoreline transitions into a concrete rubble armored slope then into a timber bulkhead wall with timber fendering system in a small cove. At E end of the cove is a small upland building. The timber bulkhead south of building transitions to concrete rubble protected shoreline ~1V:2H. The operational status and function of the facility is unknown.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The timber wingwalls will limit access to the north and south of the building.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Derelict Transfer Span	63-4213	E	View of the derelict transfer span, timber abutment, and concrete bulkhead along the north shoreline of the facility.						
Overall	63-4215	SE	Overall view of the timber wingwalls and waterfront building.						
Waterfront Building	63-4216	SE	View of the waterfront building.						
Timber Wingwall	63-4219	SE	Closeup view of the north timber wingwall.						
Overall	63-4222	N	Overall view of the timber wingwalls and waterfront building.						
South Shoreline	63-4223	NE	View of the concrete rubble protected shoreline and timber wingwall. There is a sandy ramp between the shoreline and wingwall with a number of timber pile stubs.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel								
<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 63

LDW Field Survey Photographs



63-4213



63-4215



63-4216



63-4219



63-4222



63-4223

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Timber Bulkhead</u>	Parcel #: <u>2924049043</u>
_____	Facility Owner: <u>First South Properties, LLC</u>
River Mile: <u>2.85</u> Side: <u>East</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Timber bulkhead. The use is unknown.</u>	Facility Operator: <u>Unknown</u>
_____	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
_____	Assessment Date/Time: <u>1/18/2018 2:45 PM</u>
Structure was Identified during 2012 Feasibility Study (Y/N): _____	Team Leader: <u>BH</u>
_____	Assessment Personnel: <u>SS</u>
_____	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Timber pile soldier pile bulkhead on SE side of Slip 4. Ecology block wall behind and above timber bulkhead. Armored rock slope on either side of bulkhead. 1V:2H. Shallow water depth in front of the bulkhead with very gradual slope. Shoreline W of the bulkhead is a small riprap. The facility is functional as a bulkhead, but not operational for waterfront operations.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

No access restrictions.

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M&N JN: 9573

TEAM LEADER INITIALS: BJH

DATE: 1/18/2018

3. STRUCTURE VICINITY MAP:



STRUCTURE 64

LDW Field Survey Photographs



64-4257



64-4258



64-4259

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: Miscellaneous steel and timber bulkheads

Parcel #: 1600020, 1600023, 160014, 7400033, 5422600060

Facility Owner: Boeing, Star Forge, LLC, Centerpoint Properties

River Mile: 3.5 – 4.0 Side: East

Business Phone #: Unknown

Structure Type(s)/Use(s): Steel and timber bulkheads.

Facility Operator: Unknown

Name of Contact: _____

Business Phone #: Unknown

Assessment Date/Time: 1/18/2018 4:00 PM

Team Leader: BH

Structure was Identified during 2012 Feasibility Study (Y/N): N

Assessment Personnel: SS

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Starting at the upstream boundary of the Boeing facility (structure #38) small riprap and gravel shoreline protection ~1:1 slope. Steel sheet pile bulkhead upriver of the riprap slope. The steel sheet pile bulkhead stops at fish net 54 and changes upstream to a HP soldier pile wall with concrete panels as lagging. Between fishnet 51 and 49 the wall changes to a HP soldier pile wall with timber lagging. Around upstream corner at RM 3.8, the bulkhead switches to steel sheet pile with timber fender piles and waler. Upstream of fish net 47 the shoreline is near vertical clay bank with heavy vegetation. About 100ft upstream of fishnet 45, the steel sheet pile bulkhead starts, continues to where structure 41 starts. The upstream end of the sheet pile wall has 3 dolphins (2 downstream are single timber piles with fishnet locations, upstream dolphin is a 3-pile timber dolphin). Upstream of fishnet 41, the wall transitions to a riprap slope with heavy vegetation. The slope angle could not be determined due to water level. The bulkheads are functional and don't appear to be used for waterfront operations.

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 M&N JN: 9573

TEAM LEADER INITIALS: BJH	DATE: 1/18/2018
----------------------------------	------------------------

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

There are no in-water obstructions or access restrictions other than the noted bulkheads and dolphins.

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/18/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Steel Sheet Pile Bulkhead	65-4308	E	View of the small steel sheet pile wall along the riprap-protected shoreline.						
Steel Sheet Pile Bulkhead	65-4314	SE	View of the north end of the long steel sheet pile bulkhead.						
Bulkheads	65-4317	SE	View of the transition from the steel sheet pile bulkhead to the HP soldier pile wall with concrete panels.						
HP Soldier Pile Wall with Concrete Panels	65-4318	E	View of the HP soldier pile wall with concrete panels.						
HP Soldier Pile Wall with Timber Lagging	65-4319	E	View of the HP soldier pile wall with timber lagging.						
HP Soldier Pile Wall with Concrete Panels	65-4323	E	View of the HP soldier pile wall with concrete panels.						
Steel Sheet Pile Bulkhead	65-4328	SE	View of the steel sheet pile wall with timber fender piles.						
Steel Sheet Pile Bulkhead and South Shoreline	65-4331	SE	View of the south end of the steel sheet pile wall and the steep unprotected shoreline to the south.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 65

LDW Field Survey Photographs



65-4308



65-4314



65-4317



65-4318



65-4319



65-4323



65-4328



65-4331

IN-WATER STRUCTURES ASSESSMENT FORM

1. GENERAL FACILITY INFORMATION:

Structure: <u>Timber wharf and timber pile groins.</u>	Parcel #: <u>0003400018</u>
_____	Facility Owner: <u>Boeing</u>
River Mile: <u>4.7</u> Side: <u>East</u>	Business Phone #: <u>Unknown</u>
Structure Type(s)/Use(s): <u>Timber wharf and</u>	Facility Operator: <u>Unknown</u>
<u>timber pile groins.</u>	Name of Contact: _____
_____	Business Phone #: <u>Unknown</u>
_____	Assessment Date/Time: <u>1/23/2018 12:00 PM</u>
_____	Team Leader: <u>BH</u>
Structure was Identified during 2012 Feasibility	Assessment Personnel: <u>SS</u>
Study (Y/N): <u>N</u>	_____

2. STRUCTURE DESCRIPTION AND ACCESS RESTRICTIONS:

Description (e.g., length/size, construction type and materials, general physical condition, operational status, shoreline conditions, approximate shoreline slope, outfalls):

Two timber pile supported concrete wharfs along shoreline (small platform downstream, larger platform upstream). Piles at approx. 10'x10' spacing with heavy cross bracing. Timber soldier pile bulkhead behind platform. Derelict timber groins extending from shore at a downstream angle (timber piles tangent to each other making up groin wall, mostly submerged due to high water level). Shoreline protected by small rip rap, slope unknown. Bridge at MP 4.8 just upstream of the platforms and groins. The facility appears operational.

Access Restrictions (e.g., under pier areas/clearance, extent of riprap vs. soft sediment, and vicinity of dolphins/piling, bulkheads, and riprapped or engineered shorelines which may require adjustments to sampling, cleanup technology or remedial design):

The tight pile spacing and cross bracing will restrict access under the wharves. The timber-groin piles form solid walls.

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TEAM LEADER INITIALS: BJH

DATE: 1/23/2018

3. STRUCTURE VICINITY MAP:



Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/23/2018

4. PHOTO LOG

Element	Photo No.	Direction	Description / Comments						
Small Platform and Shoreline	66-4420	N	Small concrete platform supported by timber piles. The shoreline is protected by small riprap and is vegetated.						
Timber Groins and Downstream	66-4421	W	The timber groin is mostly submerged.						
Large Platform and Timber Groins	66-4422	E	Large concrete platform supported by timber piles. The timber groins are mostly submerged.						
Timber Groins and Upstream	66-4424	E	The timber groins are mostly submerged.						
Large Platform	66-4430	NW	Large concrete platform supported by timber piles with extensive cross bracing.						
Timber Groin	66-4437	NE	Timber groin extending from the shoreline.						
<p>Photos Required:</p> <table border="0"> <tr> <td><input type="checkbox"/> All Structure Faces (N, S, E, W)</td> <td><input type="checkbox"/> Upstream/Downstream Views of Channel</td> </tr> <tr> <td><input type="checkbox"/> Significant Defects/Deterioration</td> <td><input type="checkbox"/> Typical Shoreline Conditions</td> </tr> <tr> <td><input type="checkbox"/> Timber Debris (if visible)</td> <td><input type="checkbox"/> Access Limitations</td> </tr> </table>				<input type="checkbox"/> All Structure Faces (N, S, E, W)	<input type="checkbox"/> Upstream/Downstream Views of Channel	<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions	<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations
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<input type="checkbox"/> Significant Defects/Deterioration	<input type="checkbox"/> Typical Shoreline Conditions								
<input type="checkbox"/> Timber Debris (if visible)	<input type="checkbox"/> Access Limitations								

STRUCTURE 66

LDW Field Survey Photographs



66-4420



66-4421



66-4422



66-4424



66-4430



66-4437

APPENDIX B-2

MISCELLANEOUS SHORELINE,
LDW FIELD SURVEY
PHOTOGRAPHS

MISCELLANEOUS SHORELINE

LDW Field Survey Photographs

1. SHORELINE PHOTO LOG

Element	Photo No.	Direction	Description / Comments
East Shoreline	3181	SE	Riprap-protected shoreline south of Structure #4 near RM 0.25
East Shoreline	3193	E	Riprap-protected shoreline near RM 0.3
East Shoreline	3195	E	Riprap-protected shoreline near RM 0.4
East Shoreline	3215	E	Unprotected shoreline in the inlet near RM 0.65
East Shoreline	3218	E	Riprap-protected shoreline near RM 0.7
East Shoreline	3317	SE	Riprap-protected shoreline south of Structure #12 near RM 1.25
East Shoreline	3318	SE	Sloughing of the top of bank near RM 1.3
East Shoreline and Dolphin	3322	E	Concrete-rubble protected shoreline and a 7-pile timber dolphin near RM 1.35
East Shoreline and Dolphin	3323	E	Concrete-rubble and riprap protected shoreline and a 7-pile timber dolphin near RM 1.4
East Shoreline	3336	SE	Riprap-protected shoreline between Structures #15 and #18 near RM 1.55
East Shoreline	3363	NE	Riprap-protected shoreline near RM 1.7 with a steel sheet pile wall and concrete bulkhead at the top of bank
East Shoreline (Slip 2)	3377	E	Riprap-protected shoreline within Slip 2 near RM 1.7
East Shoreline (Slip 2)	3387	SE	Steep bank to the east of Structure #23 with bricks and concrete rubble used as protection (RM 1.75)
East Shoreline	3971	SE	Concrete-rubble shoreline protection under the 1 st Ave Bridge (RM 2.0)
East Shoreline (Ditch)	3973	E	A small ditch in the vicinity of the 1 st Ave Bridge (RM 2.0)
East Shoreline (Slip 3)	4066	S	Vegetated shoreline between Structures #26 and #27 near RM 2.15
East Shoreline and Dolphin	4206	SE	Shoreline protected with poured concrete south of Structure #32 near RM 2.6. A 2-pile timber dolphin is in the waterway and a timber pile stub is along the shoreline in the background.

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TEAM LEADER INITIALS: BJH

DATE: 2/1/2018

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018 – 2/1/2018

Element	Photo No.	Direction	Description / Comments
East Shoreline	4209	E	Concrete-rubble protected shoreline near RM 2.65
East Shoreline	4211	E	Concrete-rubble protected shoreline near RM 2.7. Moderate erosion is present.
East Shoreline (Slip 4)	4245	SE	Small riprap protection along the shoreline within Slip 4.
East Shoreline (Slip 4)	4260	S	Riprap protection along the shoreline within Slip 4 near RM 2.85
East Shoreline	4265	SE	Remediated shoreline between RM 2.85 and 3.0
East Shoreline	4267	E	Remediated shoreline between RM 2.85 and 3.0. Fish net posts are installed along the shoreline.
East Shoreline	4269	SE	Riprap-protected shoreline near RM 3.0
East Shoreline	4294	SE	Remediated shoreline between RM 3.3 and 3.6. Fish net posts are installed along the shoreline.
East Shoreline	4297	E	Remediated shoreline between RM 3.3 and 3.6. Fish net posts are installed along the shoreline.
East Shoreline	4304	SE	Remediated shoreline between RM 3.3 and 3.6. Fish net posts are installed along the shoreline.
East Shoreline	4306	SE	Riprap-protected shoreline between RM 3.6 and 3.7
East Shoreline	4313	SE	Riprap-protected shoreline between RM 3.6 and 3.7
East Shoreline	4332	SE	Heavily vegetated shoreline between RM 4.0 and 4.2
East Shoreline	4340	SE	Heavily vegetated shoreline between RM 4.0 and 4.2
East Shoreline (Slip 6)	4369	NW	Heavily vegetated shoreline near RM 4.2 within Slip 6
East Shoreline (Slip 6)	4371	SE	Heavily vegetated shoreline near RM 4.2 within Slip 6
East Shoreline	4386	SE	Riprap-protected and vegetated shoreline near RM 4.3
East Shoreline	4388	E	Riprap-protected and vegetated shoreline near RM 4.35
East Shoreline and Dolphin	4392	SE	Heavily vegetated and riprap-protected shoreline near RM 4.4. A 14-pile timber dolphin is present in the water.
Outfall	4401	E	Outfall on the riprap-protected shoreline near RM 4.5

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018 – 2/1/2018

Element	Photo No.	Direction	Description / Comments
East Shoreline	4409	E	Heavily vegetated and riprap-protected shoreline near RM 4.6
East Shoreline	4438	SE	South of RM 4.8, the shoreline is heavily vegetated. Timber pile groins extend from the shoreline.
West Shoreline	4441	W	Heavily vegetated shoreline near RM 4.8
West Shoreline	4443	W	Heavily vegetated shoreline near RM 4.55
West Shoreline and Piles	4446	SW	Four piles along the shoreline near RM 4.65. The shoreline in the background is riprap protected and vegetated.
West Shoreline	4447	N	Riprap-protected shoreline near RM 4.55
West Shoreline	4457	W	Vegetated, natural shoreline near RM 4.7
West Shoreline	4462	NW	Riprap-protected shoreline near RM 4.45
West Shoreline and Pile Stubs	4465	NW	Riprap-protected shoreline and numerous pile stubs along the shoreline near RM 4.4
West Shoreline and Pile Stubs	4471	NW	Unprotected shoreline with pile stubs along the shoreline near RM 4.3
West Shoreline	4574	W	Riprap-protected shoreline near RM 0.1 (high tide)
West Shoreline	4578	W	Unprotected shoreline along inlet near RM 0.1
Pile Stubs	4585	N	Group of pile stubs near RM 0.15
West Shoreline	4586	W	Shoreline protected by logs near RM 0.15
West Shoreline	4653	SW	Unprotected, heavily vegetated shoreline west of Kellogg Island near RM 0.5
West Shoreline	4740	W	Steep vegetated shoreline near RM 0.85. A layer of brick is visible where the shoreline is eroded. There also appears to be a derelict timber bulkhead at the toe of slope.
West Shoreline	4742	W	Steep vegetated shoreline near RM 0.85. A layer of brick is visible where the shoreline is eroded.
West Shoreline	4744	NW	Steep vegetated shoreline near RM 0.85. A layer of brick is visible where the shoreline is eroded.
West Shoreline	4756	NW	Vegetated shoreline near RM 0.8

Lower Duwamish Waterway In-water Structure Survey

Assessment Date: 1/10/2018 – 2/1/2018

Element	Photo No.	Direction	Description / Comments
West Shoreline	4760	NW	Vegetated shoreline near RM 0.7 with miscellaneous pile stubs, posts, and logs
West Shoreline	4763	W	Small concrete bulkhead and pile stubs near RM 0.7
West Shoreline	4769	NW	Derelict timber bulkhead along the shoreline near RM 0.7
West Shoreline	4776	NW	Vegetated shoreline near RM 0.55
West Shoreline	4833	NW	Transition from riprap-protected shoreline to vegetated shoreline near RM 0.95
West Shoreline	5044	NW	Multiple timber pile stubs line the north shoreline of the inlet near RM 2.25
West Shoreline	5048	W	Riprap-protected shoreline along the south side of the inlet near RM 2.25
West Shoreline	5159	W	Scattered riprap shoreline with vegetation near RM 2.95
West Shoreline	5160	SW	Sandy beach near RM 3.05 with riprap-protected shoreline to the north and south
West Shoreline	5165	W	Large riprap protection along the shoreline near RM 3.1
West Shoreline	5169	SW	Riprap protection along the shoreline near RM 3.2
West Shoreline	5172	W	Large riprap protection/wall along the shoreline near RM 3.25
West Shoreline	5391	SW	Riprap-protected shoreline near RM 3.7 south of Terminal 117
West Shoreline	5394	W	Transition from riprap protections to vegetated shoreline near RM 3.8
West Shoreline	5398	W	Heavily vegetated top of bank with scattered riprap on the lower slope near RM 3.85. Erosion is present just above the waterline.
West Shoreline	5404	W	Heavily vegetated top of bank with scattered riprap on the lower slope near RM 3.9. Erosion is present just above the waterline.



3181



3193



3195



3215



3218



3317



3318



3322



3323



3336



3363



3377



3387



3971



3973



4066



4206



4209



4211



4245



4260



4265



4267



4269



4294



4297



4304



4306



4313



4332



4340



4369



4371



4386



4388



4392



4401



4409



4438



4441



4443



4446



4447



4457



4462



4465



4471



4574



4578



4585



4586



4653



4740



4742



4744



4756



4760



4763



4769



4776



4833



5044



5048



5159



5160



5165



5169



5172



5391



5394



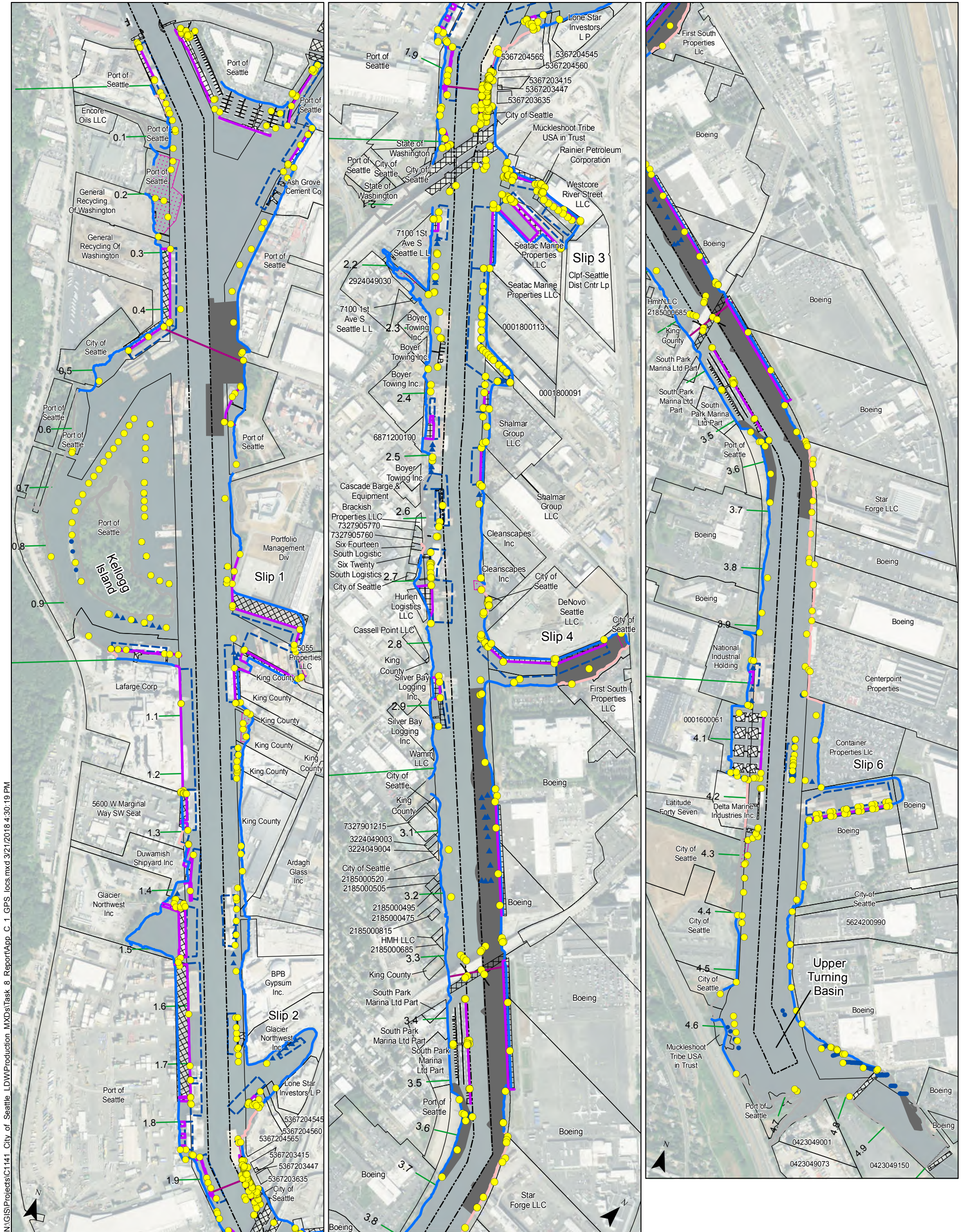
5398



5404

APPENDIX C

GLOBAL POSITIONING SYSTEM DATA

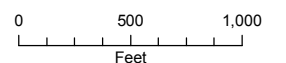


N:\GIS\Projects\C1141 City of Seattle LDWP\Production_MXD\Task 8 Report\Map C.1_GPS_locs.mxd 3/21/2018 4:30:19 PM

Notes:
1. Only tax parcel ID numbers are shown at locations where a property is owned by a private party/trust.

Sources:
1. Tax parcel ID numbers, parcel shapes and ownership obtained from the King County GIS Center and Parcel Viewer on January 18, 2017 (<http://www.kingcounty.gov/services/gis/Maps/parcel-viewer.aspx>)
2. In-water gps survey conducted by Convergent Pacific LLC (2018)
3. Aerial: NAIP 2015

- | | | |
|------------------------------|----------------------------|---------------|
| Early Action Area (29 acres) | Shoreline Structure | Pile |
| Overwater Structure | Armored Slope | Dolphin |
| Underwater Utility | Vertical Bulkhead | Pile Group |
| Navigation Channel | Exposed Bank | Berthing Area |
| River Mile Marker | Dock Face | |
| GPS Position Measurement | | |



Lower Duwamish Waterway Group
Port of Seattle / City of Seattle / King County / The Boeing Company

Appendix C.
Figure C-1: Global Positioning System Data