GRAYS HARBOR RAIL TERMINAL LLC
CRITICAL AREAS REPORT

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1 Summary

1.1 Name and Contact Information of the Applicant

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1.2 Permits Requested

Grays Harbor Rail Terminal LLC requests approval of critical areas alterations to wetlands, wetland buffers, and stream buffers, and approval of proposed compensatory mitigation.

1.3 Critical Areas Study Accuracy and Assumptions

HDR has made the following assumptions in preparing this report:

1) Data gathered from public information sources (i.e. public regulatory agencies) are accurate and reliable.
2) Site characteristics are based upon site inspections conducted in November 2011, May 2012, February 2013, January and March 2014, and no intentional concealment of environmental conditions has occurred.
3) Published information regarding critical areas and site observations made by an environmental professional are used to estimate the likely presence of critical areas. These estimates by the environmental professional are limited in accuracy and are generally cross referenced with existing information about similar sites and critical areas in the area.

Conducting the assessments to prepare this report is intended to reduce, but not entirely eliminate, uncertainty regarding the presence and condition of critical areas in connection with the project area within reasonable limits of time and cost. In conducting its services, HDR used a degree of care and skill ordinarily exercised under similar circumstances by reputable

members of its profession practicing in the same locality. No other warranty is made or intended.

1.4 Project Introduction

Grays Harbor Rail Terminal LLC is proposing to develop an oil export terminal supplied by an existing rail network in the City of Hoquiam, Washington. The proposed project is located approximately 1.5 miles west of downtown Hoquiam, near an existing wood chip mill and export terminal (Terminal 3) on the north shore of Grays Harbor. In general, the Grays Harbor rail terminal consists of constructing six to eight oil storage tanks, yard storage tracks, an aboveground delivery pipe from the tank site to the existing pier at Terminal 3, and a new dolphin mooring system at Terminal 3.

This document has been prepared to comply with the City of Hoquiam Critical Areas Ordinances requirements. It addresses wetlands, streams, and fish and wildlife habitat areas potentially impacted by project construction. Discussion of mitigation for those impacts will be addressed in a separate report.

1.5 Existing Conditions

HDR staff has identified a total of eight wetlands in the immediate vicinity of the project area. Six of these wetlands have buffers located within the project area; however, three wetlands have overlapping buffers due to their proximity. Where wetland buffers overlap, the largest of the buffer types was applied.

Habitat conservation areas within the project area, as designated by the City of Hoquiam, include the North Drainage Channel and Grays Harbor. Bull trout, green sturgeon, and Pacific eulachon are documented to occur in Grays Harbor, and peregrine falcon, a federal sensitive species, likely utilize the project area for foraging.

1.6 Wetland Impacts

Construction of the project will result in approximately 0.52 acres of permanent impacts in three of the eight wetlands located within the project area. Permanent impacts to one of the eight wetland buffers in the project area will total approximately 0.27 acres.

1.7 Habitat Conservation Area Impacts

There will be no permanent impacts to streams or stream buffers in the project area. Impacts to the North Drainage Channel will be limited to temporary impacts during construction of the railroad track near the channel and a culvert under the proposed railroad track. Installation of four new mooring dolphins will displace approximately 100 square feet of benthic habitat in Grays Harbor

1.8 Mitigation

Project improvements for the proposed project have been designed to avoid or minimize impacts to wetlands, streams, and buffers wherever feasible. Best Management Practices (BMPs) will also be implemented to limit the effects of construction on wetlands and fish and wildlife conservation areas. Compensatory mitigation will be provided for permanent wetland and buffer impacts and will be discussed in a separate wetland mitigation report.

2 Project Setting

The project is located on property owned by the Port of Grays Harbor in the City of Hoquiam, Washington (Township 17 North, Range 10 West, and Section 10). The project site is generally bounded by State Route (SR) 109 to the north, Paulson Road to the west, and Airport Way and an active chip mill facility to the south (Figure 1). The topography of the project area is generally flat ranging from 7 to 21 feet above mean sea level according to the topographic survey data.

3 Project Description

Grays Harbor Rail Terminal LLC (GHRT) is proposing a bulk liquids rail logistics facility at the Port of Grays Harbor Terminal 3 (T3) property. The facility will accommodate the receipt for export of not more than 45,000 barrels per day on average of various liquid bulk materials, specifically, various types of crude oil and condensates.

T3 is a 150 acre industrial site and includes an existing 600-foot- long concrete shipping terminal. The Port of Grays Harbor currently leases approximately 25 acres of the T3 site to a private tenant (Willis Enterprises), which utilizes the property for storing and sorting logs, and operating a wood chipping and processing facility. The tenant utilizes the existing wharf for product loading on to barges for export. The remaining area of the property (a former mill site) is occupied by 4 metal buildings and a rail spur line but is otherwise currently vacant.

The liquid bulk materials would be delivered to the proposed facility via unit trains in fully contained liquid bulk rail cars, unloaded into on-site storage tanks, and then loaded onto barges or other marine vessels for delivery to refineries.

The general layout of the proposed rail and off-loading facilities includes four 20-car yard tracks and two 20-car off-loading tracks (120 rail cars total). In addition, a “run-around” track would be used to reposition the locomotive engines and could also be used to hold cars awaiting maintenance. The off-loading spots would be equipped with permanent rack access structures where each rack structure would support connections for a maximum of 40 rail cars (20 spots on each side of a rack). The off-loading spots and central header would be located within secondary containment. The rack structures consist of elevated steel walkways with extendable access platforms used to access the tops of the rail cars. Off-loading would occur via 4-inch dry

break connections, hoses, valves, and risers connecting the bottom rail car couplers to a central piping header. The rail cars would be off-loaded by gravity feed into the central header.

The liquid bulk materials would be stored in approximately six to eight above-ground storage tanks with secondary containment and internal floating roofs until a marine vessel (ship or barge) arrives. All tanks will be located outside the Shoreline District. The total combined tank storage would be approximately 800,000 – 1,000,000 barrels. Construction of multiple storage tanks would allow the facility to accommodate interruptions in vessel schedules as well as changes in delivery volumes, and would allow the facility to maintain consistent operations. Vessel calls are anticipated by barge and Panamax vessels occurring approximately 3-4 times per month.

As noted above, T3 includes an existing 600-foot-long concrete shipping terminal. There are currently four mooring dolphins (three downstream/one upstream) off the existing concrete wharf. Up to four additional mooring dolphins (two downstream and two upstream) would be constructed to minimize vessel movements during liquid bulk materials transfer. No additional overwater expansion of the wharf is proposed. The existing trestle (supporting the Willis conveyor) and the wharf can accommodate the liquid bulk materials pipe rack needed to transfer the materials from the tanks to the vessels. Stormwater collection, drainage improvements, and spill containment measures would be added to the existing wharf but no structural modifications are necessary.

To facilitate operations at the Grays Harbor Rail Terminal, the Puget Sound and Pacific Railroad would be permitting and supervising construction of an industrial lead track extension of their main line railroad system. This industrial lead track would extend from the current main line rail terminus, just east of Paulson Road, for approximately 1,300 lineal feet to the west. The industrial lead track would allow for the backing of rail cars strings into the project site and provide additional rail car storage for other Port tenants. The identification of the industrial lead track is to account for potential indirect or cumulative environmental impacts for the purposes of the State Environmental Policy Act (SEPA) only and is not a project component of the Grays Harbor Rail Terminal site development permitting.

4 Applicable Regulations

Wetlands, streams, and other sensitive resources in the project vicinity are subject to federal, state, and local regulations. The following sections outline the regulations for each of these three levels of government.

4.1 Federal Regulations

All of the wetlands and streams identified at this site are considered Waters of the United States, and are assumed to be under federal jurisdiction. Section 404 of the Clean Water Act

(CWA) regulates placement of fill in Waters of the United States, and is administered by the U.S. Army Corps of Engineers (USACE).

Projects with the potential to affect threatened and endangered fish and wildlife must be evaluated in accordance with Section 7(c) of the Endangered Species Act (ESA) of 1973. HDR will prepare documentation to determine whether federally listed or candidate species in the project vicinity will be affected by project construction and operation.

4.2 State of Washington Regulations

Activities that affect wetlands and streams may require a water quality certification (CWA Section 401), which is implemented at the state level by the Washington State Department of Ecology (WDOE). WDOE reviews projects for compliance with state water quality standards and makes permitting and mitigation decisions based on the nature and extent of impacts, and the type and quality of wetlands/streams being affected.

Activities that use, divert, obstruct, or change the flow of a Water of the State, including some wetlands, may also require a Hydraulic Project Approval (HPA) permit. The Washington Department of Fish and Wildlife (WDFW) is responsible for implementing HPAs under the State Hydraulic Code.

4.3 Local Regulations

Local regulations related to critical areas include provisions of the shoreline management act and local critical areas ordinances. These regulations are discussed in greater detail below.

The City of Hoquiam regulates activities in critical areas and applicable buffers under its Municipal Code (Hoquiam Municipal Code [HMC] Title 11). In addition to the wetland regulations, the City of Hoquiam identifies Fish and Wildlife Habitat Conservation Areas (FWHCAs), which include areas endangered, threatened, and sensitive species have a primary association; waters of the State; State natural area preserves and natural conservation areas; and streams and rivers planted with game fish by a governmental agency (HMC 11.06.230).

The laws and policies of each jurisdiction vary with respect to procedural (permit) requirements as well as wetland and FWHCA classifications, required buffer widths, and mitigation requirements.

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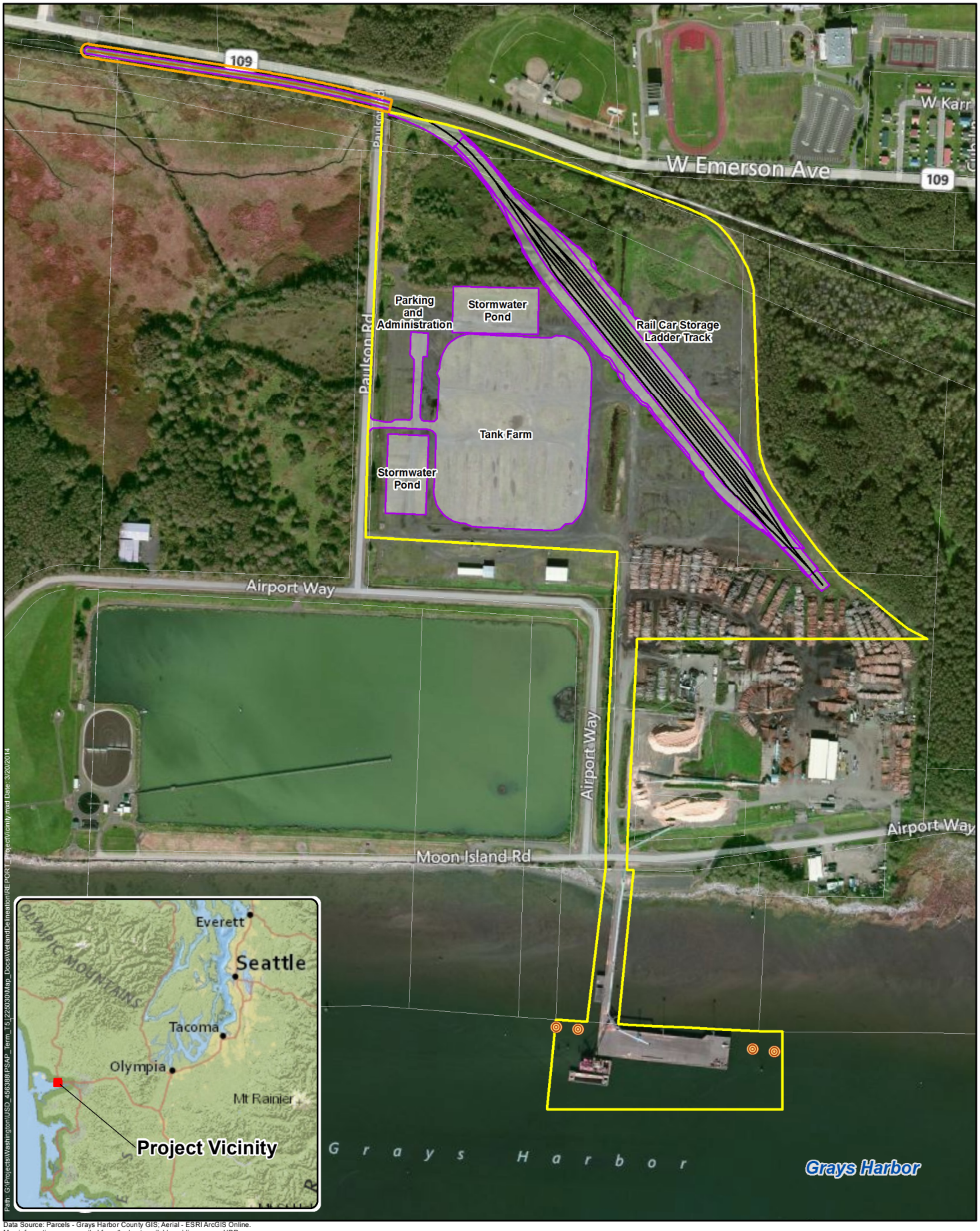

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Data Source: Parcels - Grays Harbor County GIS; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

New Mooring Dolphins
Project Railroad Track
Industrial Lead Railroad Track
Parcel
Detention/Infill Pond, Tank Farm, Rail Car Unloading Tracks
Project Area
Industrial Lead Track

0 125 250 500 Feet

Figure 1 Project Vicinity Map
Grays Harbor Rail Terminal

Terminal 3 – Port of Grays Harbor, Hoquiam WA
US Development Group LLC

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5 Study Methods

The study area consists of 12 parcels primarily owned by Port of Grays Harbor and the City of Hoquiam (Parcels 56401000101, 56401000501, 56401000801, 56401000400, 56401000201, 56401100204, 56401100201, 56401100202, 56401100100, 56401100203, 517100331007, and 517101021001). Critical areas outside of the study area were assessed based on characteristics visible from public rights-of-way and in existing documents and studies, maps and aerial photographs.

A two step process was used to determine the presence of wetlands and fish and wildlife habitat conservation areas (FWHCA) in the study area. In step one, HDR staff reviewed existing environmental documents. The second step was a field investigation. The initial field investigation was followed by delineation of wetlands and FWHCAs within the study area. These steps and the results are discussed in detail below.

5.1 Document Review

HDR Staff reviewed the following existing environmental documents to determine the presumed presence of wetlands and FWHCA's in the project study area:

- Soil Survey of Grays Harbor County Area, Washington (USDA NRCS 2014)
- National Wetland Inventory Web site maps (USFWS 2014)
- Grays Harbor County Critical Area Ordinance Wetland Areas Map (obtained July 2010)
- Salmon and Steelhead Habitat Limiting Factors, Water Resource Inventory Areas 22 and 23 (Smith and Wegner 2001)
- WDFW (2014b) SalmonScape
- WDFW (2014a) Priority Habitat and Species List
- WDNR (2014) Natural Heritage Information Request Self-Service System
- Federal Emergency Management Agency (FEMA 2014) Flood Insurance Rate Maps for Hoquiam, Grays Harbor Country;
- Geologic Map of the South Half of the Shelton and South Half of the Copalis Beach Quadrangles, Washington (Logan 1987)
- Geologic Map of the Humptulips Quadrangle and Adjacent Areas, Grays Harbor County, Washington (Rau 1986)
- Earthquake-Induced Landslide and Liquefaction Susceptibility and Initiation Potential Maps for Tsunami Inundation Zones in Aberdeen, Hoquiam, and Cosmopolis, Grays Harbor County, Washington, for a M9+ Cascadia Subduction Zone Event (Slaughter et al. 2013)

- Draft Geotechnical Report for USD Cruide-by-Rail Terminal Port of Grays Harbor Hoquiam, Washington (Shannon and Wilson 2013)

5.2 Field Investigation

Field investigation consisted of an initial field reconnaissance and then followed by more detailed verification and delineation of wetlands and streams in the project area. HDR biologists conducted the field investigation on November 23, 2011, May 9, 2012, February 21 and 22, 2013, January 22, 2014, and March 10, 2014.

5.3 Wetlands

The project area was evaluated for the presence of wetlands using the three parameter methods described in the Corps of Engineers Wetland Delineation Manual (U.S. Army Corps of Engineers 1987) as updated by the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (USACE 2010) and the Washington State Wetlands Identification and Delineation Manual (Ecology 1997). A more detailed description of the field methods used in this study is provided in Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a).

Delineated wetland boundaries and wetland data plot locations in the study area were marked in the field using a Trimble Geo XT 2005 handheld GPS device, which is capable of sub meter accuracy. The resulting data were incorporated into project base maps.

5.3.1 Wetland Rating and Classification

Wetland ratings are used by regulatory agencies to help determine wetland buffers, mitigation replacement ratios, and permitted uses in wetlands. Ratings are based on a wetland's sensitivity to disturbance, rarity within a region, and functions. Generally, wetlands that have not been altered significantly due to urbanization have structural and spatial diversity, and which are hydrologically connected to streams have a high rating.

Wetland habitats in the project area were classified according to the system outlined by the U.S. Fish and Wildlife Service in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). The Cowardin system allows for the classification of wetlands based on their vegetation and hydrologic characteristics.

The City of Hoquiam requires that wetlands be rated using the state wetland rating system as described in Washington State Wetland Rating System for Western Washington – Revised, Washington State Department of Ecology Publication # 04-06-025 (Hruby 2004). Using this system, wetlands were assessed a rating in the field by using the Wetlands Rating Field Data Form provided with the rating system manual (Grays Harbor Rail Terminal Wetlands Technical Report (HDR 2014a)). Table 1 displays the wetland rating criteria for WDOE.

Wetland buffer widths have also been assigned to wetlands based on their classification. The City of Hoquiam prescribes wetland buffer widths based on the intensity of proposed land use. The proposed project will require the high-intensity land use buffer widths outlined in HMC 11.06.140. Buffer widths in the City of Hoquiam do not include those areas that are functionally and effectively disconnected from the wetland by roads or other such structures. These buffer widths are shown in Table 2.

Functions of individual wetlands were assessed based on the Washington State Wetland Rating System for Western Washington – Revised (Hruby, 2004). The WDOE system scores wetlands based on water quality, hydrologic, and habitat functions. These function scores provide a baseline measurement of wetland functions. Maps, aerial photographs, and existing documents supplemented with field visits were used to provide the background information for the assessment of wetland functions.

Table 1. Wetland Rating System for the City of Hoquiam

Regulatory Agency	Category			
	I	II	III	IV
Washington State Department of Ecology	Category I Wetlands: Represent a unique or rare wetland type; or Are more sensitive to disturbance than most wetlands; or Are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or Provide a high level of functions. Specific wetlands that meet the Category I criteria include: 1. Relatively undisturbed estuarine wetlands over one acre in size; or 2. Natural Heritage Wetlands, specifically, Wetlands identified by the Washington Natural Heritage Program/DNR as high quality relatively undisturbed wetlands; and Wetlands that support State listed threatened or endangered plants; 3. Bogs; 4. Mature and old-growth forested wetlands over one acre in size; 5. Wetlands in coastal lagoons; and 6. Wetlands that perform many functions very well, as indicated by a score of 70 or more points out of 100 on the wetland rating form.	Category II wetlands are difficult, though not impossible; to replace, and provide high levels of some functions. Specific wetlands that meet the Category II criteria include 1. Estuarine wetlands less than one acre in size, or disturbed estuarine wetlands larger than one acre; 2. Interdunal wetlands greater than one acre; and 3. Wetlands scoring between 51 and 69 points out of 100 on the wetland rating form.	Category III wetlands provide a moderate level of functions. Specific wetlands that meet the Category III criteria include: 1. Wetlands scoring between 30 and 50 points out of 100 on the wetland rating form; and 2. Interdunal wetlands between 0.1 acre and 1.0 acre in size.	Category IV Wetlands have the lowest levels of functions and are heavily disturbed. Specific wetlands that meet the Category IV criteria include: 1. Wetlands scoring less than 30 points out of 100 on the wetland rating form.

[a] Hruby (2004)

Table 2. Summary of Required Wetland Buffer Widths in the City of Hoquiam

Wetland Category	Description	High-Intensity Land Use Buffer Width (ft)[a]	Other Measures Recommended for Protection
Category I	Washington Natural Heritage Program/DNR high quality wetlands	250	No additional surface discharges to wetland or its tributaries No septic systems within 300 feet of wetland Restore degraded parts of buffer
	Bogs	250	No additional surface discharges to wetland or its tributaries Restore degraded parts of buffer
	Forested	Buffer to be based on score for habitat functions or water quality functions	If forested wetland scores high for habitat, need to maintain connections to other habitat areas
	Estuarine	200	No additional measures at this time
	Wetlands in Coastal lagoons	200	No additional measures at this time
	High Level Habitat Function (habitat function score is 29-36)	300	Restore degraded parts of buffer Maintain connections to other habitat areas
	Moderate Level Habitat Function (habitat function score is 20-28)	150	No additional measures at this time
	High level of function for water quality improvement (24-32 points) and low for habitat (less than 20 points)	100	No additional surface discharges of untreated runoff
	Not meeting above characteristics	100	No additional measures at this time
Category II	Estuarine	150	No additional measures at this time
	High level of function for habitat (habitat function score is 29-36)	300	Maintain connections to other habitat areas
	Moderate level of function for habitat (habitat function score is 20-28)	150	No additional measures at this time
	High level of function for water quality improvement and low for habitat (water quality function score is 24 – 32 and habitat function score is less than 20)	100	No additional surface discharges of untreated runoff
	Not meeting above characteristics	100	No additional measures at this time
Category III	Moderate Level Habitat Function (habitat function score is 20-28)	150	No additional measures at this time
	Total score of 30-50 but not meeting above criteria	80	No additional measures at this time
Category IV	Total score for all functions less than 30 points	50	No additional measures at this time

[a] Wetland buffers are based on City of Hoquiam Municipal Code Chapter 11.06.

5.4 Fish and Wildlife Habitat Conservation Areas

Potential FWHCAs were identified in the project area using City of Hoquiam definitions under Fish and Wildlife Habitat Conservation Areas (HMC 11.06.010). Fish and Wildlife Habitat Conservation Areas that most commonly occur in the project area are waters of the state. These waters have been categorized according to the stream definitions and typing systems detailed in HMC 11.06.010 (Table 3). The stream types shown in this report are based on the stream reaches within the project area; downstream reaches may be rated higher. Buffer widths have also been assigned to streams based on their classification, and are shown in Table 3.

Table 3. Summary of the Water Typing System for the City of Hoquiam

Stream Type	Definition[a]	Buffer Width (in feet)
S	All waters within their bankfull width as inventoried as shorelines of the state under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.	150
F	Segments of natural waters other than Type S waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of one-half acre or greater at seasonal low water and which in any case contain fish habitat.	150 (greater than 10 feet wide) 100 (less than 10 feet wide)
Np	All segments of natural waters within the bankfull width of defined channels that are perennial non-fish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.	75
Ns	All segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np waters.	50

[a] Definitions are summarized from Hoquiam Municipal Code 11.06.010

HDR biologists also identified other potential FWHCAs in the project vicinity using data provided by the WDFW (2014a) Priority Habitats and Species (PHS) database, WDFW (2014) SalmonScape online maps, WDNR (2014), species lists provided by USFWS and National Marine Fisheries Service (NMFS).

5.4.1 Streams

Under Section 404 of the CWA, the limits of the Corps' jurisdiction is the line of Mean Higher High Water (MHHW). In order to determine the MHHW of tidal waters in the study area (Grays Harbor), HDR utilized the USACE (2014) definition: “the average higher high tide at a

benchmark over a period of 20 years." Portions of the study area also fall below the line of Mean High Water (MHW) and are thus under the jurisdiction of the USACE under the Section 10 of the Rivers and Harbors Act. The USACE defines MHW of tidal waters as "the average of all the high water heights observed over a period of 20 years (USACE 2014)." MHHW and MHW for tidally influenced wetlands and waterbodies were flagged and surveyed in the field.

Fish presence in the study area was evaluated using backpack electrofishing on May 9, 2012 and March 10, 2014. Sampling was conducted using a single pass method with a backpack electrofisher that has 1 hand-held anode pole and a trailing cathode. A hand held GPS unit was used to obtain the location of the start and end of the electrofishing effort. Fish collected during the sampling were placed in a water filled bucket. After each approximately 100 meter length of the channel was completed (or less if more than a few fish were collected), the fish held in the buckets were identified and enumerated. This was done downstream of the next sampling event or in the location where numerous fish were collected, to allow immediate fish release into the channel after identification and measurement. All fish greater than 20 millimeters in length collected during the sampling effort were identified to species. Any fish found that are smaller than this are difficult to accurately identify to species and were enumerated and identified as far as possible. The collected fish were also examined for external anomalies (i.e., deformities, eroded fins, lesions, and tumors), and their fork lengths were recorded.

HDR biologists also assessed stream characteristics within the study area by running transect lines across a stream channel. Physical and chemical characterization of water quality was also sampled at several points along stream channels within the study area. The instantaneous water quality measurements were made with a YSI 556 multi-probe meter and a Hach 2100P Turbidimeter. As part of these water quality measurements, conductivity was also measured prior to commencing electrofishing in order to fine tune the voltage and settings for the electrofishing. Measurements were taken during a high tide and a low tide for comparison. A more detailed description of fish sampling and habitat metrics is included in the Grays Harbor Rail Terminal LLC Fish Habitat Technical Report (HDR 2014b)

5.4.2 Intertidal Habitat

Benthic infaunal communities and intertidal benthic habitat were quantitatively characterized in the study area in 2012 and 2014. More information about this study is described in the Grays Harbor Rail Terminal LLC Intertidal Technical Report (HDR 2014c).

Intertidal habitat in the project area was characterized by making observations along four approximately equally spaced transects. The transects were oriented perpendicular to the shoreline, starting at the shoreline and extending as far waterward as possible, given the low tide and safety limitations. At each transect, observations were made at 20 meter (m) intervals. At each observation point a 0.25 m^2 quadrat was placed on the beach. The following observations were made within each quadrat:

- Percent sediment composition
- Macroalgae and eelgrass presence
- Macroalgae and eelgrass composition and percent cover

The slope was measured with a clinometer between observation points. Quadrat locations were imported into GIS and mapped on aerial photos with elevation contours. Elevation contours were developed from remotely sensed Lidar data.

In March 2014, the high marsh was characterized, in terms of general elevation and plant composition. The distribution of tidal channels was mapped with both aerial photo interpretation and field mapping. The tidal channels were characterized, in terms of their upland extent, bankfull width, and bankfull depth.

HDR biologists also conducted an intertidal benthic infaunal survey in the sand and mudflat intertidal zone, with a Before-After-Control-Impact (BACI) monitoring design. The 2012 monitoring established baseline conditions before construction and operation of the proposed Project. Two sample transects in the project area were located just west of the Terminal 3 wharf, and are intended to capture any construction or operational impacts from the project. The control reach is located approximately 1 mile west of the project area and two corresponding transects were sampled there during the same week as the project area reach. The control reach is intended to be relatively similar to the project area, but would not be as susceptible to any unforeseen project impacts.

Each reach was sampled according to the general protocol used by the Washington Department of Natural Resources (WDNR). At both the impact and control reaches, a tape measure was used to delineate a 50 m transect parallel to the water line at both the mean sea level (MSL) and mean low water (MLW) elevations. This elevation and position along the shoreline was determined with tide tables. The MLW elevation and transect locations was delineated during an outgoing tide. Ten locations were randomly selected along each 50 m transect. At each location, a 0.25 m2 quadrat was placed next to the tape measure. Within the quadrat, seagrasses, macroalgae, and invertebrates that were visible on the beach surface were identified and enumerated. Sediment composition, percent vegetative cover, and pore water salinity were measured. One 10 cm (diameter) x 15 cm (depth) core sample was taken within each quadrat. Each core sample was processed through a 1.0-mm mesh sieve using in-situ seawater. The in situ seawater was pre-sieved with a 0.25-mm mesh sieve to remove any animals in the target size fraction (i.e. >1.0-mm). The material retained on each sieve (i.e. each replicate sample) was transferred into a wide-mouth 500 ml polypropylene jar, labeled, and preserved with a 5% aqueous solution of borax-buffered formalin. After core samples were processed, one additional quadrat per transect was excavated with a shovel to approximately 0.5 m depth. Excavated sediment was searched for bivalves. Approximately 10 days after field work, the core samples were re-screened with 70% ethanol. The samples were then shipped to Aquamarine, Inc. for sorting and taxonomic identification. All invertebrates were sorted out of the samples and identified to the lowest practical level (Ecology 2007).

5.5 Geologically Hazardous Areas

HDR staff evaluated geologically hazardous areas within the study area per HMC 11.06.200 based on Soil Survey of Grays Harbor County Area (USDA, NRCS. 2014) and Geologic Map of the South Half of the Shelton and South Half of the Copalis Beach Quadrangles (Logan 1987) as well as other maps and documents listed in Section 5.1. For this project, a separate Geotechnical Report was also prepared by Shannon and Wilson, which discusses existing geologically hazardous areas in more detail.

5.6 Frequently Flooded Areas

HDR staff evaluated potential frequently flooded areas within the study area per HMC 11.06.270. The City of Hoquiam adopts the areas of special flood hazard identified by the Federal Emergent Management Agency (FEMA) in a scientific and engineering report entitled "The Flood Insurance Study for the City of Hoquiam, Washington," dated June 15, 1979, with accompanying flood insurance rate maps. Special flood hazard areas in the study area were identified using the Flood Insurance Rate Map (FIRM) Community Panel Number 5300610005B and 5300570425B.

6 Results

6.1 Site Description

Grays Harbor is a large, shallow estuary of the Chehalis River. The study area is located on former tidelands adjacent to Grays Harbor which historic maps indicate have been subject to broad-scale fill events over the last 70 years as part of the creation of a man-made waterfront. In 1942, the area between Paulson and South Adams streets, which includes the study area, appears to be part of the tidally influenced estuarine and mudflat systems of Grays Harbor. The only fill visible in the study area is the road leading to the Bowerman Airport.

During a 1960s urban renewal project, the study area was bulldozed and filled up to 10 feet thick with hydro-dredged fill material (Tierra Right of Way Services 2013). Aerial photography shows the development of a levee and dike system just north of the retention basin at Moon Island and Paulson Roads by 1971. A 1976 USACE report examining conditions at three proposed dredge disposal sites describes the bulk of the property as fill (Munsell 1976).

In 1976, Rayonier, a forest products company, purchased 17.0 acres (6.9 ha) of land in what is now referred to as Bowerman Basin, for use as a log storage yard (Friends of the Earth v. Hintz 1986). In 1978, the company began filling the wetland with wood waste under a shoreline conditional use permit. Fill materials include quarry spalls atop milled wood debris of variable thickness, atop hydraulic fill of variable thickness (Tierra Right of Way Services 2013). While Rayonier's action was later contested based on USACE jurisdiction of the area under the CWA, the USACE issued Rayonier a retroactive Section 404 permit for the site on January 10, 1983.

Aerial imagery from 1983 supports written documentation of fill placement over the majority of the study area. Filled areas include all but a small area located in the northwest corner of the study area (described in this report as Wetlands B and M) near the intersection between Paulson Road and SR 109.

In 1988, the U.S. Congress authorized establishment of the Grays Harbor National Wildlife Refuge (Refuge) consisting of 1,500 acres of the remaining mudflats, salt marsh, and uplands within Bowerman Basin. The Refuge is located west of Paulson Road and receives runoff from the study area through two culverts draining under Paulson Road.

By 1990, only a portion of the Terminal 3 site appears to be in active use as a log sorting and storage area. The northern portion of the study area appears to be partially re-vegetated with a sparse ground cover visible along the edges of the filled area.

Today, approximately 25 acres of the Terminal 3 fill area are leased and in use as a log sorting and storage facility. Within the study area, re-vegetation of the northern portion of the site appears to have continued with several taller shrubs visible among herbaceous ground cover. However, the majority of the study area remains un-vegetated fill. The study area is generally flat but characterized by several drainage features which convey runoff from upland areas out of the study area into the Refuge and directly into Grays Harbor

6.2 Wetlands

HDR scientists identified 8 wetlands within the study area totaling 5.94 acres. Wetlands were distinguished from adjoining uplands by the presence of indicators of wetland hydrology, hydric soils, and hydrophytic vegetation.

Table 4 summarizes the size, rating, and classification of all wetlands found within the study area. Figures 2 and 3 show the locations of all wetlands and field plots located in the study area. Detailed descriptions of each wetland are provided in the following sections. Wetland Determination Forms and Ecology rating forms for wetlands within the study area are provided in Grays Harbor Rail Terminal LLC Wetlands Technical Report, and site photographs are provided in Appendix A of this report.

Table 4. Wetland Size, Rating, and Classification for Wetlands Mapped in the Study Area

Name	Size in Study Area (acres)[a]	Ecology Rating[b]	Hydrogeomorphic (HGM) Classification	Cowardin Classification[c]	Dominant species
B	4.32	Category III	Depressional	PEM1, PSS1/EM1, PFO1, PEM1V	*Phalaris arundinacea, Agrostis capillaris, Rubus armeniacus, Salix hookeriana*, *Cytisus scoparius*
F	0.47	Category III	Depressional	PEM1	*Juncus effusus*, *Typha latifolia*
I	0.24	Category IV	Depressional	PEM1	*Phalaris arundinacea*, *Equisetum telmateia*
K	0.28	Category IV	Depressional	PEM1, PUB	*Phalaris arundinacea, Festuca rubra*; *Juncus effusus; Lotus corniculatus*
L	0.03	Category IV	Depressional	PEM1, PUB	*Phalaris arundinacea*; *Juncus effusus*
M	0.34	Category II	Tidal	E2EM1N, PEM1	*Carex lyngbyei ; Phalaris arundinacea*,
WW2	0.16	Category III	Depressional	PFO1, PEM1	*Alnus rubra*; *Phalaris arundinacea*; *Oenanthe sarmentosa*; *Carex obnupta*;
WW3	0.10	Category III	Depressional	PFO1	*Salix hookeriana*; *Alnus rubra*; *Carex obnupta*; *Rubus spectabilis*; *Athyrium filix-femina*

[a] Wetland size is estimated based on wetland boundaries delineated during field investigations
[b] Wetland ratings are based Washington State Wetland Rating System for Western Washington – Revised (Hruby 2004).
[c] Based on Cowardin *et al*. 1979

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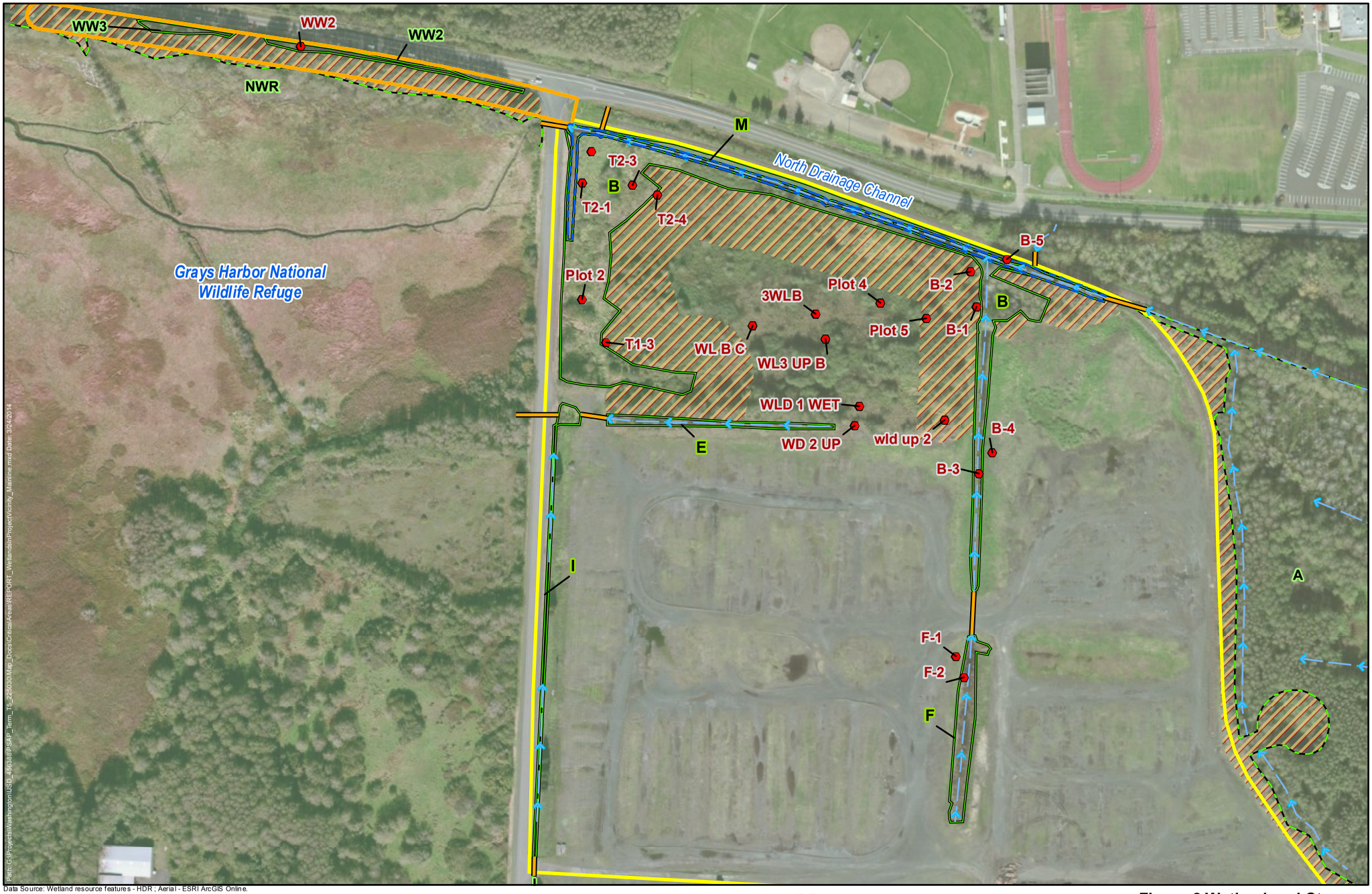

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Data Source: Wetland resource features - HDR ; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

HDR

0 125 250 500 Feet

Sample Plot
Culvert
Water Flow
MHHW
Wetlands within the project boundary
Approximate wetland boundary outside the project area
Wetland Buffer
Project Area
Industrial Lead Track

Figure 2 Wetland and Streams within the Study Area
Grays Harbor Rail Terminal

Terminal 3 – Port of Grays Harbor, Hoquiam WA
US Development Group LLC

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Data Source: Wetland resource features - HDR ; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

Sample Plot
Culvert
Water Flow
MHHW
Wetland within the project boundary
Approximate wetland boundary
Wetland Buffer
Project Area

0 100 200 400 Feet

Figure 3 Wetlands and Streams within the Study Area
Grays Harbor Rail Terminal

Terminal 3 – Port of Grays Harbor, Hoquiam WA
US Development Group LLC

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6.2.1 Wetland B

Size in Study Area: 4.32 acres/ **Overall Size:** 4.32 acres

NWI Code: Palustrine persistent emergent wetland (PEM1) with inclusions of palustrine broad-leaved scrub-shrub/persistent emergent (PSS1/EM1) and palustrine broad-leaved deciduous forested (PFO1) wetlands.

HGM Class: Depressional

Wetland Rating: Category III

Wetland Description

Wetland B is a low-lying vegetated area located near the northwest corner of the study area near the intersection of Paulson Road and the existing PSAP mainline track embankment (Figure 2). Wetland B is located adjacent to and partially encloses Wetland M; however, the two areas are evaluated separately due to different hydrologic inputs (Depressional versus Tidal). While most of Wetland B is characterized by a saturated water regime, the backflow of saline or brackish water in Wetland M (see Section 6.2.6, below) combines with freshwater runoff from Wetlands A (located out of the Project Area to the east) and B to create a system of permanently flooded, freshwater tidal hydrology (PEM1V) located along the edge of the fill embankment for the mainline track. Based on GIS analysis, however, the freshwater tidal area represents less that 10 percent of the overall assessment unit. As a result, the freshwater tidal area is mapped and evaluated as part of the overall Wetland B area.

Wetland B is dominated by persistent emergent vegetation with small inclusions of mixed shrub/emergent wetland habitats. Based on its location adjacent to and with hydrologic connection to Wetland M, Wetland B would likely be regulated by the USACE and the State of Washington.

Vegetation

Wetland B is characterized by persistent emergent herbaceous vegetation. Dominant species include reed canary grass (*Phalaris arundinacea*; FACW) and colonial bent grass (*Agrostis capillaris*; FAC) with smaller percentages of perennial pea (*Lathyrus latifolius*; NI), Lyngbye's sedge (Carex lyngbyei; OBL), lamp rush (Juncus effusus; FACW), broad-leaf cattail (*Typha latifolia*; OBL), and Pacific water-dropwort (*Oenanthe sarmentosa*; OBL). Occasional inclusions of shrubby vegetation include Scotch broom (*Cytisus scoparius*; UPL), coastal willow (*Salix hookeriana*; FACW), black hawthorn (*Crataegus douglasii*; FAC), cut-leaf blackberry (*Rubus laciniatus*, FACU), Himalayan blackberry (*Rubus armeniacus*), and red alder (*Alnus rubra*). The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed in Wetland B are primarily silty or sandy loams characterized by brown (7.5YR 4/2), or grayish brown (10YR 5/2, 2.5Y 5/2, or 2.5Y 4/2) surface or shallow subsurface layers

with common dark brown (7.5 3/4), brown (7.5YR 4/4), or dark yellowish brown (10YR 4/4) redoximorphic features. The redoxomorphic features ranged in abundance from 5 to 20 percent. These soils meet the criteria for the Depleted Matrix indicator (F3) for hydric soils. One soil (Plot 2) also met the criteria for Hydrogen Sulfide (A4) indicator with hydrogen sulfide odor detected within 12 inches of the soil surface.

Soils observed at Plot B-5 are characterized by a black (10YR 2/1) fine sandy loam layer to a depth of 12 inches, containing common (10 percent) redoximorphic features with a strong brown color (7.5YR 4/6). This soil meets the criteria for the Redox Dark Surface indicator (F6) for hydric soils. This soil also contained a layer that meets the criteria for a depleted matrix (2.5Y 4/1 and 2.5Y 5/1 matrix colors with 15 percent 7.5YR 4/6 redoximorphic features) starting greater than 12 inches below the soil surface. As a result, this soil and meets the criteria for the Thick Dark Surface (A12) indicator for hydric soils.

Hydrology

The most common indicators of wetland hydrology observed in Wetland B were a High Water Table (A2) and Saturation (A3). The water table ranged in height between sites from 0 to 12 inches below soil surface. Saturation within 12 inches or less of the soil surface was observed at all sites sampled in Wetland B. Saturation ranged in depth from the 0 to 10 inches below soil surface. A Hydrogen Sulfide Odor (C1) and Iron Deposits (B5) were also observed at one site (Plot 2). These indicators meet the wetland hydrology criterion.

Wetland Rating

Wetland B is rated Category III in the Ecology rating system (Hruby 2004, Table 3). Wetland B scored low-moderate for water quality functions (12/32 points), very low for hydrologic functions (3/32 points), and moderate for habitat functions (20/36 points) for an overall total of 35 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The moderate habitat function score reflects the presence of two types of vegetation structures (both shrub and emergent Cowardin classes) with moderate interspersion between classes, multiple types of water regimes, and special habitat features (thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying and the presence of stable steep banks). The wetland is located within 330 feet of priority habitats listed by WDFW including a riparian area and a biodiversity area/corridor (WDFW 2008). A March 2014 fish survey confirmed the presence of coho and chum salmon throughout the freshwater tidal portion of Wetland B (HDR 2014b). Habitat characteristics of the freshwater tidal

The low-moderate water quality function reflects the lack of a constricted outlet, the lack of clay or organic soil layers, and the relatively small seasonally ponded area. Wetland B does, however, have a high percentage of persistent, ungrazed, emergent vegetation as well as the opportunity to improve water quality. Hydrologic function in Wetland B is limited due to little

depth of storage, the presence of an unrestricted surface outlet, and the lack of opportunity to reduce flooding and erosion.

Buffer Width

Where high-intensity land use is proposed, the City of Hoquiam requires a 150-foot buffer on Category III wetlands. However, the existing railroad track cuts off the buffer on the north side, and Paulson Road cuts off the buffer on the west side. The south side of the buffer only extends up to the un-vegetated existing fill area. The vegetated buffers on the south side of Wetland B mainly consists of red alder, Himalayan blackberry, Scotch broom, sword fern (*Polystichum munitum*), and reed canarygrass. A patch of Japanese knotweed (*Reynoutria japonica*) is also present in the northeastern corner of the Wetland B buffer.

6.2.2 Wetland F

Size in Study Area: 0.47 acres/ **Overall Size:** 0.47 acres
NWI Code: Palustrine persistent emergent wetland (PEM1)
HGM Class: Depressional
Wetland Rating: Category III

Wetland Description

Wetland F is a broad, flat, cattail-dominated ditch. It appears to have been excavated to support site drainage and stormwater treatment and it receives runoff from the adjacent log yard and chipping facility. Surface water ponded in the wetland area drains north via a culvert into the southern portion of Wetland B (Figure 2). Despite its potential anthropogenic origins, Wetland F would likely be regulated by both the USACE and the State of Washington as it meets wetland criteria and has a surface water connection to Wetland B.

Vegetation

Vegetation within Wetland F is dominated by lamp rush and broad-leaved cattail. Common velvet grass (*Holcus lanatus*, FAC), reed canary grass, and black medick (*Medicago lupulina*, FACU) were also present but not dominant. The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed in Wetland F consist of very dark gray (10YR 3/1) loam with common brown (7.5YR 4/4) redoximorphic features to a depth of 13 inches below soil surface. Soils observed in Wetland F meet the Redox Dark Surface (F6) criteria for hydric soils.

Hydrology

Surface water up to 8 inches deep was observed in Wetland F. The water table and saturation were both observed at the soil surface. These meet the criteria for the Surface Water (A1), High Water Table (A2), and Saturation (A3) wetland hydrology criterion.

Wetland Rating

Wetland F is rated Category III in the Ecology rating system (Hruby 2004, Table 3). It scores as moderate for water quality (14/32 points), very low for hydrologic function (8/32 points), and moderate for habitat functions (12/36 points) for an overall total of 34 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The moderate water quality function reflects the high percentage of persistent, ungrazed, emergent vegetation as well as an intermittently flowing outlet. Wetland F was observed to have the opportunity to improve water quality as it receives untreated stormwater discharge and is adjacent to an industrial development. The moderate habitat function score relates to the presence of special habitat features including thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying and less than 25 percent cover of invasive species. Wetland F is located within 330 feet of priority habitats listed by WDFW including a riparian area and a biodiversity area/corridor (WDFW 2008).

Hydrologic function in Wetland F is limited due to little depth of storage, limited contribution to basin storage based on the relative size of the wetland, and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires an 80-foot-wide buffer for Category III wetlands that receive less than 20 habitat points with high-intensity land use. However, no buffer is present for Wetland F because it is surrounded by existing fill materials that include quarry spalls and the areas surrounding the wetland are un-vegetated.

6.2.3 Wetland I

Size in Study Area: 0.24 acres / **Overall Size:** 0.91 acres
NWI Code: Palustrine persistent emergent wetland (PEM1)
HGM Class: Depressional
Wetland Rating: Category III

Wetland Description

Wetland I is a vegetated, drainage ditch that conveys roadside runoff and runoff from the log yard and chipping facility. Water movement is from the southeast to the northwest along the east side of Paulson Road (Figure 2). During the field investigation, HDR scientists noted that

Wetland I did not display gravel or large wood habitat elements typically associated with streams and fish habitat.

At its northern end, Wetland I receives water from a deep excavation ditch located east of the wetland via a culvert. This ditch is referred as Waterbody E. Water from both Wetland I and Waterbody E then discharges via a culvert under Paulson Road into the Refuge. As Wetland I has a surface water connection to tidally influenced wetlands with the Refuge, it would likely be regulated by both the USACE and the State of Washington.

Vegetation

Vegetation within Wetland I is dominated by reed canary grass and giant horsetail (*Equisetum telmateia*; FACW). Broad-leaved cattail, slough sedge (*Carex obnupta*; OBL), and lamp rush are also present but not dominant. The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed in Wetland I consist of dark grayish brown (10YR 4/2) silt loam with underlain by a greenish gray (5GY 5/1) gleyed silt loam starting at 6 inches below the soil surface. The gleyed layer had common dark yellowish brown (10YR 4/4) redoximorphic features in the matrix. This soil meets the Loamy Gleyed Matrix (F2) criteria for hydric soils.

Hydrology

The water table was observed within 4 inches of the soil surface in Wetland I. Saturation was observed at the soil surface. These meet the criteria for the High Water Table (A2) and Saturation (A3) wetland hydrology criterion. HDR scientists also noted that water within Wetland I had very high turbidity and was a slate gray color.

Wetland Rating

Wetland I is rated Category IV in the Ecology rating system (Hruby 2004, Table 3). Wetland I scored moderate for water quality functions (12/32 points), very low for hydrologic functions (6/32 points), and low for habitat functions (9/36 points) for an overall total of 27 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The low habitat score reflects the presence of only one type of vegetation structure (emergent), no interspersion of habitats, and moderate plant species richness. Wetland I does, however, have thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying and the wetland is located within 330 feet of one priority habitat, a biodiversity area/corridor (WDFW 2008).

The moderate-low water quality function reflects the lack of a constricted outlet, the lack of clay or organic soil layers, and a moderately small seasonally ponded area. Wetland I does,

however, have a moderately high percentage of persistent, ungrazed, emergent vegetation as well as the opportunity to improve water quality. Hydrologic function in Wetland I is limited due to a moderately low depth of water storage, the presence of an unrestricted surface outlet, and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires a 50-foot-wide buffer for Category IV wetlands with high-intensity land use. However, there are no buffers for Wetland I because the wetland is surrounded by existing fill materials that include quarry spalls and the areas surrounding the wetland are un-vegetated.

6.2.4 Wetland K

Size in Study Area: 0.28 acres / **Overall Size:** 0.32 acres

NWI Code: Palustrine persistent emergent wetland (PEM1) with inclusions of un-vegetated open water with an unconsolidated bottom (PUB).

HGM Class: Depressional

Wetland Rating: Category IV

Description

Wetland K is a vegetated, excavated drainage ditch that conveys surface runoff from the log yard and chipping facility towards Grays Harbor. Water movement is generally from north to south although HDR scientists noted that water movement through the culvert that separates the two different sections of wetland K can be bi-directional. Wetland K drains south into Wetland L through a culvert. During the field investigation, HDR scientists noted that Wetland K did not display gravel or large wood habitat elements typically associated with streams and fish habitat. Despite its potential anthropogenic origins, Wetland K would likely be regulated by both the USACE and the State of Washington as it meets wetland criteria and has a surface water connection to Wetland L.

Vegetation

Vegetation within Wetland K is dominated by reed canary grass, red fescue (*Festuca rubra*; FAC), lamp rush, and garden bird's-foot-trefoil (*Lotus corniculatus*; FAC). Broad-leaved cattail, American brooklime (*Veronica americana*; OBL), and giant horsetail were also present but not dominant. The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed at Site K-1 consisted of very dark grayish brown (10YR 3/2) fine sandy loam. The 9-inch thick fine sandy loam horizon was underlain by a very dark gray (N 3/-) loamy sand with 10 percent dark yellowish brown (10YR 3/6) redoximorphic concentrations in the matrix. This soil does not meet any of the standard hydric soil criteria. However, Site K-1 is located on a

concave surface in an area where up to 12 inches of ponded water was observed. Several primary indicators of wetland hydrology were also observed, including a high water table and saturation within 12 inches of the soil surface. The presence of cattail and brooklime, both obligate species, further indicate prolonged inundation (14 or more consecutive days during the growing season). Based on this information, HDR scientists concluded that this soil qualifies as a hydric soil (Problematic Soils, Section 4e).

Soils at Site K-4 also included a very dark brownish dark grayish brown (10YR 3/2) fine sandy loam with 5 percent strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix. The sandy loam was underlain by a dark gray (10YR 4/1) loamy sand with 20 percent strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix. This soil meets the Redox Dark Surface (F6) criteria for hydric soils.

Hydrology

Indicators of wetland hydrology in Wetland K include Surface Water (A1), a High Water Table (A2), and Saturation (A3). Ponded water up to 12 inches deep was observed in the deepest part of the wetland area. Saturation was present at the soil surface at Site K-1. At Site K-4, saturation was present 9 inches below the soil surface and a water table was observed at 12 inches below the soil surface. These meet the criteria for wetland hydrology criterion.

Wetland Rating

Wetland K is rated Category IV in the Ecology rating system (Hruby 2004, Table 3). Wetland K scored very low for water quality functions (4/32 points), very low for hydrologic functions (6/32 points), and low for habitat functions (10/36 points) for an overall total of 20 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The low habitat score reflects the presence of only one type of vegetation structure (emergent), low interspersion of habitats, and moderate plant species richness. Wetland K does, however, have thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying and the wetland is located within 330 feet of one priority habitat, Coastal Nearshore (WDFW 2008).

The low water quality function reflects the lack of a constricted outlet, the lack of clay or organic soil layers, small seasonally ponded area, and low percentage of persistent, ungrazed, emergent vegetation. Wetland K does, however, have the opportunity to improve water quality. Hydrologic function in Wetland K is limited due to the presence of an unrestricted surface outlet and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires a 50-foot-wide buffer for Category IV wetlands with high-intensity land use. However, no buffer is present for Wetland F because the wetland is entirely bounded by access roads and active log yards.

6.2.5 Wetland L

Size in Study Area: 0.03 acres / **Overall Size:** 0.03 acres

NWI Code: Palustrine persistent emergent wetland (PEM1) with inclusions of un-vegetated open water with an unconsolidated bottom (PUB).

HGM Class: Depressional

Wetland Rating: Category IV

Description

Wetland L is a vegetated, excavated drainage ditch that conveys surface runoff from the log yard and chipping facility towards Grays Harbor. Water movement is from north to south with water draining from Wetland L to Grays Harbor through a storm drain. During the field investigation, HDR scientists noted that Wetland L did not display gravel or large wood habitat elements typically associated with streams and fish habitat.

Wetland L drains to Grays Harbor via a vertical drop culvert and then it flows through rip rap at the shoreline. The drain outlet precludes any fish access to this wetland from Grays Harbor. Wetland L would likely be regulated by both the USACE and the State of Washington as it meets wetland criteria and discharges to Grays Harbor.

Vegetation

Vegetation within Wetland L is dominated by reed canary grass and lamp rush. The presence of these species meets the wetland vegetation criteria. The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed in Wetland L consisted a very dark brown (10YR 2/2) loam underlain by a dark grayish brown (10YR 4/2) loamy sand starting at 9 inches below the soil surface. The loamy sand layer included 20 percent strong brown (7.5YR 4/6) redoximorphic concentrations in the matrix. This soil meets the Depleted Below Dark Surface (A11) criteria for hydric soils.

Hydrology

The water table was observed within 9 inches of the soil surface in Wetland L. Saturation was observed within 5 inches of the soil surface. Approximately 12 inches of ponded water was present approximately 5 feet from the soil sampling site. These meet the criteria for the Surface Water (A1); High Water Table (A2) and Saturation (A3) wetland hydrology criterion.

Wetland Rating

Wetland L is rated Category IV in the Ecology rating system (Hruby 2004, Table 3). Wetland L scored very low for water quality functions (4/32 points), very low for hydrologic functions (3/32

points), and very low for habitat functions (8/36 points) for an overall total of 15 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The low habitat score reflects the presence of only one type of vegetation structure (emergent), low interspersion of habitats, and low plant species richness. Wetland L does, however, have two types of water regimes present, one special habitat feature (thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying) and the wetland is located within 330 feet of one priority habitat, Coastal Nearshore (WDFW 2008).

The low water quality function reflects the lack of a constricted outlet, the lack of clay or organic soil layers, small seasonally ponded area, and low percentage of persistent, ungrazed, emergent vegetation. Wetland L does, however, have the opportunity to improve water quality. Hydrologic function in Wetland L is limited due to the presence of an unrestricted surface outlet, low depth of water storage during wet periods, and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires a 50-foot-wide buffer for Category IV wetlands with high-intensity land use. However, existing access rods cut off the buffer on the north, east, and west sides of the buffer. The southern portion of the wetland buffer consists of mowed grasses.

6.2.6 Wetland M

Size in Study Area: 0.34 acres / **Overall Size:** 0.34 acres

NWI Code: Regularly-flooded, intertidal estuarine wetland with persistent emergent vegetation (E2EM1N).

HGM Class: Tidal

Wetland Rating: Category II

Description

Wetland M is a saline, tidally influenced, persistent emergent estuarine wetland located in the low-lying areas along the east side of Paulson Road and the south side of the PSAP mainline track fill embankment in the northwest corner of the study area (Figure 2). Wetland M is located adjacent to and has a surface water connection with Wetland B. Wetland M was evaluated separately, however, because of its differing water regime (saltwater tidal) and because it represents less than 10 percent of the overall Wetland B assessment unit area based on GIS analysis. Wetland M also has a surface water connection to wetland and waterbody areas within the Refuge. Based on this surface water connection, it would likely be regulated by both the USACE and the State of Washington.

Wetland M has bi-directional flow of saline or brackish water to and from the Refuge via a culvert under Paulson Road. The Paulson Road drainage culvert is above the low tide elevation

so that at low tide there is a slight drop between the culvert and the stream channel in the Refuge, creating a small (less than 1 foot high) waterfall at the west entrance to the culvert. At high tide, water equalizes between Wetland M and the Refuge with saline or brackish water flowing back through the culvert and into Wetland M. A March 2014 fish survey confirmed the presence of coho and chum salmon throughout Wetland M (HDR 2014). Vegetation within Wetland M is dominated by the salt tolerant Lyngbye's sedge.

Wetland Rating

Wetland M is rated Category II in the Ecology rating system (Hruby 2004, Table 3). As an estuarine wetland, it is categorized using the Special Characteristics section of the rating system. Characteristics influencing its rating included its smaller size (less than 1 acre) and visible evidence of past disturbance. In addition, the wetland area does not meet the criteria for classification as a Natural Heritage Wetland, a bog, forested wetland, or coastal lagoon, which would result in a higher rating. Based on these observations, Wetland M was rated as a Category II wetland.

Buffer Width

Where high-intensity land use is proposed, the City of Hoquiam requires a 150-foot buffer on Category II estuarine wetlands. Because Wetland M is surrounded by Wetland B, the buffer of Wetland M overlaps with the Wetland B buffer. As a result, the Wetland M buffer is accounted for in the Wetland B buffer.

6.2.7 Wetland WW2

Size in Study Area: 0.16 acres / **Overall Size:** 0.18 acres

NWI Code: Palustrine broad-leaved deciduous forested wetland (PFO1) with inclusions of palustrine persistent emergent wetland (PEM1)

HGM Class: Depressional

Wetland Rating: Category III

Description

Wetland WW2 is a vegetated, roadside ditch located parallel to SR 109. HDR scientists observed surface water ponded within the depression but noted that Wetland WW2 does not have a surface outlet. However, Wetland WW2 is located adjacent to wetland areas within the Refuge (See Wetland NWR in Section 6.3.4, below), separated only by the railroad embankment berm. As a result, Wetland WW2 would likely be regulated by both the USACE and the State of Washington.

Vegetation

Vegetation within Wetland WW2 is dominated by red alder, Pacific water-dropwort and slough sedge. Reed canary grass and pale-yellow iris (*Iris pseudacorus*; OBL) are also present but not dominant. The presence of these species meets the wetland vegetation criteria.

Soils

Soils observed at Site WW2 consist of dark gray (10YR 4/1) soil twelve inches in thickness underlain by gravel fill. This soil does not meet any of the standard hydric soil criteria. However, Site WW2 is located on a concave surface in an area where up to 12 inches of ponded water was observed. Several primary indicators of wetland hydrology were also observed, including a high water table and saturation within 12 inches of the soil surface. The presence of multiple obligate species, including pacific water-dropwort, slough sedge, and pale-yellow iris further indicate prolonged inundation (14 or more consecutive days during the growing season). Based on this information, HDR scientists concluded that this soil qualifies as a hydric soil (Problematic Soils, Section 4e).

Hydrology

Indicators of wetland hydrology in Wetland WW2 include Surface Water (A1), a High Water Table (A2), and Saturation (A3). Ponded water up to 12 inches deep was observed in the deepest part of the wetland area. Saturation and the water table were observed at the soil surface at Site WW2. These meet the criteria for wetland hydrology criterion.

Wetland Rating

Wetland WW2 is rated Category III in the Ecology rating system (Hruby 2004, Table 3). Wetland WW2 scored moderate for water quality functions (20/32 points), low for hydrologic functions (9/32 points), and moderate for habitat functions (16/36 points) for a total of 45 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The moderate habitat score reflects the presence of three vegetation structures (emergent, forested, and forested with three strata), low interspersion of habitats, and moderate plant species richness. Wetland WW2 has thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying and cover of invasive species is less than 25 percent. The wetland is located within 330 feet of two priority habitats, a biodiversity area/corridor and riparian area (WDFW 2008).

The water quality function scored moderate. Characteristics that increased the score were the wetland is located in a closed depression with no outlet, the percentage of ungrazed, emergent vegetation was greater than 95 percent, as well as the opportunity to improve water quality. Characteristics that prevented the wetland from scoring higher include the lack of a clay or organic layer and a moderate area that is seasonally ponded. Hydrologic function in Wetland

WW2 is limited due to a low depth of water storage during wet periods and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires an 80-foot-wide buffer for Category III wetlands that receive less than 20 habitat points with high-intensity land use. SR 109 cuts off the buffer on the north side, and the south side buffer overlaps with the Wetland NWR buffer, which is rated higher than Wetland WW2. As a result, the buffer for Wetland WW2 is accounted for the Wetland NWR buffer.

6.2.8 Wetland WW3

Size in Study Area: 0.10 acres / **Overall Size:** 0.13 acres
NWI Code: Palustrine broad-leaved deciduous forested wetland (PFO1)
HGM Class: Depressional
Wetland Rating: Category III

Description

Wetland WW3 is a vegetated, roadside ditch located parallel to SR 109. HDR scientists observed surface water ponded within the depression but noted that Wetland WW3 does not have a surface outlet. However, Wetland WW3 is located adjacent to wetland areas within the Refuge (See Wetland NWR in Section 6.3.4, below), separated only by the railroad embankment berm. As a result, Wetland WW3 would likely be regulated by both the USACE and the State of Washington. Vegetation in the wetland area is dominated by red alder. Coastal willow, slough sedge, and lady fern (*Athyrium filix-femina*; FAC) were also present.

Wetland Rating

Wetland WW3 is rated Category III in the Ecology rating system (Hruby 2004, Table 3). Wetland WW3 scored moderate for water quality functions (16/32 points), low for hydrologic functions (9/32 points), and moderate for habitat functions (14/36 points) for a total of 39 out of 100 points (see Grays Harbor Rail Terminal LLC Wetlands Technical Report (HDR 2014a)).

The moderate habitat score reflects the presence of two vegetation structures (forested and forested with three strata), no interspersion of habitats, only one type of water regime present, and moderate plant species richness. Wetland WW3 has thin-stemmed persistent vegetation that could serve as structures for amphibian egg-laying, cover of invasive species is less than 25 percent, and large downed woody debris. The wetland is located within 330 feet of two priority habitats, a biodiversity area/corridor and riparian area (WDFW 2008).

The water quality function scored moderate. Characteristics that increased the score were the wetland is located in a closed depression with no outlet, the percentage of ungrazed, emergent vegetation was greater than 95 percent, as well as the opportunity to improve water quality.

Characteristics that prevented the wetland from scoring higher include the lack of a clay or an organic layer and a small area that is seasonally ponded. Hydrologic function in Wetland WW3 is limited due to a low depth of water storage during wet periods and the lack of opportunity to reduce flooding and erosion.

Buffer Width

The City of Hoquiam requires an 80-foot-wide buffer for Category III wetlands that receive less than 20 habitat points with high-intensity land use. SR 109 cuts off the buffer on the north side, and the south side buffer overlaps with the Wetland NWR buffer, which is rated higher than Wetland WW3. As a result, the buffer for Wetland WW3 is accounted for the Wetland NWR buffer.

6.3 Wetlands Adjacent to Study Area

In addition to the eight wetland areas described above, HDR scientists also identified four additional wetland areas located in the vicinity of the study area. These wetland areas were identified in the field and in some cases rated using the Ecology rating system, but were later determined to be located outside of the study area as a result of project refinements to avoid and minimize wetland impacts. The four wetland areas located outside of but adjacent to the study area are discussed briefly below to provide additional context.

6.3.1 Salt Marsh Wetland (Wetland SM)

Wetland SM is a flat, regularly-flooded, intertidal estuarine wetland with persistent emergent vegetation (E2EM1N), predominantly chairmaker's club-rush (*Schoenoplectus americanus*; OBL). It is tidally influenced and is located below MHHW along the edge of Grays Harbor and located over 200 feet east of the of the project area. Waterfowl, mostly mallards and American widgeon, were observed using the intertidal shoreline areas. Based on its location below MHHW and adjacent to Grays Harbor, it would likely be regulated by both the USACE and the State of Washington.

Based on rating forms completed in the field, Wetland SM is rated as a Category I wetland in the Ecology rating system (Hruby 2004, Table 3). As an Estuarine wetland, it is categorized using the Special Characteristics section of the rating system. The wetland area is relatively undisturbed, greater than one acre in size, and has both tidal channels and depressions with open water. Based on these features, Wetland SM was categorized as a Category I wetland. The City of Hoquiam requires a 200-foot buffer for Category I estuary wetlands.

6.3.2 Wetland A

Wetland A is a depressional, broad-leaved deciduous forested wetland (PFO1) with inclusions of broad-leaved scrub-shrub wetlands (PSS1) and broad-leaved scrub-shrub and emergent wetlands (PSS1/EM1). Wetland A is located east of the study area between the existing PSAP

mainline track embankment to the north and east of fill areas comprising the existing lumber storage yard to the south and west (Figure 2). Water in Wetland A generally drains to the north in a series of swales to the edge of the PSAP track fill embankment and then along the embankment westward towards Wetland B.

Vegetation in Wetland A is dominated by red alder in the tree stratum; salmon raspberry (*Rubus spectabilis*; FAC) and oso berry (*Oemleria cerasiformis*; FACU) in the shrub stratum, Himalayan blackberry in the vine stratum, and reed canary grass, slough sedge, Pacific water-dropwort, and yellow skunk cabbage (*Lysichiton americanus*; OBL) in the herb stratum.

Based on rating forms completed in the field, Wetland A is rated Category II in the Ecology rating system (Hruby 2004, Table 3). It scores as high for water quality functions (24/32 points), moderate for habitat functions (22/36 points), and very low for hydrologic functions (8/32 points) for an overall score of 54 out of 100. The City of Hoquiam requires a 150-foot buffer for Category II wetlands with moderate level of habitat function. However, the existing railroad track cuts off the buffer on the west side, leaving a buffer that is generally 50 to 100 feet wide. The western buffers adjoining Wetland A mainly consists of red alder, Himalayan blackberry, salmon raspberry, and sword fern.

6.3.3 Wetland J

Wetland J is a vegetated, excavated drainage ditch that conveys runoff from the roadside and from the log yard and chipping facility. Water movement is generally from the north to the south along the east side of Paulson Road. Wetland J is similar in nature to Wetland I but conveys water in the opposite direction, south, though a culvert under the intersection of Paulson, Moon Island, and Airport Way roads (Figures 2 and 3). The seaward side of the culvert drains into Grays Harbor through large rip rap boulders on the shoreline.

Field notes document that the Wetland J is similar in character to Wetland I. Vegetation in Wetland J is dominated by reed canary grass, lamp rush, and broad-leaf cattail with patches of shrub species including coastal willow and Himalayan blackberry. HDR scientists also observed ponded surface water within the wetland area, but noted that water within the wetland had very high turbidity and was slate gray in color. Wetland J does not display gravel or large wood habitat elements typically associated with streams. No tide gates were observed at the site, and the drain and rip rap boulders covering the culvert exit preclude any fish access to this wetland from Grays Harbor.

Wetland J is rated Category IV in the Ecology rating system (Hruby 2004, Table 3). Wetland J scored moderate for water quality functions (12/32 points), very low for hydrologic functions (5/32 points), and low for habitat functions (11/36 points) for an overall total of 28 out of 100 points. The City of Hoquiam requires a 50-foot-wide buffer for Category IV wetlands with high-intensity land use. However, there are no buffers for Wetland J because the wetland is bounded by Airport Way to the west and south, access road to the east, and existing fill materials consisting of quarry spalls to the north.

6.3.4 Wetland NWR

Wetland NWR is located south of western-most portion of the study area. It borders and is hydrologically connected to wetland areas within the Refuge. Wetlands adjacent to the study area are primarily palustrine broad-leaved scrub-shrub/persistent emergent (PSS1/EM1) dominated by coastal willow, red alder, salmon raspberry, black twinberry (*Lonicera involucrata*) and reed canarygrass. The scrub-shrub area represents a freshwater fringe of a larger, tidally-influenced, saline wetland area dominated by high salt marsh vegetation [intertidal scrub-shrub and persistent emergent estuarine wetland (E2SS1/EM1)]. Species in the salt marsh wetland include Lyngby's sedge, Pacific silverweed (*Potentilla palustris*), and tufted hairgrass (*Deschampsia caespitosa*). Based on this wetland area's location adjacent to Grays Harbor, it would likely be regulated by both the USACE and the State of Washington. No wetland rating form was completed in the field for Wetland NWR; however, this wetland is likely rated as a Category I wetland requiring a 200-foot wide buffer. However, no buffer is present on the west side of Wetland NWR within the study area because the wetland extends all the way to Paulson Road. On the north side, SR 109 cuts off the buffer, leaving a buffer that is generally less than 90 feet wide. The north side of the buffer adjoining Wetland NWR is dominated by red alder, salmon raspberry, red elder (*Sambucus racemosa*), sword fern, and California dewberry (*Rubus ursinus*).

6.4 Fish and Wildlife Habitat Conservation Areas

6.4.1 Waterbodies

The study area is located in the Grays Harbor Estuary sub-basin in the lower Chehalis Watershed (Water Resource Inventory Area [WRIA] 22). Waterbodies identified in the study area include Grays Harbor and one stream referred as the North Channel.

Grays Harbor

Grays Harbor is a large estuary of the Chehalis, Hoquiam, Humptulips, Wishkah, Johns, and Elk Rivers. The harbor is approximately 17 miles long and 12 miles wide. During a high tide, marine waters cover about 97 square miles in the harbor (Smith and Wenger 2001). The Chehalis River Basin drains about 2,200 square miles, making it the second largest river basin in Washington State, and includes portions of Lewis and Thurston Counties, limited areas of Pacific, Cowlitz, Mason, Wahkiakum and Jefferson Counties, and most of Grays Harbor County (Smith and Wenger 2001). The mean annual discharge from the Chehalis River and all its tributaries is estimated at 14,000 cubic feet per second. Peak discharges occur during winter following storm events rather than from snowmelt.

Forage fish within Grays Harbor are important because they are the prey base of a variety of piscivorous species. At least seven species of forage fish are known to occur in Grays Harbor: Pacific herring (*Clupea harengus pallasi*), Pacific sand lance (*Ammodytes hexapterus*), northern anchovy (*Engraulis mordax*), surf smelt (*Hypomesus pretiosus*), longfin smelt (*Spirinchus*

thaleichthys), whitebait smelt (*Allosmerus elongatus*), and American shad (*Alosa sapidissima*) (USACE 2006a). Surf smelt are the most common species in the lower estuary, while longfin smelt appear to be restricted to the upper reaches of the estuary.

The shoreline habitat adjacent to and within the study area consists of heavily armored banks interspersed with some upland vegetation, with a heavy concentration of large woody debris/logs. Shorelines adjacent to the Terminal pier are composed of asphalt, concrete or boulder riprap, which is partially submerged during higher tides. The intertidal habitat within the project area includes an open-water shoreline with sand and mud flats. Sediment composition in the intertidal zone ranges between silty sand with some gravel to silt with clay. Gravel is the substantial component of the silty sand near the shoreline.

Both native eelgrass (*Zostera marina*) and introduced Japanese eelgrass (*Zostera japonica*) occur in Grays Harbor. The native eelgrass requires light and relatively stable unconsolidated substrata for growth. These conditions are very limited in the inner portion of Grays Harbor, particularly the east end, because of the water's high turbidity and continuous settlement of fine silt (Borde et al. 2003). The distribution of eelgrass is limited by salinity, which tends to be very low during the winter in the eastern portion of Grays Harbor. Japanese eelgrass is present in some portions of Grays Harbor, commonly at higher intertidal elevations than the native eelgrass. Japanese eelgrass is limited to the middle to lower intertidal zone (Harrison 1982), generally higher than the native eelgrass that grows from the lower intertidal zone to shallow subtidal depths. The shoreline and intertidal habitat is described in greater detail in the Grays Harbor Rail Terminal LLC Intertidal Technical Report (HDR 2014c). Photographs are provided in Appendix A.

Eelgrass observed in the intertidal silty sand zones within the project area includes Japanese eelgrass (*Zostera japonica*) and brown algae, aka rockweed (*Fucus distichus*). Japanese eelgrass was observed in small clumps, relatively evenly distributed, growing in the silty sand. These patches did not form contiguous eelgrass beds in the study area. Brown algae was observed growing on old pilings, rocks, etc. As substrate transitioned to mud, no marine grasses or macroalgae were observed.

6.4.2 Streams

One stream is located in the study area known as the North Drainage Channel (named for the purposes of this report). A description of the North Drainage Channel is provided below and in more detail in the Grays Harbor Rail Terminal LLC Fish Habitat Technical Report (HDR 2014b). No other streams were identified within the project area.

The majority of the surface water at the site drains northward into the North Drainage Channel that runs along the north side of the property. This North Drainage Channel is a fairly uniform grassy ditch about 10 to 15 feet wide and 2 to 3 feet in depth at the western end and gradually becomes narrower and shallower towards the east end of the project area. This channel flows east to west along the south side of the railroad embankment and through a 5 foot diameter

cement culvert passing under Paulson Road where it continues westward through the Grays Harbor National Wildlife Refuge to empty into the Grays Harbor. During low tide, there was an almost 1 foot drop between the culvert exit on the west side of Paulson Road and the stream channel in the wildlife refuge. This was only observed at low tide during relatively low flows in May. During subsequent field visits in February and March, at low tide the culvert exit remained submerged. The culvert then only occasionally would pose a barrier to juvenile salmon passage upstream from the wildlife refuge during periods of low flows and lower low tides.

The substrate is mainly composed of fine material and organics, with some embedded gravels in a few locations. The water was very turbid at the time of field investigations and thus the substrate was not readily visible. Water depths were measured from around 2 to 3 feet in the western portion of the channel downstream of the forested area. The stream then becomes shallower to where it is less than a foot deep to the east of the rail line spur. The majority of the riparian vegetation along the channel is nonnative upland vegetation such as Himalayan blackberry, reed canarygrass, and Japanese knotweed. The channel conveys water draining north from the site through an approximately 5 foot diameter cement culvert under Paulson Road into a channel that traverses the wildlife refuge and enters into Grays Harbor. The western (downstream) end of the channel within about 1 to 650 feet east of Paulson Road is tidally influenced.

The North Channel within the study area is rated as a fish-bearing stream (Type F) per the City of Hoquiam Municipal Code (HMC 11.06.010), requiring a 150-foot buffer. However, the existing railroad track cuts off the north side of the buffer, leaving a buffer that is generally less than 20 feet wide. This area is entirely within Wetland B; therefore, no stream buffer is present on the north side of the North Channel. The vegetated buffer on the south side is entirely within Wetland B and the Wetland B buffer. As a result, the North Channel stream buffer is accounted for in the Wetland B buffer. Table 5 summarizes the size, rating, and classification of the North Channel in the study area, and Figure 2 shows the location of the North Channel. Photographs of the stream are provided in Appendix A.

Table 5. Summary of Streams within the Project Area the Water

Stream	Tributary to	Local Rating[a]	Average Bankfull Width (ft)	Average Depth (ft)	Buffer Width
North Drainage Channel	Grays Harbor	F	10-15	2-3	150

[a]HMC 11.06.010

6.4.3 Federally Endangered and Threatened Species

Federally threatened species identified to potentially occur in Grays Harbor County include bull trout (*Salvelinus conflutentus*), marbled murrelet (*Brachyramphus marmoratus*), northern

spotted owl (*Strix occidentalis caurina*), Oregon silverspot butterfly (*Speyeria zerene hippolyta*), and Western snowy plover (*Charadrius alexandrinus nivosus*) (USFWS 2013). Critical habitat for bull trout, marbled murrelet, northern spotted owl and western snowy plover is designated in Grays Harbor County. In addition, green sturgeon (*Acipenser medirostris*), green sturgeon critical habitat and Pacific eulachon (*Thaleichthys pacifi*cus) are federally listed by the National Marine Fisheries Service (NMFS 2012).

Many fish species use Grays Harbor for migration, rearing, and foraging. Federally listed bull trout (generally subadults), green sturgeon (subadult and adult life stages), and Pacific eulachon (larvae and adult forms) are known to use Grays Harbor for foraging and migration. No federally threatened fish species are documented to occur in the North Drainage Channel (WDFW 2014a, WDFW 2014b).

Bull Trout

Bull trout spawn in the fall after water temperatures drop below 48°F, in streams with cold, unpolluted water, clean gravel and cobble substrate, and gentle stream slopes. The eggs incubate for four to five months, hatching in late winter or early spring. Some bull trout may live near areas where they were hatched, while others may migrate to lakes, reservoirs, or salt water. Anadromous bull trout sub-adults move downstream in April through June, and adults migrate from the marine environment to freshwater spawning grounds during May, June and July (Kraemer 1994). Bull trout are likely to occur within the study area near Terminal 3. Bull trout may migrate past the project area while they are foraging in the marine environment before returning to streams to spawn. A native char utilization study (USACE 2006b) documented occurrences of bull trout in the Lower Chehalis/ Grays Harbor area. No bull trout populations have been identified to ascend or spawn in the tributaries of Grays Harbor; therefore, rearing juvenile bull trout are not present in the North Drainage Channel. In addition, the habitat conditions of the North Channel are not optimal for spawning bull trout.

Green Sturgeon

Green sturgeon may be present in the project area, possibly using Grays Harbor estuarine habitat as forage areas during the summer. However, the portion of the Grays Harbor estuary within which Terminal 3 is located is not likely optimal habitat for foraging green sturgeon. The Terminal berth is dredged, resulting in on-going disturbance to existing substrate. Further, the area is likely lower in salinity than optimal foraging habitat, considering the freshwater inputs of two upstream tributaries including Fry Creek and the Hoquiam River. However, green sturgeon may migrate past the Terminal and therefore their potential presence in the vicinity of Terminal 3 cannot be discounted. Green sturgeon is not documented to occur in the North Drainage Channel. This is likely due to the low salinity of the stream, the lack of preferred prey items, and the distance of the project area from the outer harbor.

Pacific Eulachon

After spending 3 to 5 years in the ocean, adult eulachon return to freshwater in the lower reaches of rivers to spawn. Eulachon could be in the project area near Terminal 3 using the estuarine habitat as forage before migrating to nearby rivers such as the Hoquiam River. Eulachon typically utilize estuarine environments during their juvenile life stage (8 weeks to 12 months) (Cambria Gordon 2006) or when waiting to spawn. Pacific eulachon are not documented to occur in the North Drainage Channel. It is unlikely to find eulachon in small streams as they typically utilize the lower reaches of large rivers and estuaries to spawn. In addition, eulachon are unlikely to inhabit the North Channel due to the poor habitat quality and presence of fine substrate material which is not conducive to spawning activities and high salinity. Pacific eulachon eggs are unable to survive salinities above 16 parts per thousand (ppt) (Wilson et al. 2006).

Other Federally Threatened Species

Due to the industrial nature of the site and lack of suitable habitat, other federally threatened species such as the marbled murrelet, northern spotted owl, Oregon silverspot butterfly and western snowy plover are not documented or expected to occur within the project area. Critical habitat for marbled murrelet, northern spotted owl and western snowy plover is not present in the project area.

Other Sensitive Species

WDFW (2014a) Priority Habitats and Species maps show the occurrence of peregrine falcon (*Falco peregrinus*), a federally sensitive species, wintering in the Refuge adjacent to the project area. Though there were no peregrine falcon nests observed within the project area it is likely that they use the area for foraging.

6.4.4 Salmonid Species

Chinook, coho and chum salmon are documented to occur in the Grays Harbor estuary (WDFW 2014b). Salmonid species that spawn in the rivers and streams of the Chehalis basin all must pass through the nearshore habitats in the Grays Harbor estuary as they migrate to and from the ocean. Estuarine environments are extremely productive, rich habitats, and many life histories of juvenile salmon spend extended periods of time rearing in this environment. No salmonid species are documented to occur within the North Drainage Channel in the project area (WDFW 2014a, 2014b). However, a fish sampling study conducted on May 9 and 10, 2012 and March 10, 2014 using backpack electro-shock techniques identified the presence of juvenile chinook, coho and chum salmon in the North Drainage Channel. In total, 20 juvenile coho, and 4 juvenile Chinook were found in 2012. All but 3 of the juvenile coho were of similar size, suggesting that they were all from the same cohort. The remaining 3 coho were fry of about 30 to 40mm in length. Parr marks were still visible on most of the coho and all of the chinook that were sampled indicate that these fish were inhabiting the channel while undergoing

smoltification in order to complete their migration to salt water. In March 2014, 24 juvenile coho and 2 juvenile chum salmon were sampled and of similar size (between 80 and 110 mm) and still retained parr marks, indicating they were in the pre-smolt stage. These fish species observed within the North Drainage Channel are not federally-listed or state-listed endangered and threatened species.

6.4.5 Species of Local Importance

As of the writing of this document, the City of Hoquiam has not designated or approved any Species of Local Importance 2014.

6.5 Geologic Hazard Areas

Three criteria of geologically hazardous areas were assessed: erosion hazards, landslide hazards, and seismic hazards. According to the USDA NRCS soil data, soils within the study area are rated as slight potential for erosion hazard indicating that erosion is unlikely to occur under ordinary climatic conditions (USDA NRCS 2014). No landslide hazard areas are identified within the study area based on the soil survey maps and topographic survey data, and the risk of landsliding within the study area is considered low because of the flat site topography. Although the study area is located near the tidally influenced Grays Harbor estuary, no undercutting by wave action was observed within the study area.

Seismic hazard areas are present within the study area based on the presence of soils that are potentially susceptible to liquefaction. Liquefaction refers to a condition where vibration or shaking of the ground, usually from earthquake forces, results in the development of excess pore pressures in saturated soils and subsequent loss of strength. This can result in vertical oscillations and/or lateral spreading of the affected soils with accompanying surface subsidence and/or heaving. In general, soils, which are susceptible to liquefaction, include loose to medium dense clean to silty sands which are saturated (i.e., below the water table). Within the study area, soils that contain layers of silty sand and sandy silt (Alluvium deposits), located about 40 to 110 feet deep, are susceptible to liquefaction.

The proposed project is also located in a moderately active seismic region. Historically, the region has experienced moderate to large earthquakes, and geologic evidence suggests that larger earthquakes have occurred in the prehistoric past and will occur in the future. The nearest mapped fault in the U.S. Geological Survey is a northeast trace of the Saddle Hill Fault Zone consisting of short, discontinuous traces that trend northeast-southwest for a distance of approximately 16 miles. The study area is located approximately 10 miles southeast of the most northeastern trace. Evidence of Holocene rupture has not been reported along this trace of the Saddle Hill Fault Zone. As a result, the potential for fault rupture is considered low (Shannon and Wilson 2013).

6.6 Frequently Flooded Areas

The majority of the study area is classified by FEMA as a Zone C, which is defined as minimal risk areas outside of the 100- and 500-year floodplains. However, the northwestern portion of the study area is identified as a Zone V2 flood hazard (Figure 4). Zone V2 areas are located along coasts subject to inundation by the 100-year flood event with additional hazards associated with storm-induced waves.

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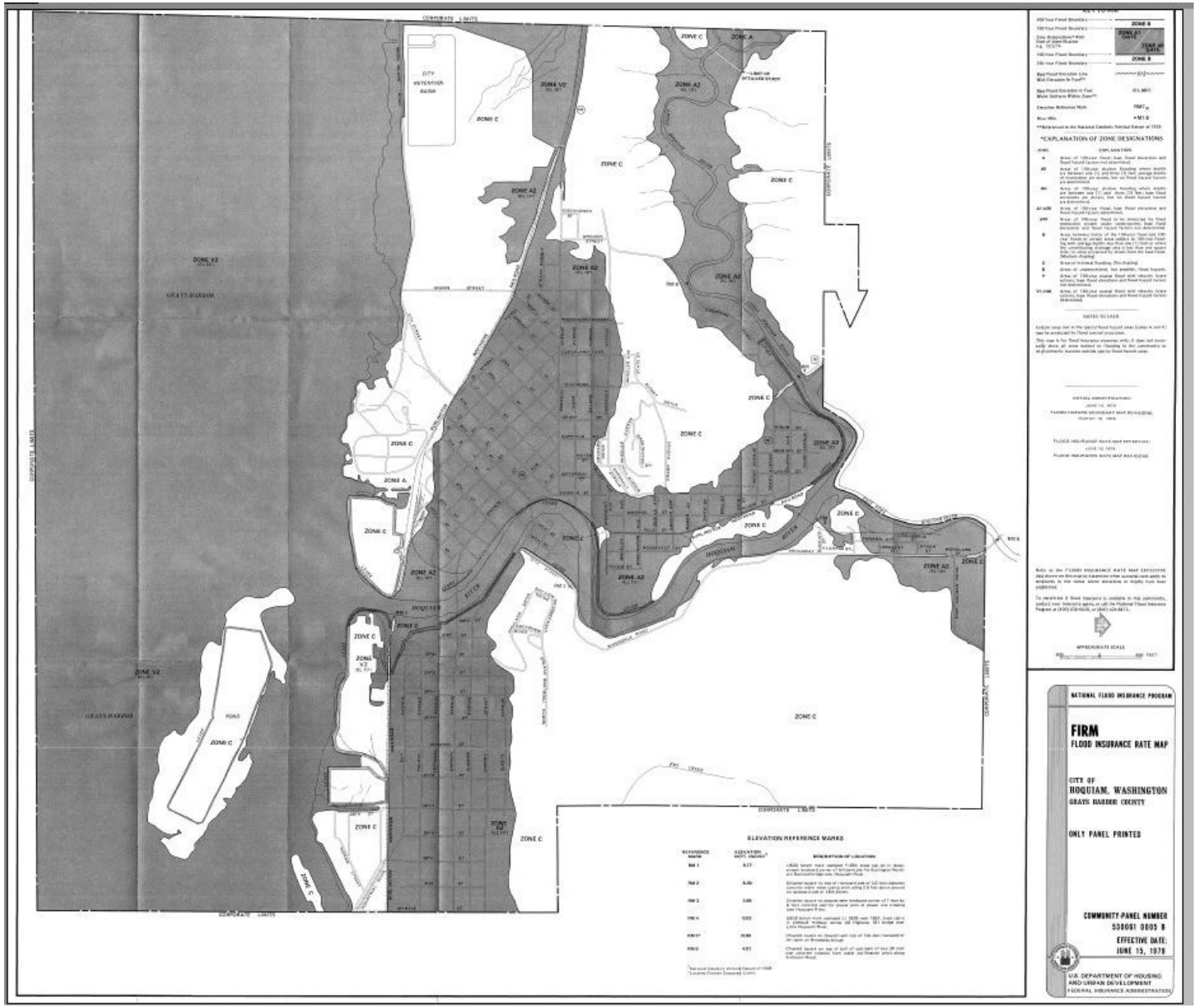
Figure 4. FIRM Map



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7 Project Effects

7.1 Wetland Impacts

7.1.1 Construction Impact

The Grays Harbor Rail Terminal Project would result in the permanent loss of 0.52 acres of the 5.94 acres of wetlands mapped within the study area (approximately nine percent). Table 6 below summarizes the acreage of permanent impacts to wetlands by project components. A plan view of the project components overlain on the wetland mapping is shown in Figures 2 and 3.

Table 6. Summary of Permanent Impacts to Wetlands in the Study Area

Project Component	Type of Impact	Wetland Name	Cowardin Class	Wetland Rating [a]	Permanent Impact (acres)
Rail Terminal	Fill	Wetland B	PEM1	Category III	0.25
Rail Terminal	Fill/Culvert	Wetland B	PEM1	Category III	0.18
Rail Terminal	Fill	Wetland M	E2EM1N	Category II	0.08
Tank Farm	Fill/Culvert	Wetland I	PEM1	Category IV	0.01
Total:					**0.52**

[a] Wetland ratings are based Washington State Wetland Rating System for Western Washington – Revised (Hruby 2004).

Project development would result in permanent impact to 0.08 acres of Category II wetlands, 0.43 acres of Category III wetlands, and 0.01 acres of Category IV wetlands, for a total of 0.52 acres.

The majority of the impacts would be due to construction of the rail terminal. Construction of the rail terminal would result in 0.52 acres of permanent impact to wetlands. Approximately 0.08 acres of impact would occur to Wetland M (ditched, saline, tidally influenced, persistent emergent estuarine wetland) from the placement of fill necessary to support the volume and weight of loaded rail cars. The presence of coho and chum salmon has been identified throughout Wetland. An additional 0.43 acres of impact would occur to Wetland B (palustrine, emergent wetland generally dominated by invasive species). The impacts to Wetland B would occur from the placement of fill for the rail terminal at the northwest portion of the wetland and installation of a culvert and structural fill in the far eastern portion of the wetland. The culvert would be installed within the wetland to maintain the existing stormwater drainage pattern provided by Wetland B through the constructed rail terminal.

The remaining 0.01 acres of impact would occur to Wetland I (palustine, emergent wetland dominated by invasive species) from construction of the tank farm. Wetland I is located in a ditch along Paulson Road and provides stormwater drainage from the road and the adjacent

industrial facility. The impact would result from the installation of a culvert within the wetland to provide access to the tank farm from Paulson Road.

Temporary impacts from construction have not been identified at this time but are anticipated to be minor. Much of the study area has been previously filled and existing areas of undisturbed native vegetation are minimal. Construction would occur during the dry summer months. Temporary erosion and sediment control measures will be implemented as practicable at individual locations to minimize short-term water quality impacts to wetlands. Disturbed areas will be replanted with vegetation appropriate to the site's hydrology, salinity, and habitat type following construction. All construction limits would be marked in the field and appropriate best management practices would be followed to prevent unpermitted impacts to wetlands. Wetland areas to be avoided during construction would be marked with orange construction fencing.

An above ground pipeline would be constructed from the tank farm to the shipping terminal to transport crude from the on-shore storage tanks to the shipping vessels. Construction access for the pipeline would be via an existing road that provides access from Airport Way into the log storage and wood chipping facility. Two wetlands, Wetlands K and L, are located on the east side of the access road leading to the log storage and wood chipping facility. No permanent or temporary impacts to these wetlands are planned at this time.

Approximately 0.67 acres of degraded wetland buffer will be permanently impacted by the proposed project. Permanent buffer impacts include clearing buffer vegetation and permanent filling of these areas from the construction of the rail terminal. The affected wetland buffers are primarily dominated by red alder, Himalayan blackberry, and Scotch broom.

7.1.2 Operational Impact

All wetland impacts would be anticipated to occur during the construction phase of the project. No impacts to wetlands are anticipated during the operational phase of the project.

Data Source: Wetland resource features - HDR ; Aerial - ESRI ArcGIS Online.
Map information was compiled from the best available public sources. HDR does not warrant that the information is accurate or complete.

New Mooring Dolphin
Culvert
MHHW
Project Area
Industrial Lead Track
Detention/Infill Pond, Tank Farm, Rail Car Unloading Tracks
Wetland within the project area
Approximate wetland boundary
Wetland Buffer
Wetlands Impact Area
Wetland Buffer Impact

0 100 200 400 Feet

Figure 5 Wetland and Buffer Impacts

Terminal 3 – Port of Grays Harbor, Hoquiam WA
US Development Group LLC

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7.2 Fish and Wildlife Habitat Conservation Area Impacts

This section describes anticipated construction and operational effects on the FWHCAs. A more detailed analysis on impacts to federally listed species will be addressed in a Biological Assessment as the project moves forward with more detailed design.

7.2.1 Construction Impact

7.2.1.1 Impacts to Grays Harbor Habitat

Construction activities that would generate temporary impacts to the nearshore environment of Grays Harbor include pile installation of four additional mooring dolphins at Terminal 3. Each dolphin includes 8 steel piles measuring 24 inches in diameter, for a total of 32 piles. The dolphins will displace 100 square feet of benthic habitat, and will eliminate benthic invertebrate production in these areas.

It is anticipated that a barge-mounted crane and work skiffs would be used during pile installation. Above MHHW, a crane, a vibratory hammer, and miscellaneous hand tools would be mounted from a barge. Use of an impact driver for proofing would be necessary to drive the final 10 to 15 feet for all piles. This work could result in increased sound pressure levels and water quality and turbidity impacts. The bottom substrates in Grays Harbor in the vicinity of Terminal 3 consist of sandy silts. The area affected by turbidity or water quality degradation is confined to the immediate project vicinity both upstream and downstream of each pile to be driven, given the potential for sediment plumes and movement due to the occurrence of currents within the harbor and tidal influence in the area.

The potential for injury and/or mortality of any aquatic organism from pile driving depends on the type and intensity of the sounds produced. These are greatly influenced by a variety of factors, including the type of hammer, the type of subsurface conditions and substrate, depth of water, and formations that may serve to naturally intercept and attenuate Sound Pressure Levels (SPL). Even in the absence of mortality, elevated noise levels can cause sub lethal injuries. Fish suffering damage to hearing organs may suffer equilibrium problems, and may have a reduced ability to detect predators and prey (Hastings and Popper 2005, Turnpenny et al. 1994). Adverse effects on survival and fitness may occur even in the absence of overt injury. Exposure to elevated noise levels may cause a temporary shift in hearing sensitivity, decreasing sensory capability for periods lasting from hours to days (Turnpenny et al. 1994). Popper et al. (2005) found temporary threshold shifts in hearing sensitivity after exposure to cumulative SELs as low as 184 dB. Temporary threshold shifts reduce the survival, growth, and reproduction of the affected fish by increasing the risk of predation and reducing foraging or spawning success.

Vibratory pile driving could potentially disturb migratory or foraging salmon and bull trout that may be present offshore in the project area. This acoustic effect could create a temporary barrier to use of habitat immediately adjacent to terminal during installation; however, by conducting work during the approved in-water work window, potential impacts would be

minimized. All in-water pile driving would occur during the WDFW in-water work window for the project (July 16 to October 14) during the construction season. Because the only elements of the proposed action requiring work below the MHHW line include piling installation, other elements of the action above MHHW may occur outside the in-water work window.

Overall, the project construction activity would have temporary effects through the presence of machinery and activities in and adjacent to bull trout and green sturgeon critical habitat (below MHHW). However, activities would result in no permanent destruction or adverse modification of critical habitat. No soil stabilization is anticipated to be necessary as the nature of the proposed action would not affect shorelines, banks or shoreline vegetation. Due to the developed nature of the site and the depths at which piles would be driven, no riparian vegetation is located in the proximity of proposed pile installation activities. Construction barges would be moored at sufficient depth so as to not ground out during low water conditions, so substrate should not be affected.

7.2.1.2 Impacts to Stream Habitat

Construction impacts would be temporary and limited to the period during and immediately following project construction. Aquatic resources in the North Drainage Channel and downstream in the wildlife refuge would be at risk during construction based on the amount of ground-disturbing activity in the vicinity of the drainage. The risk of construction-related impacts to water resources would be controlled by complying with the NPDES Construction Stormwater General Permit process and best management practices (BMPs), as appropriate. For aquatic species and habitat, earthwork and equipment associated with project construction could introduce sediment and contaminants (e.g., fuel or hydraulic fluids) to streams that could also be carried downstream to the wildlife refuge. The contractor would implement BMPs to prevent turbidity plumes downstream and pollutants from equipment and runoff during construction. Seasonal restrictions (i.e., work windows) would apply to work conducted below the ordinary high water mark.

A culvert would need to be constructed under the new rail lines that traverse the project property. Design and construction of the culvert under the new rail spur would comply with WAC 220-110-070 regarding fish passage requirements. Construction of this culvert would result in temporary impacts to the channel. Coffer dams would be required to isolate the construction reach, with a temporary bypass to divert the flow around the site of the construction and return it to the tidal channel downstream. After completion of construction activities, the channel outside the new culvert would be restored to pre-project conditions, with improvements to the riparian vegetation by planting of native plant species, and improvements to fish cover and habitat by adding some large woody debris.

7.2.2 Operational Impact

7.2.2.1 Impacts to Grays Harbor Habitat

Completion and operation of the project would result in a slight increase in vessel traffic of 3 to 4 more ships per month at the terminal. This could affect fish use of the navigation channel at and downstream of the Terminal with added disturbance. The frequency of these added ships is quite small, so the disturbance would be intermittent and minimal. The footprint of the Terminal 3 dolphins is immeasurable compared to the overall acreage of available habitat in Grays Harbor. No permanent adverse effects on ground fishes, coastal pelagics, Pacific salmonids, or their prey species would result from the proposed installation of additional dolphins at the project site. Added overwater structure from the new dolphins could provide additional perching areas for piscivorous birds resulting in a small increase in predation opportunities.

7.2.2.2 Impacts to Stream Habitat

The project would result in the loss of approximately 340 feet of a tidal channel where it would need to be piped through a culvert under the proposed rail lines. This culvert would be constructed to meet fish passage criteria, but would not provide tidal channel habitat and would result in the loss of that portion of the natural channel.

The project would alter the drainage patterns of the site and the flows within the channel and consequently the wildlife refuge channel downstream. A stormwater retention pond would be constructed to improve water quality of the runoff from the site, and the system would be designed to have no net loss of flow compared to pre project levels.

Improved water quality in the north drainage channel and downstream into the Refuge would result from the completion of the project, and the channel would likely become less turbid. From a water quality perspective this would be beneficial, but loss of turbidity could also affect fish cover in the channel. Turbid water can provide a refuge from piscivorous and avian predators (Simenstad 1982). Conversely, excessive turbidity can hamper foraging success by visual predators such as salmon. Overall, improved water quality by controlling runoff from the site would prove beneficial for fish habitat and the wildlife refuge by preventing excessive turbidity and harmful substances from entering the waters used by fish.

7.3 Geologic Hazard Areas

The proposed project is not anticipated to increase the risk of occurrence of geologically hazardous areas. The proposed facility will be designed in accordance with the International Building Code (IBC) 2012, and there would be no unsafe conditions to on-site and off-site property owners as a result of this project. A detailed construction techniques, recommendations, and technical specifications will be provided in the Geotechnical Report prepared by Shannon and Wilson (2013).

7.4 Frequently Flooded Areas

Construction of the proposed facility will comply with all applicable standards and provisions described in HMC 11.16.250 and 11.16.270. All design and construction methods will be in accordance with accepted standards of practice for meeting the provisions of the HMC based on their development and/or review of the structural design, specifications, and plans. As a result, construction of the project will not result in any increase in flood levels during the occurrence of the base flood discharge.

8 Mitigation

This section describes the proposed mitigation for impacts to critical areas affected by the project. It outlines impact avoidance and minimization (including BMPs), and describes mitigation goals, objectives, and performance standards as well as proposed monitoring and maintenance efforts at each mitigation site.

8.1 Mitigation Sequence

Federal, state, and City of Hoquiam regulations require that mitigation efforts follow this prescribed sequence:

1. Avoiding the impacts altogether by not taking a certain action or parts of an action,
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts,
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment,
4. Reducing or eliminating the impact over time by preservation and maintenance operations,
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.

8.1.1 Avoidance and Minimization

The proposed project has been designed to avoid or minimize impacts to wetlands, streams, and buffers wherever feasible. Project impacts will be minimized using the following measures:

- The project has been designed with a compact footprint in order to limit the overall extent of impacts to natural resources and species of local importance.
- The track layout has been configured to avoid impacts to Wetland A, a Category II wetland to the east.
- Construction impacts will be confined to the minimum area necessary to complete the project.

- Prior to beginning construction, high visibility fencing and silt fence will be installed to delineate the sensitive areas and to keep contractor personnel, equipment, and materials from entering the wetlands and streams.
- Project staging and material storage areas shall be located a minimum of 150 feet from surface waters or in currently developed areas.
- A Temporary Erosion and Sediment Control (TESC) Plan would be developed and implemented for all clearing, vegetation removal, grading, ditching, filling, embankment compaction, or excavation. The BMPs in the plans would be used to control sediments from all vegetation removal or ground disturbing activities.
- All equipment to be used for construction activities shall be cleaned and inspected prior to arriving at the project site to ensure no potentially hazardous materials are exposed, no leaks are present, and the equipment is functioning properly. Should a leak be detected on heavy equipment used for the project, the equipment shall be immediately removed from the area and repaired prior to use.
- The Contractor would designate at least one employee as the erosion and spill control (ESC) lead. The ESC lead would be responsible for the installation and monitoring of erosion control measures and maintaining spill containment and control equipment. The ESC lead would also be responsible for ensuring compliance with all local, state, and federal erosion and sediment control requirements.
- Material that may be temporarily stored for use in project activities shall be covered with plastic or other impervious material during rain events to prevent sediments from being washed from the storage area to surface waters.
- All temporary and permanent erosion and sedimentation control measures would be inspected on a regular basis, maintained, and repaired as necessary.
- Silt fences would be inspected after each rainfall, and at least daily during prolonged rainfall. Sediment would be removed as it collects behind the silt fences and prior to their final removal.
- Temporary storage of excavated materials would not occur within the 100-year floodplain between October 1 and May 1. Material used within 12 hours of deposition would not be considered temporary.
- Where practicable for soil stability, native vegetation would be planted in areas disturbed by construction activities.
- Exposed soils would be seeded and covered with straw mulch or an equally effective BMP after construction is complete. Any temporary construction impact areas where vegetation currently exists would be revegetated with native plants following final grading activities.
- All silt fencing and staking would be removed upon project completion.

- A concrete truck chute cleanout area or equally effective BMP shall be established to properly contain wet concrete.
- The Contractor shall prepare a SPCC Plan prior to construction. The SPCC Plan shall identify the appropriate spill containment materials, which would be available at the project site at all times.
- The contractor would develop a SPCC Plan, TESC Plan, and a Hydraulic Report for the Project. Additionally, the Contractor would keep a TESC inspection report and Site Log Book.
- All construction activities would comply with water quality standards set forth in the State of Washington Surface Water Quality Standards (WAC 173-201A).
- No paving would occur during periods of rain or wet weather.
- There will be no visible sheen from petroleum products in the receiving water as a result of project activities.
- No excavated material would be placed in the existing stream channels. Excavated material would be removed to a location that would prevent its reentry into waters of the State.
- To prevent potential entry of construction materials, fill for the existing trench, etc., into North Channel, weed-free straw matting and silt fencing would be staked just above the active flow of the creek.
- No machinery will operate within the active stream channel of North Channel.
- Oil, fuels, or chemicals will not be discharged to surface waters or onto land where there is a potential for reentry into surface waters.
- Oil absorption materials will be used adjacent to silt fencing at the North Channel location if any machinery will operate below the MHHWM of the creek.
- The proposed stormwater treatment bioswales are being designed to meet the minimum requirements for runoff treatment Best Management Practices in Volume V of the Stormwater Management Manual for Western Washington (Ecology 2012). The Manual provides technical guidance on measures to control the quantity and quality of stormwater runoff from new development and redevelopment projects. These measures are considered to be necessary to achieve compliance with State water quality standards and to contribute to the protection of the beneficial uses of the receiving waters (both surface and ground waters).

8.1.2 Compensatory Mitigation

Compensatory mitigation for unavoidable adverse impacts to wetlands and streams would be provided according to the replacement ratios for the affected wetland discussed above, based on the City of Hoquiam's requirements. Compensatory mitigation sites would be identified close

to the impacts to the extent possible and compensate for lost functions of the wetlands. The specific compensatory mitigation sites and designs will be determined during the final design and be prepared in a separate document.

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Appendix A: Photographs

Wetland B, looking west to Paulson Road.

Wetland B, soil pit WLB Plot 1.

Wetland B, eastern portion, looking south.

Wetland B, confluence with railroad ditch, looking north.

Wetland B, confluence with railroad ditch, looking south.

Wetland M, near Paulson Road, looking east.

Wetland M, near Paulson Road, looking south.

Wetland M, near Paulson Road, looking north.

Wetland F, looking south.

Wetland F, culvert discharge, looking northeast.

Wetland I, looking southwest.

Waterbody E, excavated linear pond, looking east.

Wetland K, looking north.

Wetland L, looking northeast.

Grays Harbor, unvegetated tidal zone.

Upland, filled log yard with stormwater discharge, looking southeast. Drains to Wetland F.

Upland, vegetation within Area C, looking north.

Upland, soil pit in Area C.

Upland, emergent vegetation within Area C, looking northeast.

Upland, soil pit in Area C.

Upland, emergent vegetation within Area D, looking south.

Upland, soil pit in Area D.

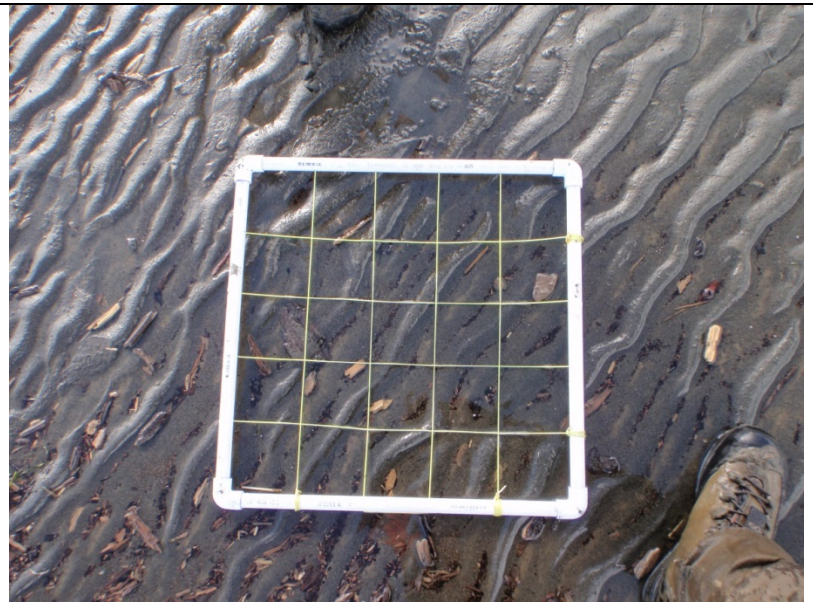
Downstream (western) end of the North Drainage Channel flowing towards the culvert under Paulson Road.

Culvert exit under west side of Paulson Road. The culvert becomes a hanging culvert at low flows and lower lower low tides.

Sand and mud flat under and adjacent to the Terminal 3 pier facing Souheast.

Sand and mud flat adjacent to the Terminal 3 pier; facing east.

Sand and mud flat, north of the terminal, and along Transect 4, facing south.



Typical quadrant sample with silty sand substrate and Z. Japonica.

Tidal channel and high marsh in the Rufuge, facing east.

Tidal channel and high marsh, facing southwest.