Vancouver Energy
Construction Stormwater Pollution Prevention Plan

Plan No. C.01 | Revision 01

Approved by:

Name, Title: Kelly Flint, Senior Vice President and Corporate Counsel, Savage Companies
Designated Agent for EFSEC Application No. 2013-01
Date: 4 August 2015

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Vancouver Energy
Construction Stormwater Pollution Prevention Plan

EFSEC Application for Site Certification No. 2013-01
Docket No. EF131590
4 August 2015

Prepared for

Tesoro Savage Petroleum Terminal LLC
5501 NW Old Lower River Road
Vancouver, Washington 98660

Prepared by

BergerABAM
210 East 13th Street, Suite 300
Vancouver, Washington 98660

Job No. A13.0267.02

Revision Summary

No.	Date	Edits/Comments
00	27 February 2015	Submittal for Application Review
01	4 August 2015	Response to EFSEC 23 June 2015 Construction Stormwater National Pollutant Discharge Elimination System (SW NPDES) Permit Application Review and Restrictive Covenant Review for Consent Decree

Vancouver Energy
Construction Stormwater Pollution Prevention Plan

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1. Essential Information

1.1 Facility Information

Facility Information	
Name of Facility:	Vancouver Energy
Site Address:	5501 NW Old Lower River Road
City, State, Zip Code	Vancouver, WA 98660
County:	Clark
SIC Code(s)	5171 Petroleum Bulk Stations and Terminals
Permit Number:	WAR (To Be Issued)
Latitude:	45° 39' 02" N
Longitude	122° 43' 41" W

1.2 Facility Contact Information

Construction Contractor(s)	
Name:	TBD prior to construction
Address:	
City, State, Zip Code	
Telephone Number:	
Fax Number:	
Email Address:	
Name:	TBD prior to construction
Address:	
City, State, Zip Code	
Telephone Number:	
Fax Number:	
Email Address:	
Facility Owner/Lessee	
Name:	Tesoro Savage Petroleum Terminal, LLC
Address:	901 W Legacy Center Way
City, State, Zip Code	Midvale, UT 94047
Telephone Number:	(801) 944-6600
Fax Number:	
Email Address:	
Property Owner	
Name:	Port of Vancouver USA
Address:	3103 NW Lower River Road
City, State, Zip Code	Vancouver, WA 98660
Telephone Number:	(360) 693-3611
Fax Number:	(360) 735-1565
Email Address:	info@portvanusa.com

Primary Construction SWPPP Contact	
Name:	TBD prior to construction
Address:	
City, State, Zip Code	
Telephone Number:	
Fax Number:	
Email Address:	

1.3 Agency Information

Responsible Agency	
Name:	Energy Facility Site Evaluation Council
Address:	1300 South Evergreen Park Drive Southwest
City, State, Zip Code	Olympia, WA 98504-3172
Telephone Number:	(360) 664-1345
Fax Number:	
Email Address:	efsec@utc.wa.gov
Name:	Washington State Department of Ecology, Southwest Regional Office
Address:	300 Desmond Drive
City, State, Zip Code	Lacey, WA 98503
Telephone Number:	(360) 407-6300
Fax Number:	(360) 407-6305
Email Address:	
Name:	Washington State Department of Ecology, Vancouver Field Office
Address:	2108 Grand Boulevard
City, State, Zip Code	Vancouver, WA 98661-4622
Telephone Number:	(360) 690-7171
Fax Number:	
Email Address:	
Emergency Numbers	
General Emergency:	9-1-1
Port of Vancouver Security	(360) 992-1120
WA DOE Report a Spill	(360) 407-6300

1.4 Stormwater Pollution Prevention Team

Primary Construction SWPPP Contact	
Name:	TBD prior to construction
Address:	
City, State, Zip Code	
Telephone Number:	
Fax Number:	
Email Address:	

Staff Name/Title	Individual Responsibilities
Construction Project Manager and Emergency Owner Contact	Individual that is the Facility owner or representative of the Facility owner to be contacted in the case of an emergency. Require individual contractors and suppliers (i.e., concrete, fuel, lubricants, coating products) to implement requirements of construction SWPPP and construction NPDES Individual Permit. Oversee construction contracts and verify work on site complies with required permit conditions.
On-site CESCL	Primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures. Coordinate implementation of construction SWPPP and construction NPDES Individual Permit including: • Installation and ongoing maintenance of required BMPs • Perform daily inspections of all applicable BMPs • Perform daily inspections of all adjacent wetlands and surface water bodies • Coordinate and/or perform sampling of construction stormwater discharges • Monitor construction dewatering for potential contaminates of concern and coordinate and/or perform sampling of construction dewatering
Resident Engineer	Resident Engineer for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative.
Emergency EFSEC Contact	Individual to be contacted at Energy Facility Site Evaluation Council in case of emergency.
Non-Emergency EFSEC Contact	Individual to be contacted at Energy Facility Site Evaluation Council.
Monitoring Personnel	This person is responsible for conducting water quality monitoring; may be same individual as the Certified Erosion and Sediment Control Lead.
Conveyance and Treatment System Operator and/or vendor	Perform all tasks necessary to maintain discharge water quality within permitted discharge limits. Tasks include, but are not limited to, • Design and modify water quality treatment system as necessary to maintain permitted discharge limits. • Inspect tanks, filters, chemical feed pumps, discharge pumps, isolation plugs and/or valves, piping, samplers, and other appurtenances as needed. • Replace consumable products on schedule prior to design life expectancy. • Be available (on-call) 24 hours a day for emergency modifications or equipment failure.
Contractor Project Managers	Verify all contractor staff is trained on construction SWPPP and SPCCP. Provide necessary equipment, tools, and cleanup and containment materials necessary to respond to accidental discharge. Verify all construction activities requiring BMPs are performed with BMPs in-place.
Equipment operators and construction personnel	Inspect equipment for signs of leaks from hydraulics, fueling and lubrication systems. Repair any equipment showing signs of faulty mechanical systems. Look for indications in work areas and excavations of possible contamination to groundwater or surface water including: petrochemical odors, suspect changes in colors, and symptoms of foul air.
All persons on site	Notify Construction Project Manager and/or CESCL of any sign of water quality impairment including spills, leaks, contamination, malfunctioning equipment, or violation of any BMPs, or construction management plan.

Executive Summary

This construction stormwater pollution prevention plan (SWPPP) has been prepared as part of the requirements for a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit as issued by the Washington State Energy Facility Site Evaluation Council for the Vancouver Energy Facility in Vancouver, Washington. The site is located within the Port of Vancouver USA (Port) and consists of a total of 47.4[1] acres located in six distinct "areas," including the rail improvements. A vicinity map and a site map are shown in Figure 1 and Figure 2, respectively.

The site primarily consists of existing vacant or underutilized industrial land. A portion of the site is located within the northern portion of the former Evergreen/ALCOA aluminum smelter. The proposed Facility consists of the construction of a rail unloading facility, transfer pipelines, storage tanks, and vessel loading berth for the transloading of crude oil from rail to vessel. The Facility includes support buildings and structures, including administrative offices, access roads, employee parking and facilities, and a future boiler building. Detailed descriptions of the site and construction follow in sections 2.1 and 2.3.

Construction activities will include clearing and grubbing, excavation, grading, relocation of on-site services/utilities, adjustments to existing port rail lines, and the construction of facility elements discussed in detail in section 2.3.

The purpose of this construction SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the construction SWPPP are to

1. Protect existing water quality and will comply with all required construction phase NPDES permits.
2. Identify site conditions, such as areas of known contaminates, and design construction methods to limit impacts to these areas. Where impacts may occur, this plan will identify construction methods and monitoring and treatment techniques to mitigate for levels of anticipated contamination.
3. Identify possible construction activities that have the potential to cause surface water or groundwater contamination and identify required best management practices (BMPs) to reduce, eliminate, or prevent contamination.
4. Prevent during the construction phase, adverse water quality impacts to the receiving water body (Columbia River) by controlling peak flow rates and volumes of stormwater runoff at the outfalls and downstream of the outfalls.

[1] Previous information submitted to EFSEC indicated an approximate site acreage of 45 acres. The addition of 2.74 acres primarily occurs relative to an increase in the transfer pipeline corridor width in locations where ground surface is currently disturbed and already subject to industrial activity. This increase in acreage does not substantively modify the analysis of environmental impacts described in the Application for Site Certification Supplement as submitted to EFSEC in January 2014. However, to present accurate engineering calculations in this construction SWPPP, this adjusted site acreage has been used herein, as well as in the operations SWPPP and Engineering Report submitted under separate cover. The Applicant also acknowledges that final Facility design will take into account actual permit conditions that are not available at this time; such conditions could also result in further adjustments to the final site boundary.

This construction SWPPP was prepared in reference to the Washington State Department of Ecology (Ecology) SWPPP template downloaded from the Ecology website on 23 December 2014. The construction SWPPP was prepared based upon the requirements set forth in the NPDES Construction Stormwater General Permit and in Ecology's *2012 Stormwater Management Manual for Western Washington*[2].

This construction SWPPP is divided into eight sections with several appendices that include reference materials related to stormwater and how it will be handled on the site. The main sections describe the site, its existing conditions, and the proposed Facility. Discussions follow of each of the 12 types of construction stormwater BMPs that would be employed during the construction of the Facility. The construction SWPPP then discusses site inspections and monitoring and reporting and recordkeeping.

[2] In accordance with WAC 463-76-031 (1)(a), construction stormwater discharges will be authorized under an individual construction stormwater NPDES permit issued by EFSEC. In the absence of a permit being available, the Applicant herein uses Ecology's general permit as the basis for plan requirements. However, prior to construction, this plan will be updated to reflect actual requirements of the permit issued by EFSEC.

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2. Site Description

The proposed Vancouver Energy (Facility) would be constructed at the Port of Vancouver USA (Port) within the City of Vancouver (City) in Clark County, Washington. The Facility includes construction in different “areas,” each area serving a different function. The site is located on the Washington shore of the Columbia River. State Route 501 (SR 501) (Lower River Road) is located immediately to the north of the site and is available from the east. Each area of the proposed Facility is described in further detail below. The entire Facility would be constructed on approximately 47.4 acres. (See the vicinity map shown in Figure 1.) Facility site plans are included as Appendix A and environmental control drawings are included in Appendix G.

Most of the site will be leased from the port and will be used exclusively by Tesoro Savage Petroleum Terminal LLC (the Applicant) for the construction and operation of the Facility. The transfer pipelines and portions of the rail improvements will be located on non-exclusive easements within the port.

The site is located in the SE 1/4 of Section 18, NW 1/4 of Section 19, and the NW and NE 1/4 of Section 20, Township 2 North, Range 1 East W.M. Berths 13 and 14 are located at approximately Columbia River Mile 103.5 (RM 103.5).

This construction stormwater pollution prevention plan (SWPPP) describes the site conditions and proposed construction activities in detail and enumerates the mitigation measures and best management practices (BMPs) that apply to each activity. The construction SWPPP has been prepared as part of the requirements for the NPDES construction stormwater permit as issued by the Washington State Energy Facility Site Evaluation Council (EFSEC) for the Facility.

The Facility would be developed in six “areas.” Figure 2 is a site plan schematic that shows the site development plan, including the location of each Facility area. Table 1 lists the six Facility areas (including rail improvements) and they are discussed in detail below. Note that the designation Area 100 is used in the engineering drawings for site overview and general information that pertains to all areas of construction.

Figure 1 - Vicinity Map

LEGEND

- Project Boundary
- Vancouver_WA
- Portland,_Oregon

VANCOUVER ENERGY

Tesoro Savage Petroleum Terminal LLC

Date: February 2015

Map Notes: Aerial photo dated July 2010, courtesy of ESRI World Imagery service

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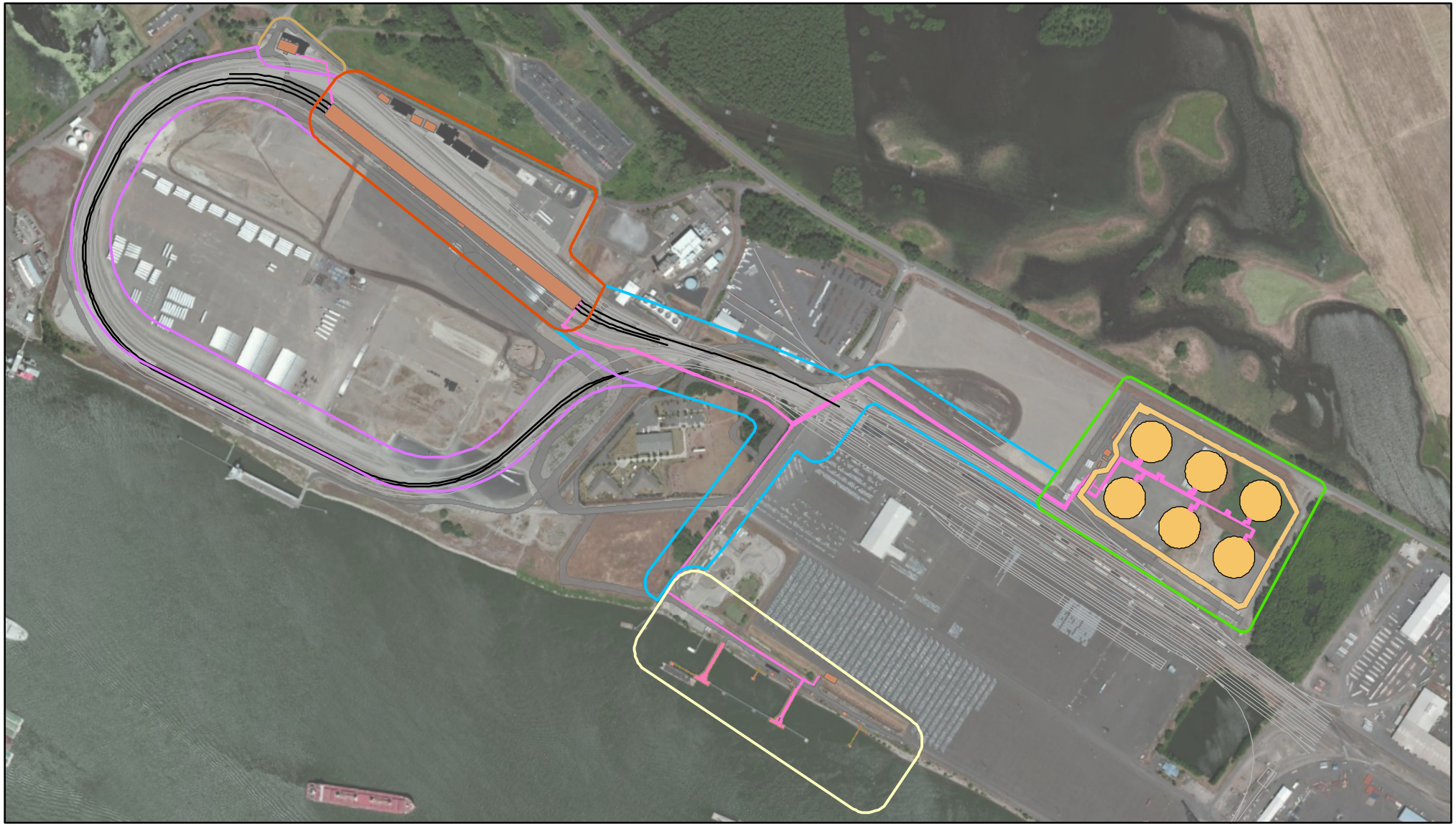

Figure 2 - Site Plan

VANCOUVER ENERGY

Tesoro Savage Petroleum Terminal LLC

Proposed Project Facilities

- Containment Berm
- Rail
- Parking
- Building
- Transfer Pipeline
- Storage Tank
- Roads
- Marine Terminal

TSPT Improvement Areas

- 200 - Unloading and Office
- 300 - Storage
- 400 - Marine Terminal
- 500 - Transfer Pipelines
- 600 - West Boiler
- Rail Infrastructure

0 250 500 1,000 Feet

N

Date: February 2015

Map Notes: Aerial photo dated July 2010, courtesy of ESRI World Imagery service

Table 1. Summary of Facility Areas

Facility Area	Project Elements	Acreage
200 – Unloading and Office	Rail Unloading Area Control Rooms/E-houses Fire Pump and Foam Building Admin/Support Buildings	7.8 Acres
300 – Storage	Crude Oil Storage Tanks Secondary Containment Berm Storage Building Pump Basin Control Room/E-house Fire Pump and Foam Building	20.8 Acres
400 – Marine Terminal	Marine Vessel Loading Hoses and Equipment Control Room/E-house Dock Safety Unit Marine Vapor Combustion Units Vapor Blower Skid Spill Prevention, Response and Containment Equipment Dock Improvements Piping from Vessel Loading to Marine Vapor Combustion Units	7.7 Acres
500 – Transfer Pipelines	Transfer Piping from Area 200 to Area 300 Transfer Piping from Area 300 to Area 400	4.9 Acres
600 – West Boiler	West Boiler Building Piping from West Boiler Building to Rail Unloading Area	0.8 Acre
Rail Improvements	Rail Transportation Corridor	5.4 Acres
Total		47.4 Acres

2.1 Existing Conditions

Thorough descriptions of the existing conditions within and adjacent to the project area follow. The descriptions are provided to delineate the geographic and natural resource elements of the Facility. Descriptions of the existing conditions include the following elements.

- Stormwater Conveyance and Treatment Systems
- Surface Water Bodies
- Floodplains
- Wetlands
- Soil Evaluations
- Past Site Remediation
- Climate

2.1.1 Stormwater Conveyance and Treatment Systems

The existing site is located in three distinct primary drainage areas. The drainage areas are segregated by topography and the stormwater is discharged to different locations. Table 2 shows which drainage area contains each of the six Facility areas.

Table 2. Drainage Basin and Facility Areas

Drainage Area	Facility Areas
Terminal 4	Area 300 – Storage Area 500 – Transfer Pipelines
Terminal 5	Area 200 – Unloading and Office Area 600 – West Boiler Building Rail Improvements
Marine Terminal	Area 400 – Marine Terminal Area 500 – Transfer Pipelines

For the purpose of this section, the three drainage areas are discussed separately. The corresponding figures indicate the drainage area in which each Facility area is located and the relationship of the Facility area to the existing collection, treatment, and detention systems.

The following sections describe each of the three primary drainage areas (Terminal 4, Terminal 5, and the Marine Terminal). The designations are intended to delineate the portion of the site described and its respective downstream drainage system. According to the port, the Marine Terminal drainage area is technically part of Terminal 4; however, it has a distinct and separate stormwater system and, for that reason, is segregated as its own descriptive area.

2.1.1.1 Terminal 4

The Terminal 4 drainage system comprises approximately 250 acres of industrial land. A system of inlets and conveyance pipelines collects stormwater from the drainage area and discharges the stormwater to the Terminal 4 water quality pond, as shown in Figure 3. The water quality pond was modified recently to increase detention time and vegetative plantings were added for shading and bio-uptake. From the water quality pond, the stormwater is routed to the southeast where it is discharged to the Columbia River through an existing outfall under an Industrial Stormwater General Permit (WAR000424) held by the Port.

Facility elements located within the Terminal 4 drainage basin are Area 300 – Storage, and a portion of Area 500 – Transfer Pipelines. There are two parallel stormwater systems running east-west along the south side of Area 300 and the portion of Area 500. The southern pipeline was installed for stormwater from the port's general use area and rail corridor. The northern pipeline was installed for the use of port tenants and is intended to bypass the water quality pond. Farwest Steel is the only current discharger into this system. During construction of the Facility, stormwater from Area 300 would be discharged into the northern pipeline. Area 500 is located within the general use area and runoff would continue to the port's stormwater system.

Both pipelines currently discharge to the Terminal 4 water quality pond. However, the port is completing a project to separate the tenant stormwater from port general use area stormwater. It is anticipated that construction of the separation project would be complete prior to construction of the Facility.

No existing stormwater collection or conveyance systems will need to be relocated or modified by construction of the Facility.

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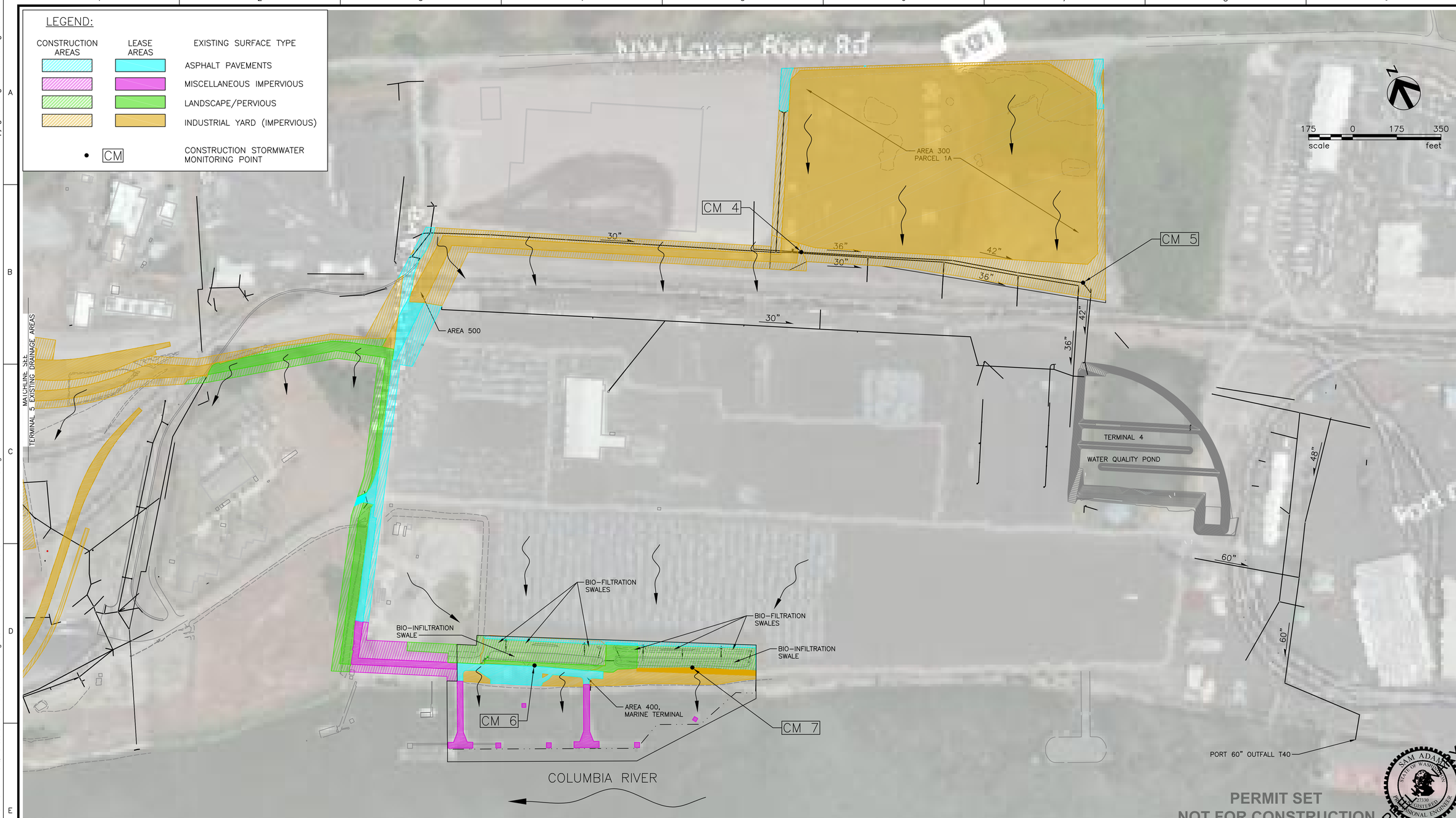

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BergerABAM
700 NE Multnomah Street, Suite 900
Portland, Oregon 97232-4189
(503) 872-4100 FAX: (503) 872-4101

VANCOUVER ENERGY
Tesoro Savage Petroleum Terminal LLC

PROJECT: VANCOUVER ENERGY
PORT OF VANCOUVER, WASHINGTON

DESCRIPTION: TERMINAL 4 – EXISTING CONSTRUCTION STORMWATER MONITORING

DESIGN:	DRS	START DATE:	2/26/2015	SCALE:	AS SHOWN
DRAWN:	TNP	PRINT DATE:	2/26/2015	PROJECT MANAGER:	SAVAGE_PM
CHECKED:	MCH	APPROVED:	SA	SIZE:	24x36
DRAWING NUMBER				SHEET	REV.
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2.1.1.2 Terminal 5

The Terminal 5 drainage system was installed as part of the remediation and decommissioning of the former Evergreen/ALCOA aluminum smelter, construction of the West Vancouver Freight Access (WVFA) project, and the Terminal 5 laydown project. The drainage system was designed and analyzed as part of the analysis for the construction of the WVFA project. A copy of the report is attached as Appendix B.

The Terminal 5 drainage area consists of approximately 91 acres of industrial land that is collected through inlets and conveyed to a common stormwater pump station as shown in Figure 4. The stormwater system includes a high flow bypass that overflows to the Columbia River. During normal operations, stormwater from the basin is pumped to two treatment lagoons that were installed to treat both process water and stormwater from the Evergreen/ALCOA plant. The lagoons are capable of treating stormwater prior to its discharge to the Columbia River under a Western Washington Phase II Municipal Stormwater Permit, WAR045201.

On the Facility site, three legs of the existing stormwater system run north/south through the proposed rail unloading facility. The west lateral extends towards Old Lower River Road for future use, the middle lateral collects runoff from atop the Vanexco Cap, and the east lateral collects stormwater from a portion of Old Lower River Road and NGL Supply. The middle lateral conveys only stormwater that collects from a liner system installed above the contaminated material; stormwater from this area is only exposed to existing General Use industrial yard areas, and a portion of the rail transportation corridor. The Facility areas that would be constructed on Terminal 5 include Area 200, Area 600, and a portion of Area 500.

Modifications to the existing collection system for Terminal 5 is included in section 2.3.1. No modifications are proposed to the downstream conveyance system, pump station, or treatment lagoons.

2.1.1.3 Marine Terminal

The Marine Terminal is located within Terminal 4, however, stormwater in this area is a separate stormwater system. The system was installed with Phase I of the Columbia Gateway project in 1995. The stormwater serves three operational areas, including a gravel barge unloading operated by CalPortland/Glacier Northwest, an Auto Terminal consisting of first point of rest unloading and service facility for Subaru, and the proposed Facility infrastructure for the Marine Terminal. In total, the drainage area consists of approximately 25 acres. Stormwater is collected through a series of inlets and conveyance pipes from which it is discharged to the treatment and infiltration swales, except for the existing Marine Terminal area, which sheet flows directly into the infiltration swales.

Stormwater is collected and discharged to biofiltration swales for basic water quality treatment and then flows into two hydraulically connected infiltration swales. Figure 4 shows the general arrangement of the collection and treatment facilities located at the Marine Terminal.

Modifications to the existing collection and treatment systems would be completed within the Marine Terminal drainage area. A detailed explanation of modifications to the existing system is included in section 2.3.3.

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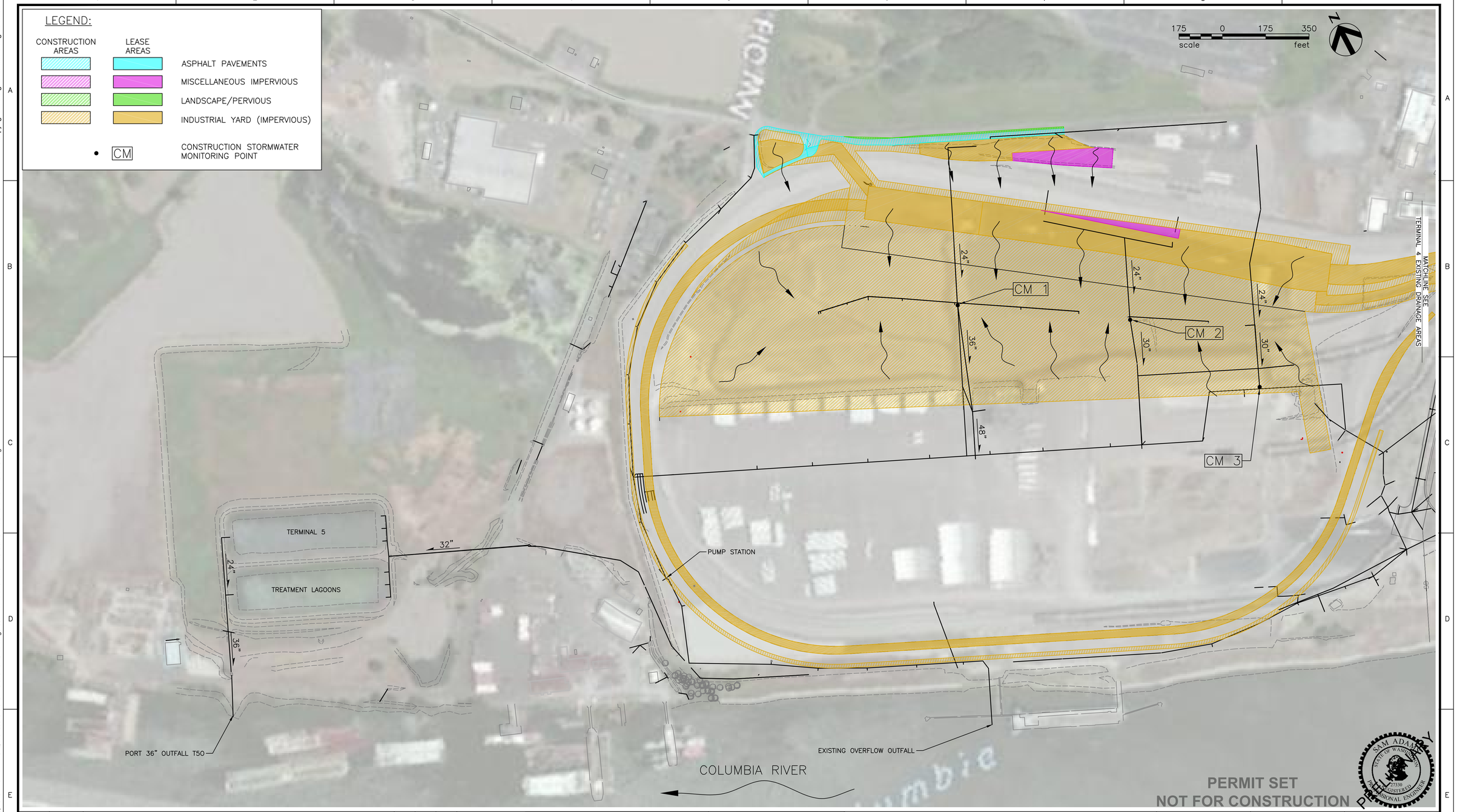

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BergerABAM
700 NE Multnomah Street, Suite 900
Portland, Oregon 97232-4189
(503) 872-4100 FAX: (503) 872-4101

VANCOUVER ENERGY
Tesoro Savage Petroleum Terminal LLC

PROJECT: VANCOUVER ENERGY
PORT OF VANCOUVER, WASHINGTON

DESCRIPTION: TERMINAL 5 – EXISTING CONSTRUCTION STORMWATER MONITORING

DESIGN:	DRS	START DATE:	2/26/2015	SCALE:	AS SHOWN
DRAWN:	TNP	PRINT DATE:	2/26/2015	PROJECT MANAGER:	SAVAGE_PM
CHECKED:	MCH	APPROVED:	SA	SIZE:	24x36
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2.1.2 Surface Water Bodies

The Facility site is located immediately north of the Columbia River and portions of the site are bordered by wetlands. A discussion of the wetlands follows in section 2.1.4. No streams or open surface water features are located within the upland areas of site development. A portion of the project will modify the existing Berth 13 and work over water is covered under separate permit.

The project site is located within the Salmon-Washougal Watershed (WRIA 28) located in southwest Washington. The nearest surface water feature is the Columbia River. The river drains an estimated basin of roughly 258,000 square miles and is approximately 1,243 miles long. The project site is located at approximately RM 103.5. The Columbia River eventually discharges to the Pacific Ocean near Astoria, Oregon.

Multiple government agencies and non-governmental organizations monitor water quality within the Columbia River. The U.S. Geological Service (USGS) is the federal agency responsible for conducting water quality testing in the river. In 2004–2005, the USGS conducted water column samples. Significant findings of the Water-Quality Data, Columbia River Estuary, 2004-2005 report are summarized below.

- None of the aquatic life or human health benchmarks established by the U.S. Environmental Protection Agency were exceeded.
- Concentrations of arsenic, copper, and lead were not present at levels of concern with regards to aquatic toxicity.
- Trace element concentration were higher downstream than at the upstream reaches of the Columbia River.
- Eight of the 54 wastewater compounds analyzed were detected at least once, usually at trace levels. Bisphenol A was the only endocrine disruptor in wastewater compounds detected in the Columbia River.
- During seasonal samplings of suspended sediment, no organochlorine compounds or polycyclic aromatic hydrocarbons (PAHs) were detected
- All 11 polybrominated diphenyl ether (PBDE) congeners were detected on suspended sediments, usually in trace amounts.
- 102 of the 209 PCB congeners were detected on suspended sediments, usually in trace amounts.

A copy of the report is available from the USGS at http://pubs.usgs.gov/ds/2006/213/#download. Additionally, the USGS report "Water Quality of the Lower Columbia River Basin: Analysis of Current and Historical Water-Quality Data through 1994" can be downloaded at http://or.water.usgs.gov/pubs_dir/Abstracts/95-4294.html.

The average water level in the Columbia River is usually 7 to 8 feet (National Geodetic Vertical Datum [NGVD] 29) during the winter. Flood stage is considered to occur at 16 feet when low level flooding begins to occur. A detailed discussion of the floodplain limits follows as section 2.1.3. The flood of record is a 1996 event when the river crested at 27.2 feet. This is not the highest recorded event, which occurred on 13 June 1948 with a crest of 31.00 feet.

2.1.3 Floodplains

The local floodplain within the project vicinity is defined by the Columbia River. This lower portion of the Columbia River is generally regulated by the upstream Bonneville Dam. Flooding in and adjacent to the site from the north watershed, including Vancouver Lake, is hydraulically connected directly to the elevation of the water surface of the Columbia River.

This site area has been extensively studied for floodplain and flood impacts. The most recent analysis was conducted by the Federal Emergency Management Agency (FEMA), which developed Flood Insurance Rate Maps (FIRM) published on 5 September 2012. The base flood elevation and limits are shown on the FIRM maps contained in Appendix C. The FEMA FIRMs that cover the project site are Map Item ID Nos. 53011C0363D and 553011C0364D.

Table 3 summarizes the floodplain elevations discussed below in the different vertical datums. North American Vertical Datum (NAVD) 88 is the vertical datum used by FEMA in the FIRM mapping, while NGVD 1929 is the datum used by the Port and the Facility. The NGVD 1929 datum is also the datum referenced in the historical flood record maintained by Clark County. The Columbia River Datum (CRD) is used by river users and is based on relative elevations to water levels.

Table 3. Floodplains

Floodplain	NAVD 88	NGVD 1929	CRD
100 Year	30.0	26.9	25.3
500 Year	33.7	30.6	29.0

2.1.3.1 100-Year Floodplain

The Base Flood Elevation (BFE) is identified in the FIRM for the 100-year floodplain as 30 feet based on the NAVD 88 datum. The limits of the 100-year floodplain are classified in the FIRMs as Zone AE, which indicates that there is a 1 percent annual chance flood, with the BFE being the water surface elevation of the 1 percent annual chance flood.

The 100-year floodplain is generally located along the top of the riverbank. The FIRMs show an isolated component of the 100-year floodplain encroaching into Area 300 on Terminal 4 and Area 600 at Terminal 5. The 2012 FIRM maps do not reflect the grading and filling of these sites that has occurred on site. Because of filling and grading completed by the Port, the existing ground elevations is outside of the 100-year floodplain at approximately Elevation 32 NGVD 1929. A detailed description of the prior authorizations for filling this area is included in the Application for Site Certification.

2.1.3.2 500-Year Floodplain

The 500-year floodplain is identified in the FIRM as Zone X with the black dotted hatch pattern. Zone X is an area with a 0.2 percent annual chance flood. The 0.2 percent annual chance flood is listed with average depth of less than 1 foot.

With very little exception, the 500-year floodplain extends across the entire project site. The rough grading completed since the adoption of the 2012 FIRMs does not affect the limits of the 500-year floodplain.

2.1.4 Wetlands

The National Wetland Inventory map for Vancouver (U.S. Fish and Wildlife Service 1989) indicates the presence of numerous wetlands within the project vicinity. Before development, nine wetlands, totaling approximately 16 acres in size, were present on this site, but they were all filled through permitted actions that began in 1996.

There are two wetland mitigation sites in the vicinity of the project site. The approximately 7.9-acre Parcel 1A wetland mitigation site, located immediately east of Area 300, was established in 1994. This is a depressional, palustrine forested wetland vegetated with mature black cottonwood trees and a variety of native shrubs and herbaceous species. Stormwater from Area 300 or Area 500 would not discharge to any existing wetlands. The wetlands are not hydraulically connected to any of the project elements.

The Parcel 2 wetland mitigation site is an approximately 16.4-acre mitigation site situated immediately north of the existing Terminal 5 site. The wetland was established in 2000 for impacts associated with the initial development of Parcel 1A. The site is currently a mosaic of forested, scrub-shrub, and emergent vegetation. Stormwater from the Facility would not discharge to Parcel 2 wetlands.

The most significant complex of wetlands in the general vicinity is associated with the southern end of Vancouver Lake. The wetlands in this area are a mosaic of emergent, scrub-shrub, and forested wetlands that are hydraulically connected to Vancouver Lake and, by extension, the Columbia River. These wetlands provide high quality seasonally inundated and tidally influenced habitats that most closely resemble the original hydrologic and wetland habitat functions of the Vancouver Lake Lowlands.

2.1.5 Soils Evaluation

Geotechnical Resources, Inc. (GRI) performed geotechnical investigations for the proposed Facility. The geotechnical investigations are attached as Appendix D. Detailed soil maps are included in Appendix D. Construction on the site would disrupt surficial soils and minor topographical grading will be necessary for facility construction. Construction of the Facility will not change the geologic condition of the site.

2.1.6 Past Site Remediation

Terminal 5 is the former location of the Evergreen/ALCOA smelter, which operated until the early 2000s. Industrial and solid wastes from the construction and operation of the aluminum smelter were stored in waste piles and consolidated in landfills on site over the years. Hazardous contaminants in these wastes include petroleum hydrocarbons, polychlorinated biphenyls (PCBs), cyanide, fluoride, trichloroethylene (TCE), low-level organic chemicals, and metals. Evergreen and ALCOA completed site remediation and facility decommissioning under Consent Decree No. 09-2-00247-2 and Enforcement Order 4931 with Ecology. Efforts included removing structures and foundations to a depth of approximately 4 feet and the site soil and sediment with concentrations of chemicals of concern above the cleanup levels established by the consent decree.

Five cap locations subject to environmental restrictive covenants are located within the boundary of the Facility. The Terminal 5 area also includes a groundwater restrictive covenant. For detailed descriptions of the landfill areas, caps, and contaminates of concern, see the contaminated media management plan (CMMP), which has been prepared under a separate cover. These areas are shown in Figure 5.

Construction of the Facility would make minor modifications to the Vanexco/Rod Mill Site Cap. The remaining construction activities located within the Facility lease boundaries have been designed to avoid impacts and work within the landfill areas. Work within the restrictive covenant areas is limited to work outside of the landfill limits or above the cap. Detailed descriptions of this work follow in section 2.3.7. Construction of the rail improvements will require minor modifications to the North/North 2 Landfill, Spent Pot Liner Storage Area, and the Ingot Cap similar to those completed as part of the current WVFA project.

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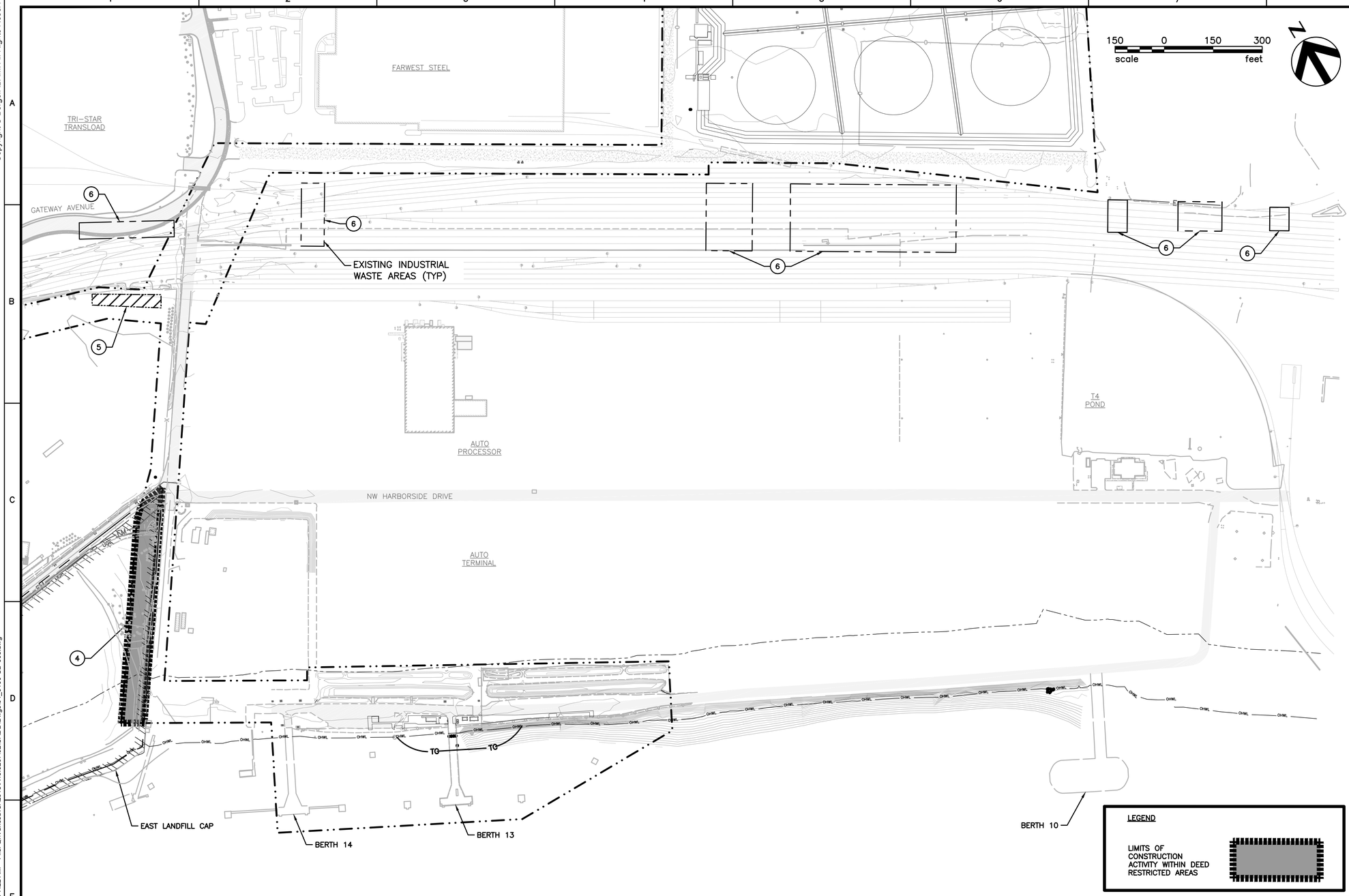

GENERAL NOTES:

1. CONTRACTOR'S ACTIVITY SHALL STRICTLY COMPLY WITH ALL PERMITTED CONDITIONS OF APPROVAL.
2. EXCAVATIONS AND GROUND DISTURBING ACTIVITIES WITHIN DEED RESTRICTED AREAS REQUIRES NOTIFICATION TO THE WASHINGTON STATE ENERGY FACILITY SITE EVALUATION COUNCIL (EFSEC) AND COMPLIANCE WITH THE APPROVED CONTAMINATED MEDIA MANAGEMENT PLAN, APPLICABLE PORT PROTOCOLS AND ADDITIONAL REQUIREMENTS PROVIDED BY EFSEC.
3. SPECIFIC LIMITS FOR THE EAST LANDFILL LIMITS ARE PROVIDED BASED UPON PRIOR SURVEY'S CONDUCTED BY HDJ DESIGN GROUP. WORK LIMIT SHALL ENCROACH UPON THE BOUNDARY OF THE EAST LANDFILL.
4. WHERE KNOWN, ADDITIONAL AREAS OF CONCERN AND POSSIBLE CONTAMINATED MEDIA LOCATIONS HAVE BEEN GENERALLY DEPICTED. CONTRACTOR SHALL COORDINATE FULLY WITH PORT OF VANCOUVER ENVIRONMENTAL STAFF AND INSPECTORS FOR MONITORING AND TESTING OF EXCAVATED MEDIA FOR POSSIBLE CONTAMINATES. PORTIONS OF AREA 200 AND AREA 500 ARE SPECIFICALLY IDENTIFIED WHERE CONTAMINATION IS LIKELY TO BE ENCOUNTERED DURING EXCAVATIONS.
5. IF MEDIA INCLUDING SOILS, OR GROUNDWATER ARE ENCOUNTERED THAT INDICATE POSSIBLE CONTAMINATION, CONTRACTOR SHALL NOTIFY VANCOUVER ENERGY SITE MANAGER, PORT OF VANCOUVER AND EFSEC IMMEDIATELY PRIOR TO PROCEEDING. SIGNS OF CONTAMINATION INCLUDE UNUSUALLY DARK SOIL AND ODORS.
6. IN AREAS OF CONCERN EXCAVATED MATERIAL SHALL BE PLACED IN SEALED WATER-TIGHT CONTAINERS OR LINED STAGING AREAS IMMEDIATELY ADJACENT TO THE WORK AREA FOR TESTING AND CLASSIFICATION OF MATERIAL PRIOR TO HAUL OFF.

CONTAMINATED MEDIA NOTES:

(4) CONSTRUCTION WITHIN THE EAST LANDFILL CAP AREA CONSISTS OF GRADING A SUITABLE LEVEL BENCH WITHIN THE DEED RESTRICTED AREA TO CONSTRUCT FOUNDATIONS FOR THE CRUDE OIL PIPELINE. CONSTRUCTION ACTIVITIES SHALL NOT ENCROACH UPON THE LANDFILL AREA ITSELF AND SHALL REMAIN EAST OF THE HIGH VISIBILITY FENCING DELINEATED ON THE EROSION CONTROL PLANS.

(5) PORT OF VANCOUVER IDENTIFIED POCKETS OF CONTAMINATED GROUNDWATER AND SOIL WITHIN THIS AREA. CONTRACTOR SHALL BE ADVISED THAT WORK ADJACENT TO THIS AREA WILL REQUIRE TESTING OF EXCAVATED MATERIAL PRIOR TO DISPOSAL.

(6) NO CONSTRUCTION ACTIVITY IS PROPOSED IN THESE AREAS OF INDUSTRIAL WASTE. PORT HAS COMPLETED CLEANUP OF THESE SITES DURING RAIL CONSTRUCTION WHERE FEASIBLE.

PERMIT SET
NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	CK'D	APP

BergerABAM
700 NE Multnomah Street, Suite 900
Portland, Oregon 97232-4189
(503) 872-4100 FAX: (503) 872-4101

VANCOUVER ENERGY
Tesoro Savage Petroleum Terminal LLC

PROJECT: VANCOUVER ENERGY
PORT OF VANCOUVER, WASHINGTON

DESCRIPTION: CONTAMINATED MEDIA LOCATIONS – 2

DESIGN:	DRS	START DATE:	2/25/2015	SCALE:	AS SHOWN
DRAWN:	TNP	PRINT DATE:	2/25/2015	PROJECT MANAGER:	SAVAGE_PM
CHECKED:	MCH	APPROVED:	SA	SIZE:	24X36

DRAWING NUMBER: 0100-CD-003 | SHEET 1/1 | REV.

Last Saved by: Tony.pritchett on: Feb 25, 2015 7:22 AM File: Q:\Vancouver\2013\A13.0267\02\CADD\Dwgs\04_0100-CD-003.dwg

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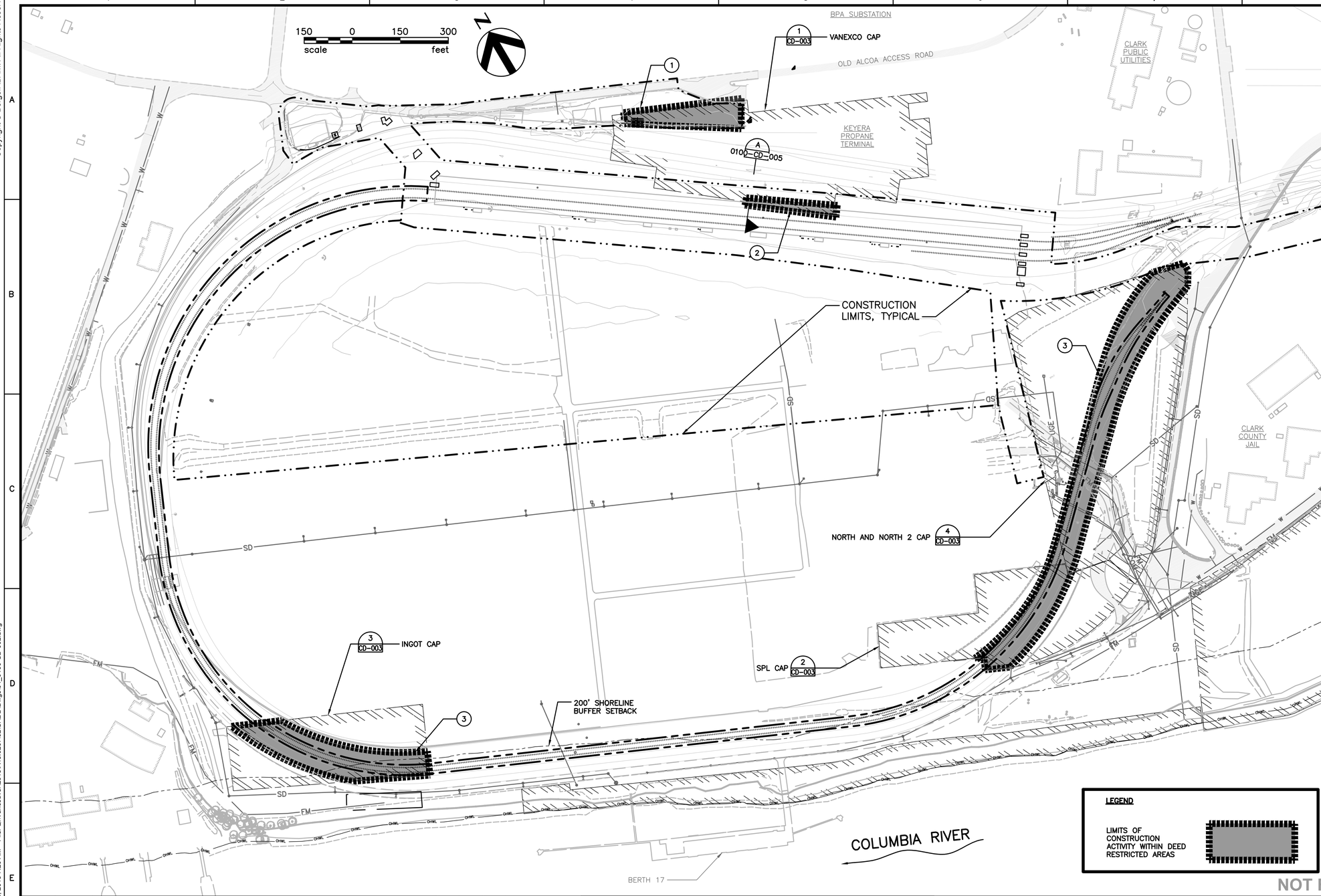

GENERAL NOTES:

1. CONTRACTOR'S ACTIVITY SHALL STRICTLY COMPLY WITH ALL PERMITTED CONDITIONS OF APPROVAL.
2. EXCAVATIONS AND GROUND DISTURBING ACTIVITIES WITHIN DEED RESTRICTED AREAS REQUIRES NOTIFICATION TO THE WASHINGTON STATE ENERGY FACILITY SITE EVALUATION COUNCIL (EFSEC) AND COMPLIANCE WITH THE APPROVED CONTAMINATED MEDIA MANAGEMENT PLAN, APPLICABLE PORT PROTOCOLS AND ADDITIONAL REQUIREMENTS PROVIDED BY EFSEC.
3. SPECIFIC LIMITS FOR THE EAST LANDFILL LIMITS ARE PROVIDED BASED UPON PRIOR SURVEY'S CONDUCTED BY HDJ DESIGN GROUP. WORK LIMIT SHALL ENCROACH UPON THE BOUNDARY OF THE EAST LANDFILL.
4. WHERE KNOWN, ADDITIONAL AREAS OF CONCERN AND POSSIBLE CONTAMINATED MEDIA LOCATIONS HAVE BEEN GENERALLY DEPICTED. CONTRACTOR SHALL COORDINATE FULLY WITH PORT OF VANCOUVER ENVIRONMENTAL STAFF AND INSPECTORS FOR MONITORING AND TESTING OF EXCAVATED MEDIA FOR POSSIBLE CONTAMINATES. PORTIONS OF AREA 200 AND AREA 500 ARE SPECIFICALLY IDENTIFIED WHERE CONTAMINATION IS LIKELY TO BE ENCOUNTERED DURING EXCAVATIONS.
5. IF MEDIA INCLUDING SOILS, OR GROUNDWATER ARE ENCOUNTERED THAT INDICATE POSSIBLE CONTAMINATION, CONTRACTOR SHALL NOTIFY VANCOUVER ENERGY SITE MANAGER, PORT OF VANCOUVER AND EFSEC IMMEDIATELY PRIOR TO PROCEEDING. SIGNS OF CONTAMINATION INCLUDE UNUSUALLY DARK SOIL AND ODORS.
6. IN AREAS OF CONCERN EXCAVATED MATERIAL SHALL BE PLACED IN SEALED WATER-TIGHT CONTAINERS OR LINED STAGING AREAS IMMEDIATELY ADJACENT TO THE WORK AREA FOR TESTING AND CLASSIFICATION OF MATERIAL PRIOR TO HAUL OFF.

CONTAMINATED MEDIA NOTES:

1. CONSTRUCTION ACTIVITIES WITHIN THIS PORTION OF THE VANEXCO CAP WILL BE LIMITED TO GROUND DISTURBANCES ABOVE THE EXISTING CONCRETE CAP. SOME MINOR EXPOSURE OF THE CONCRETE SURFACE MAY OCCUR IN LOCALIZED AREAS. NO WORK WITHIN THIS AREA WILL REMOVE OR PENETRATE PORTIONS OF THE CAP.

2. CONSTRUCTION ACTIVITIES WITHIN THIS PORTION OF THE VANEXCO CAP WILL RESULT IN MODIFICATION OF THE UNDERDRAIN SYSTEM AND HDPE LINER. DISCHARGES FROM THE UNDERDRAIN SYSTEM WILL BE RE-ROUTED TO AVOID CONFLICTS WITH THE PROPOSED RAIL UNLOADING BUILDING FOUNDATIONS AND CONTAINMENT TRENCHES, SEE DWG 0100-CD-006 FOR LINER PENETRATION DETAIL, AND SHEET 0100-CD-007 FOR NEW STORMWATER DETAILS. LINER WILL BE EXTENDED TO AND TIED INTO THE GRADE BEAMS OF THE RAIL UNLOADING BUILDING FOUNDATION SEE DWG 0100-CD-006 FOR DETAILS. FOUNDATIONS OF THE RAIL UNLOADING BUILDING WITHIN THE EXISTING CAP AREA WILL BE LIMITED TO SHALLOW SPREAD FOOTINGS TO LIMIT EXCAVATION ACTIVITIES. CONSTRUCTION OF RAIL UNLOADING BUILDING CONSISTS OF FULLY IMPERVIOUS ROOF WITH CAST-IN-PLACE CONCRETE SURFACING WITH FLOOR DRAINS. ALL RAINWATER WILL BE COLLECTED AND DIVERTED, THEREBY EXCLUDING SURFACE WATER FROM ENTERING CAP AREA.

3. CONSTRUCTION WITHIN THE INGOT CAP, SPL CAP, AND NORTH AND NORTH 2 CAP AREAS ARE LIMITED TO RAIL IMPROVEMENTS ONLY. RAIL LINES TO BE UNDER TSJV CONTROL ARE PERMITTED UNDER EFSEC APPLICATION. CONSTRUCTION DRAWINGS, DETAILS, AND CONSTRUCTION ADMINISTRATION FOR ADDITIONAL 2 RAIL LOOPS WILL BE COMPLETED BY THE PORT OF VANCOUVER AS DISCUSSED IN THE LEASE AGREEMENT.

PERMIT SET
NOT FOR CONSTRUCTION

SAM ADAMS — STATE OF WASHINGTON — 27330 — REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY	CK'D	APP

BergerABAM
700 NE Multnomah Street, Suite 900
Portland, Oregon 97232-4189
(503) 872-4100 FAX: (503) 872-4101

VANCOUVER ENERGY
Tesoro Savage Petroleum Terminal LLC

PROJECT: VANCOUVER ENERGY
PORT OF VANCOUVER, WASHINGTON

DESCRIPTION: CONTAMINATED MEDIA LOCATIONS – 1

DESIGN:	DRS	START DATE:	2/25/2015	SCALE:	AS SHOWN
DRAWN:	TNP	PRINT DATE:	2/25/2015	PROJECT MANAGER:	SAVAGE_PM
CHECKED:	MCH	APPROVED:	SA	SIZE:	24X36

DRAWING NUMBER: 0100-CD-002 — SHEET 1/1 — REV.

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2.1.7 Climate

The climate of the city is predominantly temperate, characterized by wet, mild winters and dry warm summers. The climate is influenced by the relative proximity of the Pacific Ocean and the Cascade and Coast ranges of Oregon and Washington. Temperature and precipitation measurement records from the "Vancouver 4 NNE" agricultural meteorological station were accessed to analyze the climate at the project site. The station is located approximately 4 miles northeast of the project site and has been collecting measurements since 1856. The maximum temperature ever recorded at the site was 106°F on 30 July 2009 and minimum temperature recorded was -8.0°F in 1909. The site averages about 39.6 inches of rainfall and 6.5 inches of snow a year, with most of the precipitation occurring during the winter months. Prevailing winds are from the west-northwest.

Isopluvial mapping of Washington was prepared by the National Oceanic and Atmospheric Administration. Table 4 shows estimates of precipitation amounts for the following design storms as shown in Volume IX of the NOAA Atlas 2 and attached in Appendix E.

Table 4. Design Storm Rainfall Intensity

Design Storm	Precipitation (in.)
2-Year, 24-Hour	2.4
5-Year, 24-Hour	2.7
10-Year, 24-Hour	3.2
25-Year, 24-Hour	3.6
50-Year, 24-Hour	4.0
100-Year, 24-Hour	4.3

Precipitation amounts shown in Table 4 are used in the conveyance system model which uses the SCS Type 1A rainfall distribution hydrograph to determine the peak flow rates for the design storm. The Western Washington Hydraulic Model (WWHM) used catalogued map information that is automatically selected when the project site is selected. The gauge used in the WWHM is "Portland" with a precipitation factor of 0.933.

2.2 Proposed Facility Description

The project would construct a facility to receive crude oil by rail, store it on site, and load it on marine vessels for shipment to end users primarily located on the West Coast. Unit trains would arrive at the project site and be stationed on the Facility rail loops. The trains would be brought to the unloading area (Area 200) where the crude oil would be gravity-drained into the collection piping system, and pumped into the transfer pipeline system (Area 500). Crude oil would be pumped through the transfer pipelines to the storage tanks (Area 300) where it would be held until marine vessel loading operation. Marine vessels would arrive and moor at the dock (Area 400). Crude oil would be pumped from the storage tanks or unloading building to the loading area and loaded to marine vessels. A complete facility description is located within the Application for Site Certification.

Table 5 summarizes the entire surface coverage for the Facility. Detailed Facility area data and runoff volumes is described in the following sections. The existing surface coverages used to calculate runoff for Pre-Construction and During Construction for all of the runoff tables below are derived from the surfaces indicated in Figures 3 and 4.

Table 5. Facility Site Summary

	Pre-Construction	During Construction	Completed Facility
Total Site Area	47.4 Acres	103.9 Acres	47.4 Acres
Percent Impervious	95.7 %	94.7 %	93.7 %
Disturbed Area	40.4 Acres	96.1 Acres	43.4 Acres
2-Year Peak Runoff	15.68 cfs	37.75 cfs	15.23 cfs
10-Year Peak Runoff	24.60 cfs	59.13 cfs	23.86 cfs
25-Year Peak Runoff	29.66 cfs	71.30 cfs	28.76 cfs
100-Year Peak Runoff	38.02 cfs	91.34 cfs	36.86 cfs

2.3 Proposed Construction Activities

2.3.1 Area 200 – Unloading and Office

The primary element within the Unloading and Office area is the construction of the rail unloading facility and administrative/support building areas. The rail car unloading facility is a covered structure through which the trains would be pulled and secured for unloading. The structure would be approximately 1,850 feet long by 90 feet wide and has a maximum height of approximately 50 feet. The building structure would be open on the north, west, and east sides, while the southern wall would be partially enclosed to act as a weather break along the southern wall.

Each track would include unloading stations for handling of crude oil. Each station will use a completely closed loop of piping to prevent by design any atmospheric contact with the product during unloading. The entire 1,850 feet of unloading facility includes full length coverage rail collection pans, and the interior surfaces are concrete to provide containment for any accident releases as well as provide catchments for all stormwater that drips from rail cars or is blown into the unloading facility by the wind.

All mechanical piping is primarily located in concrete secondary containment trenches and the pump basins utilized for transferring product from the unloading facility to the storage tanks are below-grade concrete basins. The collection piping from the rail drip pans and facility floor drains is also located in these concrete trenches with discharge pumps located in the pump basins. Any water collected from within the unloading facility would be collected in these systems and pumped to two containment tanks located at the administrative and support building areas. There is no connection to storm or sanitary sewer from within the rail unloading facility.

Several accessory structures and equipment pads are located adjacent to the rail unloading facility. These buildings include electrical houses (E-houses) control rooms, fire pump and foam building, electrical equipment pads, and mechanical equipment pads.

The administrative and support buildings are located north of the rail unloading facility adjacent to Old Lower River Road. This area consists of three proposed modular structures, parking, and associated landscaping. In addition, the containment tanks for discharges from the rail unloading facility are located near the parking lot. A pedestrian bridge is proposed to connect the administrative/support buildings to the rail unloading facility.

Associated utility extension and relocations for communication, electrical, water service and sanitary sewer are also included.

Construction activities in the area would include site preparation, temporary and permanent erosion and sediment control (TESC) installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, installation of underground utilities including water, sewer, and storm drainage, building foundation and pump pit excavations and construction, construction of building elements, installation of mechanical systems, and final site stabilization, including restoration of industrial yard, gravel access roads, site paving, and final landscape installation.

Stormwater runoff flow rates and volumes were calculated using the WWHM for the Area 200 facility elements. During construction, stormwater and excavation dewatering would be collected on site in above-grade tankage or sediment ponds. Stormwater from the tanks would be treated prior to discharge to the existing on-site stormwater system. A detailed discussion of the BMPs and monitoring systems used during construction is included as section 3.

Table 6 summarizes Area 200 and WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Area 200 results are included in the Analysis Results as Point of Compliance (POC) 1. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 6. Area 200 - Unloading and Office - Site Summary

.	Pre-Construction	During Construction	Completed Facility
Total Site Area	7.8 Acres	47.3 Acres	7.8 Acres
Percent Impervious	100 %	98.1 %	95.4 %
Disturbed Area	7.8 Acres	47.2 Acres	7.4 Acres
2-Year Peak Runoff	3.21 cfs	19.45 cfs	3.03 cfs
10-Year Peak Runoff	5.03 cfs	30.47 cfs	4.75 cfs
25-Year Peak Runoff	6.07 cfs	36.74 cfs	5.72 cfs
100-Year Peak Runoff	7.78 cfs	47.06 cfs	7.33 cfs

2.3.2 Area 300 – Storage

The Storage Area is dominated by the construction of the storage tanks and associated containment areas. In addition, the area includes a single pump basin used to transfer crude oil from the storage tanks to the Marine Terminal and associated support buildings and equipment pads.

The Facility includes six double-bottom, internal floating-roof aboveground storage tanks (ASTs) for storing crude oil. The tanks would be approximately 48 feet in height and 240 feet in diameter and have a shell capacity of approximately 380,000 barrells (bbl) each. Each tank can store a maximum of approximately 360,000 bbl of product, which accounts for the presence of the internal floating roof and the headspace required to allow product movement in the event of a seismic event.

The tanks would be field-erected on a ring wall style footing. Ground improvements will be required to improve soil conditions underneath the storage tanks. An impervious liner system would be installed within the containment area to protect sub-surface native soils from any accidental discharge. The containment area includes an earthen perimeter berm of approximately 6 feet in height sized to contain the release of an entire tank volume plus 10 percent and a 100-year rainfall event. Intermediate berms approximately 2 feet tall between each tank additionally segregate the containment area.

The support buildings, including a storage building, fire pump and foam building, E-houses, electrical pads, and mechanical pads, would be constructed outside of the containment area on slab on grade footings. The pump basin would be isolated from the containment area by its concrete walls and basin that would serve as secondary containment.

The containment area includes a stormwater system that is segregated from the rest of the site. The system inside the containment area includes catch basins, structures, piping, control structures, and oil-water separators. All stormwater structures inside the containment area would be installed above the liner system.

Site improvements would also include utility extensions and relocations as necessary. A portion of the aboveground crude oil transfer piping would be installed within Area 300.

Construction activities in the area include site preparation, TESC installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, installation of underground utilities including water, sewer, and storm drainage, tank and building foundation and ground improvements, tank and building construction, installation of mechanical systems, and final site stabilization including restoration of industrial yard, gravel access roads, site paving, and final landscape installation.

Stormwater runoff volumes were calculated using the WWHM. During construction stormwater and excavation dewatering would be collected on site in above-grade tankage or sediment ponds. Stormwater from the tanks would be treated prior to discharge to the existing on-site stormwater system. A detailed discussion of the BMPs and monitoring systems used on site during construction is included in section 3.

Table 7 summarizes Area 300 and the WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Area 300 results are included in the Analysis Results as POC 2. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 7. Area 300 - Storage - Site Summary

	Pre-Construction	During Construction	Completed Facility
Total Site Area	20.8 Acres	24.9 Acres	20.8 Acres
Percent Impervious	100 %	100 %	92.5 %
Disturbed Area	20.8 Acres	24.9 Acres	19.2 Acres
2-Year Peak Runoff	8.57 cfs	10.26 cfs	7.95 cfs
10-Year Peak Runoff	13.43 cfs	16.07 cfs	12.46 cfs
25-Year Peak Runoff	16.19 cfs	19.38 cfs	15.03 cfs
100-year Peak Runoff	20.74 cfs	24.83 cfs	19.25 cfs

2.3.3 Area 400 – Marine Terminal

Crude oil would be transferred from the Storage Area to the Marine Terminal. Improvements at the Marine Terminal include upland construction of support facilities and improvements to the existing dock to meet current seismic standards. Improvements at the dock includes reinforcing of the existing steel piles supporting Berth 13 and mooring points, replacement of dock deck and steel trestles, and new grated steel walkways. Improvements upland include new abutment, associated ground improvements along the shoreline, fire pump and foam building, a combined control room and E-house, marine vapor combustion units, and associated site improvements including, utilities, stormwater improvements, access roads and parking, and landscaping.

The dock includes a containment area for the work areas, including all flanges and transfer hose areas. Pedestrian walkways connecting the dock to the dolphins and mooring points would be replaced or constructed with new grated steel. The access trestle would be prefabricated steel deck with concrete infill.

Upland electrical gear and the marine vapor combustion units would be located on slab-on-grade foundations. The fire pump and foam building, and the two-story E-house/Control Room, would be on

drilled piers. Additional site improvements include ground improvements along the aboveground transfer pipeline, paved access roads and parking, underground utility relocations and extensions, stormwater improvements, and permanent landscaping.

Construction activities in the area include site preparation, TESC installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, installation of underground utilities including water and storm drainage, building foundation and ground improvements, building construction, installation of mechanical systems, and final site stabilization including paved access roads, site paving, and final landscape installation.

Stormwater runoff volumes were calculated using WWHM. During construction, stormwater and excavation dewatering would be collected and treated prior to discharge to the existing on-site stormwater system. A detailed discussion of the BMPs and monitoring systems used on site is included in section 3.

Table 8 summarizes Area 4 and the WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Area 400 results are included in the Analysis Results as POC 3. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 8. Area 400 - Marine Terminal - Site Summary

	Pre-Construction	During Construction	Completed Facility
Total Site Area	7.7 Acres	12.0 Acres	7.7 Acres
Percent Impervious	93.8 %	79.0 %	88.1 %
Disturbed Area	1.8 Acres	2.2 Acres	1.1 Acres
Undisturbed Bank & Open Water Areas	5.0 Acres	6.8 Acres	5.2 Acres
Overwater Coverage	0.5 Acres	0.5 Acres	0.5 Acres
2-Year Peak Runoff	0.74 cfs	0.91 cfs	0.48 cfs
10-Year Peak Runoff	1.16 cfs	1.42 cfs	0.75 cfs
25-Year Peak Runoff	1.40 cfs	1.71 cfs	0.90 cfs
100-Year Peak Runoff	1.80 cfs	2.19 cfs	1.16 cfs

2.3.4 Area 500 – Transfer Pipelines

A combination of above- and below-ground steel transfer pipelines would convey crude oil from the rail unloading structure in Area 200 to the storage tanks in Area 300 and from the storage tanks to the marine vessel loading system in Area 400. Three 24-inch-diameter, approximately 5,500-foot-long pipelines would connect the rail car unloading facility to the storage tanks in Area 300; one of these pipes would be electrically heat-traced to maintain the viscosity of the crude oil requiring heating would be maintained while it is conveyed from the unloading facility to the Storage Area. A 36-inch-diameter, approximately 5,300-foot-long pipeline would connect the storage tanks with the vessel loading system in Area 400. A 6-inch-diameter pipeline would return crude oil from the vessel loading system to the storage tanks and also serve as the return line for pressure relief system to prevent pipe hammer.

Aboveground pipe sections would be supported on spread footings located every 35 feet. Vertical expansion loops would be located at key locations along the pipeline and supports for the expansion loops would also be on spread footings. Underground sections of the pipelines would be located in fully sealed, welded casing sections and transition concrete vaults. The aboveground section of the transfer piping which runs parallel with the Columbia River would most likely require ground improvements to comply with current seismic standards.

The transfer pipelines are located predominately in non-exclusive lease areas with the port. Transfer pipelines would be located a minimum of 1 foot above the ground and in cleared and gravel surface corridors to facilitate frequent inspection. Downstream catch basins and drainages would be retrofitted with spill control devices capable of capturing a minimum of 5 gallons of oil.

Construction activities in the area include site preparation, TESC installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, relocation of underground utilities including water and storm drainage, pipeline foundation and ground improvements, pipeline construction, and final site stabilization including gravel surfacing and pavement restoration

Stormwater runoff volumes were calculated using WWHM. During construction, stormwater and excavation dewatering would be excluded from active work areas and stockpiles with plastic sheathing and treated with BMPs. A detailed discussion of the BMPs and monitoring systems used on site is included in section 3.

Table 9 summarizes Area 500 and the WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Area 500 results are included in the Analysis Results as POC 4. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 9. Area 500 - Transfer Pipelines - Site Summary

	Pre-Construction	During Construction	Completed Facility
Total Site Area	4.9 Acres	12.9 Acres	4.9 Acres
Percent Impervious	68.1 %	96.2 %	100 %
Disturbed Area	3.3 Acres	12.4 Acres	4.9 Acres
2-Year Peak Runoff	1.40 cfs	5.11 cfs	2.02 cfs
10-Year Peak Runoff	2.20 cfs	8.01 cfs	3.16 cfs
25-Year Peak Runoff	2.66 cfs	9.66 cfs	3.81 cfs
100-Year Peak Runoff	3.41 cfs	12.37 cfs	4.88 cfs

2.3.5 Area 600 – West Boiler

The West Boiler comprises a boiler building, paved parking and access areas, aboveground steam and condensate piping, and site landscaping. The boiler building would have a footprint of approximately 6,000 square feet and would be approximately 45 feet high. The building would house two primary and one standby natural gas-fired boilers, to provide steam for the heating of tank cars during unloading.

The boiler building, equipment pads, E-house, and pipeline supports would all utilize slab on grade or spread footings. Natural gas, water supply, and wastewater utilities would be extended onto the site to provide service. The stormwater system from Area 200 would be extended to Area 600 for storm drainage.

Construction activities in the area include site preparation, TESC installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, relocation of underground utilities including water and storm drainage, building foundation, building construction, piping and mechanical installation and final site stabilization including site paving and landscaping.

Stormwater runoff volumes were calculated using WWHM. During construction, stormwater and excavation dewatering would be excluded from active work areas and stockpiles with plastic sheathing and treated with BMPs. A detailed discussion of the BMPs and monitoring systems used on site is included in section 3.

Table 10 summarizes Area 600 and the WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Area 600 results are included in the Analysis Results as POC 5. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 10. Area 600 - West Boiler - Site Summary

	Pre-Construction	During Construction	Completed Facility
Total Site Area	0.8 Acres	1.3 Acres	0.8 Acres
Percent Impervious	100 %	100 %	87.5 %
Disturbed Area	0.8 Acres	1.3 Acres	0.7 Acres
2-Year Peak Runoff	0.32 cfs	0.58 cfs	0.31 cfs
10-Year Peak Runoff	0.52 cfs	0.90 cfs	0.48 cfs
25-Year Peak Runoff	0.62 cfs	1.09 cfs	0.58 cfs
100-Year Peak Runoff	0.80 cfs	1.40 cfs	0.75 cfs

2.3.6 Rail Improvements

One additional rail loop would be constructed on approximately 1.80 acres at Terminal 5. In addition, rail infrastructure would be relocated and modified in the west vicinity of the Area 200 rail unloading structure to facilitate the switching and departure of trains. The total area for rail improvements for the facility totals 3.47 acres. The additional rail loop will bring the total number of permitted loop tracks in Terminal 5 to six. The additional rail loop will be constructed as part of the second phase of the project.

The new rail line approximately 4,900 feet long, would be added to the Terminal 5 rail infrastructure. The track would consist of railroad ballast (rock), 115-pound hardened steel rails that are continuously welded and mounted on either 8-foot x 6-inch or 8-foot x 3-inch crossties, and other miscellaneous materials. Crossties would be concrete for the most part, except at crossings where timber would be used. The rails would be continuously welded to reduce noise and increase safety. The rail loops would be designed to comply with railroad and federal requirements.

The corridor that will be used for the additional rail loop is currently portion of a gravel inspection road. The road width will be reduced to 13-feet without modification to the southern extents of the inspection road. Pullouts will be added along the road to allow passing of vehicles along the corridor.

These improvements are anticipated to be located adjacent to the existing corridor for the WVFA project. The existing stormwater drainage systems installed as part of the WVFA project are capable of handling operational stormwater. Minor adjustments to collection systems may be needed depending upon the final location of rail lines. Existing treatment systems and capacities will not be impacted by construction.

Construction activities in the area include site preparation, TESC installation and maintenance, demolition and relocation of existing franchise utilities, rough grading, relocation of underground utilities, including storm drainage, rail construction and final site stabilization including adjacent surface restorations where necessary.

Construction of the rail improvements is not part of the first phase of work for the Vancouver Energy Facility. Construction of the additional loop will be completed based upon long-term capacity of the Terminal 5 rail infrastructure and the future phase of the Facility.

Table 11 summarizes rail improvements and the WWHM results. Detailed stormwater calculations are included in Appendix F for pre-construction and during construction. Rail improvements results are included in the Analysis Results as POC 6. Stormwater calculations for the completed facility are detailed in the facility's Industrial Stormwater Engineering Report.

Table 11. Rail Improvements - Site Summary[3]

	Pre-Construction	During Construction	Completed Facility
Total Site Area	3.5 Acres	3.5 Acres	3.5 Acres
Percent Impervious	100 %	100 %	100 %
Disturbed Area	5.4 Acres	5.4 Acres	5.4 Acres
2-Year Peak Runoff	1.44 cfs	1.44 cfs	1.44 cfs
10-Year Peak Runoff	2.26 cfs	2.26 cfs	2.26 cfs
25-Year Peak Runoff	2.72 cfs	2.72 cfs	2.72 cfs
100-Year Peak Runoff	3.49 cfs	3.49 cfs	3.49 cfs

2.3.7 Construction within Identified Cap Areas

This section is intended to provide detailed descriptions of surface area disruptions within the Deed Restrictive Areas shown in Figure 5. Detailed construction drawings indicating existing cap sections and restoration details are included in Appendix M.

2.3.7.1 Vanexco Cap

The areas of potential contaminates are contained below an existing concrete slab that has been preserved in place and buried with approximately 3 to 4 feet of fill. In areas where the rail corridor has been constructed, portions of the existing concrete slab have been removed and replaced with an impervious liner and drainage system. The combination of liner and concrete slab protects the contaminated material from exposure to stormwater.

A total of approximately 20,000 square feet of improvements is proposed as part of the parking lot and containment storage tanks at the administrative/support building area. Work in this area has been designed utilizing surface features for stormwater collection and conveyance. The amount of fill over the concrete slab allows standard construction techniques for parking lot construction. Spread footings and thickened slabs are proposed for the containment tanks. The bottom of the containment tank footings are proposed at 31.25 feet. The existing concrete cap is at Elevation 31.1 according to as-built drawings.

Construction of the rail unloading building would consist of the installation of 19 column footings and 357 linear feet of grade beam within the cap areas. Existing drawings showing cross sections from the installation of the high-density polyethylene (HDPE) liner indicate that the liner is at an approximate elevation between 28.0 and 28.3 feet. Construction of the footings within the Vanexco Cap would require foundation excavation to an elevation of 26.33 feet.

Portions of the rail unloading facility would occur within the existing HDPE liner. In those locations, this sequence of construction would follow.

1. The fill on top of the liner would be removed carefully to expose the liner and the liner would be rolled back to facilitate construction of the rail unloading facility.
2. Excavated soils from this area would be placed in separate containment bins for testing and clean backfill would be used.
3. The liner would be rolled back into place preserving positive drainage to the existing liner drainage system.
4. The liner would be tied into the grade beam of the facility while the roof and concrete surfacing would maintain the necessary stormwater segregation and the function of the existing cap.

[3] Note that the areas displayed for rail improvements within this construction SWPPP only apply to the additional rail loop being permitted by the Facility and the modifications to existing rail infrastructure to connect into the rail unloading building. The rail infrastructure discussed within the NPDES Engineering Report and Operations SWPPP specifically apply to rail infrastructure that the Facility operates on.

Work within this area would be restricted to periods of dry weather and, if rainfall is forecast, work would be stopped and the disturbed areas covered with plastic sheathing to preserve cap function.

2.3.7.2 North, North 2, SPL, and Ingot Caps

Construction is limited within the North, North 2 Landfills, SPL Storage Area, and Ingot Cap to improvements required by the rail improvements only. Construction of the rail improvements will occur within the limits of the prior project boundary for the Port's WVFA project. Construction of the outermost loop track will require reconfiguration of the inspection/access road. The road width will be reduced to 13 feet to accommodate the outer track. The southern limits of the gravel inspection road will not be adjusted. Construction within these areas would be substantially similar and is proposed to comply with all currently permitted conditions of approval for this work, and minimum cap restoration would be as follows. Complete engineering drawings and updated construction SWPPP will be prepared and submitted to EFSEC prior to construction.

- SPL Cap – This cap has been modified by the Port during expansion of the rail facility. Construction techniques generally use a system of 30-mil PVC membrane installed underneath track ballast and 10 inches of crushed rock. Construction modifications would be tied into the existing asphalt cap areas using concrete transition ties to transition from membranes to asphalt.
- North/North 2 Cap – The cap is protected by native subgrade covered by dredge and selected fill.
- Ingot Cap – The cap is protected by prepared subgrade and selected fill, with a layer of backfilled sand of various depths and 12 inches of crushed concrete.

2.3.7.3 East Landfill

Construction within the east landfill area consists of grading a suitable level bench within the area to construct foundations for the aboveground crude oil pipeline. The actual limits of the landfill areas was surveyed by the port. By design, improvements within this area would not impact the landfill area.

3. Construction Stormwater BMPs

These construction stormwater BMPs have been selected for the proposed project. Detailed environmental control plans for the project are attached in Appendix G. The plans have been designed, unless noted specifically, for wet-weather construction activities. The design of the environmental control plan places a priority on erosion prevention. Sediment controls and stormwater treatment are additionally selected at each project area in the event that erosion does occur.

Specific emphasis is placed in the environmental control plans to protect the surface water quality of nearby wetlands and the Columbia River. Perimeter improvements have been identified for all construction areas, and where ground improvements are necessary, additional perimeter improvements such as temporary berms, cutoff ditches, and/or wick drains have been included.

3.1 The 12 BMP Elements

The BMPs discussed in this section are as specified by Ecology in the *2012 Stormwater Management Manual for Western Washington* (Washington State Department of Ecology 2012). The BMPs must satisfy the requirements set forth in the General NPDES Permit (Appendix I).

To avoid potential issues that may cause a violation(s) of the permit, at the first sign that existing BMPs are ineffective or failing, the Certified Erosion and Sediment Control Lead (CESCL) will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix J. The alternate BMPs are a quick reference tool for the onsite inspector in the event the listed BMPs are deemed ineffective or inappropriate during construction.

3.1.1 Element 1: Preserve Vegetation/Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction would be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, would be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil would be retained in an undisturbed state to the maximum extent possible. The BMPs related to marking the clearing limits that may be used on this project include:

- High Visibility Plastic or Metal Fence (BMP C103)
- Silt Fence (BMP C233)

Table 12 lists the project elements that would require the use of BMPs to preserve vegetation and mark clearing limits.

Table 12. Areas Requiring Vegetation Preservation/Marking and Clearing Limit BMPs

Area	High Visibility Plastic or Metal Fence	Silt Fence
200 – Unloading & Office	Required	Required
300 – Storage	Required	Required
400 – Marine Terminal	Required	Required
500 – Transfer Pipelines	Required	Required
600 – West Boiler	Required	Required
Rail Improvements	Required	Required

High visibility fencing and silt fencing would be used on all areas of the project to delineate the construction boundaries. Where natural vegetation, wetlands, or surface water bodies are adjacent, those areas (regardless of ground slope) would be protected by silt fencing, while silt fencing would be installed in all areas on the downslope gradient of the work areas. High visibility fencing would be used on all upslope gradients of the work areas. All fencing would be held a minimum of 20 feet back from all rail corridors.

3.1.1.1 High-Visibility Plastic or Metal Fence (BMP C103)

Fencing is intended to fulfill the following purposes.

1. Restrict clearing to approved limits.
2. Prevent disturbance of sensitive areas, their buffers, and other areas required to be left undisturbed.
3. Limit construction traffic to designated construction entrances, exits, or internal roads.
4. Protect areas where marking with survey tape may not provide adequate protection.

To establish clearing limits, plastic, fabric, or metal fencing may be used in the following situations.

- At the boundary of sensitive areas, their buffers, and other areas required to be left uncleared.
- As necessary to control vehicle access to and on the site.

3.1.1.2 Silt Fence (BMP C233)

A silt fence is used to reduce the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

Silt fence may be used downslope of all disturbed areas, but the project would follow these Ecology caveats: The fence would prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but would allow the water to pass through the fence. The silt fence would not be used to treat concentrated flows or to treat substantial amounts of overland flow. Any concentrated flows would be conveyed through the drainage system to a sediment pond. Silt fences would not be constructed in

streams or used in V-shaped ditches because in these situations, silt fence does not provide an adequate method of silt control.

3.1.2 Element 2: Establish Construction Access

Construction access or activities occurring on unpaved areas would be minimized, yet where access points are necessary, they would be stabilized to minimize tracking sediment onto public roads, and wheel washing, street sweeping, and street cleaning would be employed to prevent sediment from entering state waters. All wash wastewater would be controlled on site. The specific BMPs related to establishing construction access that may be used on this project include:

- Stabilized Construction Entrance/Exit (BMP 105)
- Wheel Wash (BMP C106)
- Construction Road/Parking Area Stabilization (BMP C107)

Table 13 lists the areas of the project that would require stabilization and/or wheel washing.

Table 13. Areas Requiring Construction Access BMPs

Area	Stabilized Construction Entrance/Exit	Wheel Wash	Construction Road/Parking Area Stabilization
200 – Unloading & Office	Required	Required[1]	Required
300 – Storage	Required	Required[1]	Required
400 – Marine Terminal	Required	Required[1]	Required
500 – Transfer Pipelines	N/A	N/A	N/A
600 – West Boiler	Required	-	Required
Rail Improvements	Required	-	-

Wheel washing for vehicles from within the ground disturbing activity area will be required during excavations with dewatering and during ground improvement activities. A wheel wash will be installed at the staging/laydown area at Area 200 for the duration of ground-disturbing activities if needed.

Delineated construction access points have been established for each project area where ground-disturbing activities exist. Entrance locations are generally placed near the construction laydown and staging areas for each site. Wheel washes would be provided during all ground improvement activities and rough grading. Construction roads/parking areas are provided at each construction laydown/staging area. Detailed descriptions of each area are included below:

Area 200 – Unloading and Office

The primary project laydown and staging area is proposed within the Terminal 5 rail loop. Entrances and exits to the laydown area and construction area for the rail unloading facility would have stabilized construction entrances and wheel wash. Construction road/parking areas would be stabilized per BMP C107 for all parking and regular vehicular traffic areas. A high visibility fence would separate the staging/laydown area from the construction site. All trucks hauling equipment, excavated soils, or backfill material would be required to use the wheel wash at a minimum when exiting the site.

A laydown area is proposed at the location of the future office building in the administration and support area. A construction entrance is proposed adjacent to this in the alignment of the proposed parking area. The construction entrance located at Area 600 to the west would have a wheel wash for material import and haul trucks. It is anticipated that workers in this area would report to the primary laydown/staging area within the Terminal 5 rail loop and private vehicles would not be parked in this area.

Area 300 – Storage

Two construction entrances would be located at Area 300. The primary laydown and staging area would be located on the west end of the project area. This area is predominantly for construction workers, office trailers, and material storage. The entrance on the east side of the project area would include the wheel wash and is designated for excavation haul off, material import, and for concrete truck access. The water quality units and concrete washout facilities for the project are located at the southeast corner, and this entrance would additionally support that facility.

A construction road would be maintained along the south and east portions of the project for vehicles accessing the concrete washout and water quality facilities. Construction workers on this site are anticipated to report to the staging/laydown areas at the west access and construction parking would be provided in that area.

Area 400 – Marine Terminal

The Marine Terminal would use two construction entrances, one on the west end near the current CalPortland lease area and one in alignment with the current waterfront access road on the east end. The primary access into this area would be from the west near the identified staging/laydown area. Office trailers and parking for the workers would be provided. Material hauling would be in/out of this access as well and a wheel wash unit would be provided during ground-disturbing activities.

Area 500 – Transfer Pipelines

The construction of the transfer pipelines would use the project staging and laydown area within the Terminal 5 rail loop (Area 200) for staging, laydown, construction worker parking, and offices. Material stockpiling also would occur in Area 200.

Area 600 – West Boiler

Construction of the West Boiler is assumed to be completed as a second, deferred improvement. This work would include minor grading. As shown, a construction entrance would be constructed and worker parking on the site would be minimal. The remainder of the work for the pipe bridge and the mechanical improvements within the rail unloading building would use staging/laydown within the Terminal 5 loop.

Rail Improvements

The Rail Improvements construction will primarily occur within the existing project footprint for WVFA. The staging and laydown area for the construction will provide a stabilized construction entrance to delineate the location and entrance to the area. It is anticipated that this area will be located adjacent to rail construction and will be used for equipment as well.

3.1.2.1 Stabilized Construction Entrance/Exit (BMP C105)

Construction entrances are stabilized by constructing a pad of quarry spalls at their entrances and exits; this reduces the amount of sediment transported onto paved roads by vehicles or equipment. The following provisions affect the installation and operation of stabilized construction entrances.

- Construction entrances are stabilized wherever traffic enters or leaves a construction site if paved roads or other paved areas are within 1,000 feet of the site.
- Stabilized surfaces should be long and wide enough to provide vehicle access/parking, based on lot size/configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow additional stabilized entrances not shown in the initial construction SWPPP. It is difficult to determine exactly where access to these projects would take place; additional materials will enable the contractor to install them where needed.

3.1.2.2 Wheel Wash (BMP C106)

Wheel washes reduce the amount of sediment transported onto paved roads by motor vehicles and are used when a stabilized construction entrance (see BMP C105) does not prevent sediment from being tracked onto pavement. The following provisions affect the installation and operation of wheel washes.

- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street. Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.
- Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.
- Wheel wash or tire bath wastewater should not include wastewater from concrete washout areas.

3.1.2.3 Construction Road/Parking Area Stabilization (BMP C107)

This BMP involves reducing erosion caused by construction traffic or runoff by stabilizing roads, parking areas, and other on-site vehicle transportation routes immediately after grading.

As the BMP stipulates, whenever roads or parking areas (whether temporary or permanent) are constructed for use by construction traffic, they would be stabilized and high visibility fencing would be installed as required by BMP C103.

3.1.3 Element 3: Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site would be controlled. The specific flow control BMPs that may be used on this project include

- Check Dams (BMP C207)
- Outlet Protection (BMP C209)
- Compost Socks (BMP C235)
- Storage/Surge Tanks/Sediment Pond (Custom BMP)

Table 14. Areas Requiring Control Flow Rate BMPs

Area	Check Dams	Outlet Protection	Compost Sock	Storage/Surge Tanks
200 – Unloading & Office	Required	N/A	-	450,000 gallons Required
300 – Storage	N/A	N/A	-	250,000 gallons Required
400 – Marine Terminal	N/A	Required	Required	40,000 gallons Required
500 – Transfer Pipelines	N/A	N/A	Required	N/A
600 – West Boiler	N/A	N/A	Required	N/A
Rail Improvements	N/A	N/A	N/A	N/A

Flow control elements are identified for each construction area. The flow control is not intended to provide for detention requirements. The existing condition on site is considered to be fully impervious as a result of decades of industrial activity. Flow control is designed to maintain safe conveyance of construction stormwater, and surge protection to verify water quality treatment benchmarks are achieved.

The Stormwater Management Manual for Western Washington (SMMWW) specifies that upstream tankage required for the use of construction stormwater filtration or chemical treatment is 1.5 times the 10-year, 24-hour storm volume minus 8 hours of the provided treatment system flow rate. For this project,

the construction stormwater monitoring and treatment systems are designed with redundancy on-site and on-call personnel 24 hours a day. As such, the calculations for required tankage use an expanded 20-hour-a-day treatment period. The table above specifies the required tankage volume as determined by the modified sizing criteria specified in BMP C251 for flow control exempt water bodies. The tankage volumes above correlate to the treatment capacities specified in section 3.1.5.

Area 200 – Unloading and Office

Construction at the unloading and office area is not anticipated to have a significant impact on stormwater runoff. Silt fence would be installed along the southern boundary and ground-disturbing activities would be sequenced to, at a minimum, install the gravel surfacing immediately following grading. Runoff from this area would continue along the existing drainage patterns sheet flowing to the south.

Construction of the rail unloading building would require deep excavations for the pump pits and excavations within the Vanexco Cap. Excavation dewatering from these areas would be removed from the excavation and pumped into a storage/weir tank located to the south of the rail unloading building. This groundwater would be isolated from the remainder of the construction stormwater system, and would be tested for contaminates of concern. If testing for contaminates is negative or below surface water quality standards, the water would be released into the construction stormwater system for treatment and discharge. If tests are positive, the contaminated water would be removed from the site from a licensed disposal company for treatment and legal disposal.

Construction stormwater from the rail unloading building area will be intercepted by interceptor swales and pumped into weird tanks for treatment. The staging/laydown areas would be collected in the existing stormwater system. The staging/laydown activities for the project are consistent with the existing use of the inner Terminal 5 loop. Monitoring of the stormwater from the staging/laydown area will be conducted; and if stormwater from the staging/laydown area needs to be rerouted or receive additional treatment to comply with NPDES permit conditions treated, a cutoff ditch with check dams would be installed and directed towards existing inlets or a new sump with pump to direct stormwater to the on-site weir tanks. The downstream portion of this system would be plugged, and stormwater would be pumped out of the system and discharged into weir tanks for flow control, followed by an enhanced sand filter system as described in section 3.1.5.

Construction within the Vanexco cap area will be restricted to working periods without precipitation. The site will be covered, and runoff will be directed toward the remainder of the facility or collected in the existing storm drainage system above the contaminated media.

Area 300 – Storage

Construction stormwater within Area 300 would be directed through constructed cutoff ditches, sumps, and pumped to on-site weir tanks. The weir tanks would provide initial settling of large sediment and attenuate surges of stormwater. Stormwater following the tanks would be processed through enhanced sand filtration as described in section 3.1.5.

Area 400 – Marine Terminal

The Marine Terminal would be graded to drain into the bio-infiltration swales using a media filter drain for water quality. Runoff into the area would be controlled through compost socks installed along the slope. Compost socks also would be installed along the slope of the river embankment to protect the slope from erosion. Additionally, during ground improvements, any groundwater or jet water used and brought to the surface would be collected and pumped into weir tanks. Enhanced sand filtration for water quality treatment follows downstream of the weir tanks.

Area 500 – Transfer Pipelines

Ground disturbance of the transfer pipelines consists largely of foundation excavations. These areas would be surrounded by compost socks to control runoff flow rates. Excavations within this area would be temporary and exposed for only a short time.

Area 600 – West Boiler

The downslope portions of the West Boiler and the utility excavations to the site would use compost socks to control runoff. Excavations within this area would be temporary and exposed for a short time.

Rail Improvements

The majority of construction stormwater from the rail corridor is expected to runoff to the existing conveyance system. Additionally, the Columbia River is a flow control exempt waterbody according to Ecology's SMMWW Volume I. In the event that stormwater is not captured and flow control is needed, flow control devices specified below or in Appendix J may be necessary.

3.1.3.1 Check Dams (BMP C207)

A small dam constructed across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam. Check dams are used where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and/or velocity checks are required. The following provisions affect the use of this BMP.

- Check dams may not be placed in streams unless approved by the Washington Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Do not place check dams below the expected backwater from any salmonid bearing water between October 1 and May 31 to provide for no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.
- Construct rock check dams from appropriately sized rock. The rock used must be large enough to stay in place given the expected design flow through the channel. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to verify that the center of the dam is lower than the edges.
- Check dams may also be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Place check dams perpendicular to the flow of water.
- The dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom. Before installing check dams impound and bypass upstream water flow away from the work area. Options for bypassing include pumps, siphons, or temporary channels.
- Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.
- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2H:1V or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.
- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, filter fabric is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.

- Verify that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure 4.2.7 depicts a typical rock check dam.

3.1.3.2 Outlet Protection (BMP C209)

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows. Outlet protection is required at the outlets of all ponds, pipes, ditches, or other conveyances, and where runoff is conveyed to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

3.1.3.3 Compost Sock (BMP C235)

Wattles are TESC barriers consisting of straw, compost, or other material that is wrapped in biodegradable tubular plastic or similar encasing material. Wattles reduce the velocity of stormwater and can spread the flow of rill and sheet runoff and can capture and retain sediment. Typical wattles are 8 to 10 inches in diameter and 25 to 30 feet long. Wattles are placed in shallow trenches and staked along the contour of disturbed or newly constructed slopes. See Figure 4.2.14 for typical construction details. WSDOT Standard Plan I-30.30-00 also provides information on wattles (http://www.wsdot.wa.gov/Design/Standards/Plans.htm#SectionI).

This BMP stipulates the use of wattles in the following circumstances.

- In disturbed areas that require immediate erosion protection.
- On exposed soils during the period of short construction delays, or over winter months.
- On slopes requiring stabilization until permanent vegetation can be established.

The material used dictates the effectiveness period of the wattle, but they usually are effective for one to two seasons. Riling beneath wattles can be prevented by properly entrenching and abutting them to prevent water from passing between them.

3.1.3.4 Storage/Surge Tanks (Custom BMP)

Storage/Surge tanks are used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin. Tanks remove sediment from runoff originating from disturbed areas of the site. The tanks are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, tanks usually reduce turbidity only slightly. This BMP stipulates that, before stormwater runoff leaves a construction site, the runoff must pass through a sediment pond, storage/surge tank, or other appropriate sediment removal BMP. Sediment ponds are used where the contributing drainage area is 3 acres or more.

3.1.4 Element 4A: Install Sediment Controls

All stormwater runoff from disturbed areas would pass through an appropriate sediment removal BMP before leaving the construction site or before the discharge of the stormwater to an infiltration facility. The specific sediment control BMPs that may be used on this project include:

- Silt Fence (BMP C233)
- Compost Sock (BMP C235)

Table 15. Areas Requiring Sediment Control BMPs

Area	Silt Fence	Compost Sock
200 – Unloading & Office	Required	Required
300 – Storage	Required	-
400 – Marine Terminal	Required	Required
500 – Transfer Pipelines	Required	Required
600 – West Boiler	Required	Required
Rail Improvements	Required	Required

Area 200 – Unloading and Office

Sediment controls at Area 200 would consist of silt fencing installed along the downslope project areas. On slopes or where localized excavations occur within the 20-foot rail clearance area, compost socks would be used.

Area 300 – Storage

Sediment controls at Area 300 would consist of silt fencing installed along all downslope project areas.

Area 400 – Marine Terminal

Sediment controls at Area 400 would consist of silt fencing installed along all downslope project areas and along the top of bank. Compost socks would be installed along the embankment and along the media filter drain.

Area 500 – Transfer Pipelines

Silt fencing would be installed along the top of bank where the transfer pipelines and ground improvements are constructed along the river. Compost socks would be used to protect downslope areas from localized foundation excavation runoff. Additionally, compost socks would be installed along river embankment.

Area 600 – West Boiler

Sediment controls would consist of silt fencing installed along all downslope project areas.

Rail Improvements

Silt fencing and straw wattles will be used to intercept stormwater as is flows from the construction site. Sediment controls will be installed along all downslope project areas.

3.1.4.1 Silt Fence (BMP C233)

Section 3.1.1.2 discusses silt fence.

3.1.4.2 Compost Socks (BMP C235)

Section 3.1.3.3 describes compost socks.

3.1.4.3 Additional Measures to Control Sediment Discharge

In addition, sediment would be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize wash off of sediments from adjacent streets in runoff.

Whenever possible, sediment-laden water would be discharged into relatively level, vegetated areas of the project site (BMP C240 paragraph 5, page 4-102).

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs are used to control sediment discharge during construction, the structure would be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment would be removed after construction is complete and, once the remainder of the site has been stabilized, the permanent stormwater BMP would be restabilized with vegetation per applicable design requirements.

3.1.5 Element 4B: Turbidity Control BMPs

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls. The specific turbidity control BMPs that may be used on this project include

- Weir Tanks (Custom BMP)
- Construction Stormwater Chemical Treatment (BMP C250)
- Construction Stormwater Filtration (BMP C251)
- Wick Drains (Custom BMP)

Table 16. Areas Requiring Turbidity Control BMPs

Area	Weir Tanks	Chemical Treatment	Filtration	Wick Drains
200 – Unloading & Office	2 Tanks Required	750 gpm Required	750 gpm Required	-
300 – Storage	2 Tanks Required	2,500 gpm Required	2,500 gpm Required	Required
400 – Marine Terminal	-	250 gpm Required	250 gpm Required	Required
500 – Transfer Pipelines	-	-	-	Required
600 – West Boiler	-	-	-	-
Rail Improvements	-	-	-	-

The required treatment flow rates indicated above were selected based upon sizing criteria for upstream tankage specified in BMP C250 of the SMMWW. The flow rates above are minimum flow rates that generally conform to standard intervals of available units within the industry. The flow rate of 5,000 gpm was selected at Area 200 to keep downstream conveyance systems from being overloaded. The flow rates also assume that the treatment systems will operate for 16 hours a day during the 10-year, 24-hour design storm.

The Port conducted water quality sampling during two storms in 2013. The full results of this report are located in Appendix K. Construction activity was underway during the testing period at Farwest Steel (Parcel 1A). The results of this testing are used as the basis of design for the Facilities Turbidity Control

BMPs. The results of the sampling and the resultant assumed basis of design are summarized in Table 17 below.

The basis of design assumes higher than the sampled average for turbidity to conservatively design the proposed filtration systems can adequately handle construction runoff from the Facility. The highest value of 500 was not used as the basis of design because the treatment train of construction BMPs includes pretreatment with surge/storage tanks and weir tanks prior to the filtration processes required.

The sample point of 270 mg/L for total suspended solids (TSS) is suspect as no other sampling indicated levels to this degree. The other highest TSS in the report was 55 mg/L from runoff of an adjacent parking lot/paved laydown area. The geotechnical report attached in Appendix D characterizes the Facility areas as predominately sands, which will have a much larger particle size and resulting lower TSS. A design value of 100 mg/L is considered adequate, especially with the construction BMP treatment train with upstream surge/storage tanks and weir tanks.

Table 17. Construction Turbidity Control Sampling and Basis of Design

Parameter	Sampling Data			Basis of BMP Selection and Design
	28 January 2013	28 February 2013	Average	
Turbidity (NTU)	196.1	500	348.05	400
TSS (mg/L)	34.0	270	152	100

Areas 200, 300, and 400

Construction stormwater from Area 200 would be collected and stored in weir tanks for initial sediment settling. Stormwater from the weir tanks would overflow and be processed through sand filtration. The sand filters would be equipped for the addition of chemical treatment (flocculent) to additionally provide higher levels of treatment when needed. All water resulting from ground improvements would be processed through chemical treatment BMPs.

Construction dewatering and groundwater removed from the Environmental Restrictive Covenant areas will be segregated from surface water runoff and will be tested and treated as discussed in section 3.1.11.

Areas 500 and 600

Turbidity controls are not required at areas 500 and 600. BMPs for sediment control and erosion prevention would be strictly enforced to reduce turbidity loading in the downstream stormwater system.

Rail Improvements

Turbidity controls for the rail improvements may include use of permanent stormwater controls, such as downstream ponds and trenches. Sediment deposited in these BMPs will be removed. Alternative BMPs are listed in in Appendix J if needed.

Ground Improvements

Wick drains will be used between areas of ground improvement (stone columns, soil mixing, jet grouting, etc.) and surface waters and wetlands. At Area 300, wick drains will be installed at a minimum of 16 feet on center where ground improvements are within 150 feet of the adjacent wetlands to the north and east. At areas 400 and 500, wick drains will be installed along the top of bank at 8 feet on center for the entire bank area receiving ground improvement. Visual monitoring of turbidity within the wetlands or Columbia River will occur daily during ground improvement. If any turbidity is observed as a result of ground improvement, ground improvement activities will be stopped and additional mitigation measures will be installed, including additional wick drains, turbidity curtains, or change in ground improvement methods will be considered.

3.1.5.1 Weir Tanks (Custom BMP)

Weir tanks are used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin. Tanks remove sediment from runoff originating from disturbed areas of the site. The tanks are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, tanks usually reduce turbidity only slightly. This BMP stipulates that, before stormwater runoff leaves a construction site, the runoff must pass through a sediment pond, weir tank, or other appropriate sediment removal BMP. Sediment ponds/weir tanks are used where the contributing drainage area is 3 acres or more.

3.1.5.2 Construction Stormwater Chemical Treatment (BMP C250)

This BMP applies when using stormwater chemicals in batch treatment or flow-through treatment.

Turbidity is difficult to control once fine particles have become suspended in stormwater runoff from a construction site. Sedimentation ponds are effective at removing larger particulate matter by gravity settling, but are ineffective at removing smaller particulates such as clay and fine silt.

Traditional erosion and sediment control BMPs may not be adequate to maintain compliance with the water quality standards for turbidity in receiving water.

Chemical treatment can reliably provide exceptional reductions of turbidity and associated pollutants. Chemical treatment may be required to meet turbidity stormwater discharge requirements, especially when construction is to proceed through the wet season.

Ecology must provide formal written approval for the use of chemical treatment regardless of the size of the site. The local permitting authority may also require review and approval. After the use of the chemical treatment system has been approved, it must be included in the construction SWPPP.

3.1.5.3 Construction Stormwater Filtration (BMP C251)

Filtering stormwater from construction removes the sediment from runoff that originates from the areas of the site that have been disturbed.

Filtration with sand media has been used for over a century to treat water and wastewater. Using sand filtration to treat stormwater is more recent and is generally used to treat runoff from streets, parking lots, and residential areas. The application of filtration to treating construction stormwater is currently under development.

Traditional BMPs used to control soil erosion and sediment loss from sites under development may not be adequate to maintain compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5 µm). The reduction in turbidity would depend on the particle sizes in the sediment in the stormwater. In some circumstances, sedimentation and filtration may achieve compliance with the water quality standard for turbidity.

The use of construction stormwater filtration does not require approval from Ecology as long as treatment chemicals are not used. Filtration in conjunction with polymer treatment requires testing under the Chemical Technology Assessment Protocol before it can be initiated. If the use of polymers is proposed, approval from the appropriate regional Ecology office must be obtained beforehand. For more guidance on the chemical treatment of stormwater, see BMP C250 in section 3.1.5.2.

3.1.6 Element 5: Stabilize Soils

Exposed and unworked soils would be stabilized throughout the life of the project by the application of BMPs that are effective in preventing erosion. The specific soil stabilization BMPs that may be used on this project include

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Plastic Covering (BMP C123)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)

Table 18. Areas Requiring Soil Stabilization BMPs

Area	Temporary and Permanent Seeding	Mulching	Plastic Covering	Surface Roughening	Dust Control
200 – Unloading & Office	Required	-	Required	-	Required
300 – Storage	Required	-	Required	Required	Required
400 – Marine Terminal	Required	Required	Required	-	Required
500 – Transfer Pipelines	N/A	Required	-	-	Required
600 – West Boiler	Required	-	-	-	Required
Rail Improvements	-	-	Required	-	Required

Area 200 – Unloading and Office

Landscaping areas would be mulched or permanently seeded as soon as the area is graded. Stockpiles in the construction and laydown areas would be covered when not in active use. Dust control measures would be in place for use when needed.

Area 300 – Storage

Landscaping areas would be mulched or permanently seeded as soon as the area is graded. Stockpiles in the construction and laydown areas would be covered when not in active use. Side slopes of the containment area berm would be roughened according to BMP C130 and seeded as soon as possible. Dust control measures would be in place for use when needed.

Area 400 – Marine Terminal

Landscaping areas would be mulched or permanently seeded as soon as the area is graded. All exposed slopes and surfaces in the Marine Terminal area would be mulched. Stockpiles in the construction and laydown areas would be covered when not in active use. Dust control measures would be in place for use when needed.

Area 500 – Transfer Pipelines

All exposed soils in the transfer pipeline area would be mulched, and mulching will be placed to stabilize exposed soils. Where applicable, erosion control seeding also would be completed. The primary surfacing in this area is gravel and gravel would be placed following construction of the foundations. Dust control measures would be in place for use when needed.

Area 600 – West Boiler

Landscaping areas would be mulched or permanently seeded as soon as the area is graded. Dust control measures would be in place for use when needed.

Rail Improvements

Plastic covering will be used to provide immediate and short-term erosion for stockpiles and exposed areas. Dust control measures will be used to prevent wind transport of disturbed soils.

3.1.6.1 Temporary and Permanent Seeding (BMP C120)

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

The BMP stipulates the use of seeding throughout the project on disturbed areas that have reached final grade or that are to remain unworked for more than 30 days. The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. Between July 1 and August 30, the BMP requires irrigation until 75 percent grass cover is established. Between October 1 and March 30, seeded areas must be covered with mulch or an erosion control blanket until 75 percent grass cover is established.

The BMP also requires reviewing all disturbed areas in late August to early September and completing all seeding by the end of September; this is so the vegetation can become well enough established to provide more than average protection.

- Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching below for specifications.
- Seed and mulch all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil-disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions or geotextiles) which will prevent erosion.

3.1.6.2 Mulching (BMP C121)

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. An enormous variety of mulches is available. This section discusses only the most common types. The BMP suggests using mulch as a temporary cover measure as follows.

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.
- For seeded areas mulch may be made up of 100 percent: cottonseed meal; fibers made of wood, recycled cellulose, hemp, kenaf; compost; or blends of these. Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as polyacrylamide or polymers. Any mulch or tackifier product used must be installed per manufacturer's instructions. Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at the time of application.

3.1.6.3 Plastic Covering (BMP C123)

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas. The BMP stipulates that plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.

- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. Note: The relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for long-term (greater than six months) applications.
- Due to rapid runoff caused by plastic covering, do not use this method upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Plastic sheeting may result in increased runoff volumes and velocities, requiring additional on-site measures to counteract the increases. Creating a trough with wattles or other material can convey clean water away from these areas.

- To prevent undercutting, trench and backfill rolled plastic covering products.
- While plastic is inexpensive to purchase, the added cost of installation, maintenance, removal, and disposal make this an expensive material, up to $1.50-2.00 per square yard.
- Whenever plastic is used to protect slopes install water collection measures at the base of the slope. These measures include plastic covered berms, channels, and pipes used to covey clean rainwater away from bare soil and disturbed areas. Do not mix clean runoff from a plastic covered slope with dirty runoff from a project.
- Other uses for plastic include:
  - Temporary ditch liner.
  - Pond liner in temporary sediment pond.
  - Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored.
  - Emergency slope protection during heavy rains.
  - Temporary drainpipe ("elephant trunk") used to direct water.

3.1.6.4 Surface Roughening (BMP C130)

Surface roughening helps the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and traps sediment. A tiller or other suitable equipment is used on the contour to create horizontal depressions or slopes are left in a roughened condition by not fine grading them. This BMP is used in conjunction with others such as seeding, mulching, or sodding. The following conditions are stipulated for the use of this BMP.

- All slopes steeper than 3H:1V and greater than 5 vertical feet require surface roughening to a depth of 2 to 4 inches prior to seeding.
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

3.1.6.5 Dust Control (BMP C140)

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters. Dust control is used in areas (including roadways) that are subject to surface and air movement of dust where on-site and off-site impacts to roadways, drainage ways, or surface waters are likely.

The project site is located west of the crest of the Cascade Mountains. Therefore, no soils will remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils would be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, as part of dust control, cut and fill slopes would be stabilized as soon as possible and soil stockpiles would be covered temporarily with plastic sheeting. All stockpiled soils would be stabilized to prevent erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.7 Element 6: Protect Slopes

All cut and fill slopes would be designed, constructed, and protected in a manner than minimizes erosion. The specific slope protection BMPs that may be used on this project include:

- Surface Roughening (BMP C130)
- Silt Fence (BMP C233)
- Compost Socks (BMP C235)

Table 19. Areas Requiring Slope Protection BMPs

Area	Surface Roughening	Silt Fence	Compost Sock
200 – Unloading & Office	-	-	-
300 – Storage	Required	-	-
400 – Marine Terminal	-	Required	Required
500 – Transfer Pipelines	-	-	-
600 – West Boiler	-	-	-
Rail Improvements	-	-	-

Area 300 – Storage

Slopes constructed for the containment area would be stabilized initially with surface roughening. The exterior of the slope would be permanently seeded and the interior of the containment area would be surfaced with granular surfacing.

Area 400 – Marine Terminal

Silt fencing would be installed along the top of the bank. The upland areas would be graded toward the bio-infiltration swales and away from the bank. Where the bank is not hardscaped with riprap slope protection, compost socks would be installed above the water level to protect slopes during construction.

Area 500 – Transfer Pipelines

There are no slopes within this Facility area; therefore, slope protection BMPs are not applicable.

Area 600 – West Boiler

There are no slopes within this Facility area; therefore, slope protection BMPs are not applicable.

Rail Improvements

There are no slopes within this Facility area; therefore, slope protection BMPs are not applicable.

3.1.7.1 Surface Roughening (BMP C130)

See description of surface roughening in section 3.1.6.4.

3.1.7.2 Silt Fence (BMP C233)

See description of silt fence in section 3.1.4.1.

3.1.7.3 Compost Sock (BMP C235)

See description of compost socks in section 3.1.3.3.

3.1.8 Element 7: Protect Drain Inlets

All storm drain inlets and culverts made operable during construction would be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water from entering storm drains until treatment can be provided. Storm drain inlet protection (BMP C220) would be implemented for all drainage inlets and culverts that could be impacted by sediment-laden runoff on and near the project site.

Table 20. Areas Requiring Storm Drain Inlet Protection BMPs

Area	Storm Drain Inlet Protection
200 – Unloading & Office	Required
300 – Storage	Required
400 – Marine Terminal	Required
500 – Transfer Pipelines	Required
600 – West Boiler	Required
Rail Improvements	Required

All Areas

All storm drain inlets within 500 linear feet of the facility, construction boundary, or laydown areas would receive inlet protection. Inlet protection would be the type indicated in the environmental control plan required for each type of inlet.

Storm drain inlet protection devices will be maintained for the duration of construction activities. Routing of collected stormwater downstream varies by site area, construction methods, and whether the work area is located within or nearby areas of known soil and groundwater contamination. Details regarding downstream stormwater routing and additional treatment are included in sections 3.1.5, 3.1.10, and 3.1.11.

3.1.8.1 Storm Drain Inlet Protection (BMP C220)

Storm drain inlet protection prevents coarse sediment from entering drainage systems prior to the permanent stabilization of the disturbed area. Storm drain inlet protection would be used at inlets that are operational before permanent stabilization of the disturbed drainage area. Protection would be provided for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless runoff entering catch basins is conveyed to a sediment pond or trap.

Table 21 lists several options for inlet protection (Volume II – Construction Stormwater Pollution Prevention - August 2012, page 4-80). All of these methods tend to plug and require frequent maintenance. Drainage areas would be limited to one acre or less. Where stormwater ponding would cause a hazard, emergency overflows with additional end-of-pipe treatment can be provided if appropriate.

Table 21. Types/Conditions of Use of Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated Drop Inlet Protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area. Requirement: 30' X 30'/acre
Block and Gravel Drop Inlet Protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and Wire Drop Inlet Protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch Basin Filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb Inlet Protection with a Wooden Weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and Gravel Curb Inlet Protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet sediment trap			18-month expected life

3.1.9 Element 8: Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels, or discharged to a stream or some other natural drainage point, efforts would be made to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that may be used on this project include the following.

- Channel Lining (BMP C202)
- Check Dams (BMP C207)
- Outlet Protection (BMP C209)

Table 22. Areas Requiring Channel and Outlet Stabilization BMPs

Area	Cutoff Channel Design Flowrate	Channel Lining	Check Dams	Outlet Protection
200 – Unloading & Office	23.3 cfs	Required	Required	-
300 – Storage	12.3 cfs	Required	Required	-
400 – Marine Terminal	-	-	-	Required
500 – Transfer Pipelines	-	-	-	-
600 – West Boiler	-	-	-	-
Rail Improvements	-	-	-	-

Cutoff swales for the facility were designed to convey the 25-year peak runoff flow rate. A gravel-lined swale was assumed using a manning's coefficient of 0.035. Calculations showed that a standard cutoff swale for the facility would be used. Additionally, it was assumed that each of the above areas requiring

cutoff channels would direct construction runoff to a minimum of two swales. The cutoff channel, when necessary, should be a minimum of 1.5 feet wide, with 3H:1V side slopes and be a minimum 1 foot deep. Cutoff channels will use channel lining and check dams to protect against erosion of the swale. Anticipated velocities at a minimum 1 percent slope are approximately 3.5 feet per second.

Areas 200 and 300

Cutoff channels would be installed along the downslope construction area to capture construction stormwater where existing site grading is insufficient to direct stormwater into conveyances for the construction stormwater. These channels would also be used to contain ground improvement runoff where necessary. Channel lining and check dams would be used to protect channel from erosion, and check dams to assist in flow control.

The construction laydown area south of the facility construction area will be unaltered by the project. The facility will use this area for staging and storage of materials. Surface water will be conveyed to stormwater inlets and discharged to the Terminal 5 lagoon to the west. Surface water that does not reach the conveyance system will be infiltrated as-is in the current condition.

Area 400 – Marine Terminal

The discharge from the stormwater treatment system would discharge into the bio-filtration swale. This would provide additional treatment prior to infiltration. Outlet protection would be installed to diffuse concentrated runoff and maintain existing vegetation.

Area 500 – Transfer Pipelines

There are no channels or outlets requiring BMPs in this area.

Area 600 – West Boiler

There are no channels or outlets requiring BMPs in this area.

Rail Improvements

Stormwater within the rail improvement corridor is conveyed to stormwater inlets and discharged to the Terminal 5 lagoon to the west. Surface water that does not reach the stormwater conveyance systems is assumed to infiltrate on site and through the rail ballast.

3.1.9.1 Channel Lining (BMP C202)

Channels can be protected by using either blankets or riprap as channel liners. Channel lining can be used as follows.

- When natural soils or vegetated stabilized soils in a channel are not adequate to prevent channel erosion.
- When a permanent ditch or pipe system is to be installed and a temporary measure is needed.
- In almost all cases, synthetic and organic coconut blankets are more effective than riprap for protecting channels from erosion. Blankets can be used with and without vegetation. Blanketed channels can be designed to handle any expected flow and longevity requirement. Some synthetic blankets have a predicted life span of 50 years or more, even in sunlight.
- Other reasons why blankets are better than rock include the availability of blankets over rock. In many areas of the state, rock is not easily obtainable or is very expensive to haul to a site. Blankets can be delivered anywhere. Rock requires the use of dump trucks to haul and heavy equipment to place. Blankets usually only require laborers with hand tools, and sometimes a backhoe.
- The Federal Highway Administration recommends not using flexible liners whenever the slope exceeds 10 percent or the shear stress exceeds 8 pounds per square foot.

3.1.9.2 Check Dams (BMP C207)

Section 3.1.3.1 describes check dams.

3.1.9.3 Outlet Protection (BMP C209)

Section 3.1.3.2 describes outlet protection.

3.1.10 Element 9: Control Pollutants

All pollutants, including waste materials and demolition debris, that occur on site will be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventive measures will keep the site clean, well-organized, and free of debris. The BMPs that would be implemented to control specific sources of pollutants in the various project areas are shown in the following table and discussed below.

Table 23. Areas Requiring Pollutant Control BMPs

Area	Concrete Handling	Sawcutting and Surface Pollution Protection	Material Delivery, Storage and Containment	Concrete Washout Area	Chemical Filtration	Filtration	pH Neutralization
200 – Unloading & Office	Required	Required	Required	-	Required	Required	-
300 – Storage	Required	Required	Required	Required	Required	Required	Required
400 – Marine Terminal	Required	Required	Required	-	Required	Required	-
500 – Transfer Pipelines	Required	-	-	-	-	-	-
600 – West Boiler	Required	Required	Required	Required	-	-	-
Rail Improvements	Required	Required	Required	Required	-	-	-

The above pollutant control table indicates in which areas pollutants of specific concern need to be addressed. Areas 200, 300, and 400 are of greatest concern to this construction SWPPP as they are the primary areas for laydown and storage of construction equipment and materials. Concrete washout facilities are being provided for the entire facility at Area 300. As a result, pH neutralization also would occur there. Washout water would be discharged to sanitary sewer. Higher levels of pollutant control through filtration and chemical filtration would occur at the major work sites, including areas 200, 300, and 400.

The Port conducted water quality sampling for two storms during 2013. The full results of this report are located in Appendix K. Construction activity was underway during the testing period at Farwest Steel. The results of this testing are used as the basis of design for the Facilities Turbidity Control BMPs. The results of the sampling and the resultant assumed basis of design are summarized in Table 24 below.

The basis of design for the pollutant parameters below were selected based upon the average observed during prior construction activities. The basis of design values were rounded up slightly to provide additional conservatism. Higher than average levels of zinc are not anticipated as the existing galvanized fencing on the facility site will be removed as part of construction. Additionally, no known sources of copper concentrations are known to occur on site.

Table 24. Construction Pollutant Control Basis of Design

Parameter	Sampling Data			Basis of BMP Selection and Design
	28 January 2013	28 February 2013	Average	
Total Cu (µg/L)	27.3	57	42.2	45.0
Dissolve CU (µg/L)	3.5	4.5	4.0	4.0
Total Zn (µg/L)	64.6	170	117.3	120.0
Dissolved Zn (µg/L)	<4.0	<4.0	<4.0	<4.0

Additional pollutants have been categorized on site within the Deed Restrictive Areas (see Figure 5). Excavations within and adjacent to these areas would proceed with a separate discharge location for excavation dewatering as described in section 3.1.11.

3.1.10.1 Concrete Handling (BMP C151)

Concrete work can generate process water and slurry that contain fine particles and high pH, both of which can violate water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the state is prohibited. This BMP would be used to minimize and eliminate concrete, concrete process water, and concrete slurry from entering waters of the state. These management practices would be used whenever concrete is used, such as in the following situations.

- Curbs
- Sidewalks
- Foundations
- Floors
- Marine Structures

3.1.10.2 Sawcutting and Surface Pollution Protection (BMP C152)

Sawcutting and surfacing operations generate slurry and process water that contain fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to surface waters of the state is prohibited. Containment wattles or compost socks should be placed on the downslope side of work, and all slurry and debris resulting from this work shall be removed via vacuum from the construction area, and legally disposed of.

This BMP would be used to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the state whenever sawcutting or surfacing operations take place. The following situations are among those when this BMP should be used.

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

3.1.10.3 Material Delivery, Storage, and Containment (BMP C153)

The discharge of pollutants to the stormwater system or watercourses can result from the delivery and/or storage of material. This BMP is intended to prevent, reduce, or eliminate the discharge of pollutants, and to implement it, the storage of hazardous materials on site would be minimized, the potentially hazardous materials would be stored in a designated area, and secondary containment would be installed.

Ecology specifies the use of this BMP at all construction sites with delivery and storage of the following materials.

- Petroleum products such as fuel, oil and grease
- Soil stabilizers and binders (e.g., polyacrylamide)
- Fertilizers, pesticides and herbicides
- Detergents
- Asphalt and concrete compounds
- Hazardous chemicals such as acids, lime, adhesives, paints, solvents and curing compounds
- Any other material that may be detrimental if released to the environment

3.1.10.4 Concrete Washout Area (BMP C154)

Performing washout off site, or installing a washout area off site, prevents or reduces the discharge of pollutants to stormwater from concrete waste and prevents pollutants from entering surface waters or ground water.

Ecology specifies the use of concrete washout area BMPs on construction projects where:

- Concrete is used as a construction material
- It is not possible to dispose of all concrete wastewater and washout off-site (ready mix plant, etc.).
- Concrete trucks, pumpers, or other concrete coated equipment are washed on site.
- Note: If less than 10 concrete trucks or pumpers need to be washed out on site, the wash water may be disposed of in a formed area awaiting concrete or an upland disposal site where it will not contaminate surface or ground water. The upland disposal site must be at least 50 feet from sensitive areas such as storm drains, open ditches, or water bodies, including wetlands.

3.1.10.5 Construction Stormwater Chemical Filtration (BMP C250)

Section 3.1.5.1 describes construction stormwater chemical filtration.

3.1.10.6 Construction Stormwater Filtration (BMP C251)

Section 3.1.5.3 describes construction stormwater filtration.

3.1.10.7 Control for High pH Water (BMP C253)

A pH level range of 6.5 to 8.5 is typical of most natural watercourses, and this pH range is required for the survival of aquatic organisms. Should the pH rise or drop out of this range, fish and other aquatic organisms may become stressed and may die. When pH levels in stormwater rise above 8.5, they must be lowered to the acceptable range of 6.5 to 8.5 through pH neutralization.

High pH levels at construction sites are most commonly caused by the contact of stormwater with poured or recycled concrete, cement, mortars, and other Portland cement or lime containing construction materials. (Section 3.1.10.1 of BMP C151 discusses concrete handling.) The principal caustic agent in cement is calcium hydroxide (free lime).Stormwater with pH levels exceeding water quality standards may be treated by infiltration, dispersion in vegetation or compost, pumping to a sanitary sewer, disposal at a permitted concrete batch plant with pH neutralization capabilities, or carbon dioxide sparging. Additional Ecology guidelines regarding carbon dioxide sparging are discussed in BMP C252 included in Appendix J and an alternative BMP.

3.1.11 Element 10: Control Dewatering

BMPs may be required to control dewatering. If that is the case, the BMPs that may be implemented include

- Construction Stormwater Chemical Filtration (C250)
- Construction Stormwater Filtration (C251)
- Weir Tanks (Custom BMP)

Table 25. Areas Requiring Dewatering Control BMPs

Area	Construction Stormwater Chemical Filtration	Construction Stormwater Filtration	Weir Tanks
200 – Unloading & Office	Required	Required	Required
300 – Storage	Required	Required	Required
400 – Marine Terminal	Required	Required	Required
500 – Transfer Pipelines	-	-	-
600 – West Boiler	-	-	-
Rail Improvements	-	-	-

Pollutant loadings for dewatering are assumed to be consistent with the runoff assumptions used in Sections 3.1.5 and 3.1.10. For construction excavations and dewatering within the environmental restrictive covenant areas, dewatering and groundwater will need to be stored in separate systems.

Stormwater or groundwater removed from these excavations would be pumped into a separate system of storage tanks. Stormwater generated in construction areas with known soil and groundwater contamination will be collected, treated, and disposed in accordance with an Individual Construction Stormwater NPDES permit. When full, the tanks would be tested for water quality, and if the water quality meets the surface water quality limits, the stormwater would be released into the construction stormwater system. If any pollutant limits exceed the surface water quality limits, the water would discharged into the City's sanitary sewer or be removed from the site by a licensed disposal company. Detailed discussion of soil and groundwater contaminates of concern, including MTCA, EPA, and Port Acceptance criteria, are described in detail in the CMMP as submitted under separate cover.

Dewatering and groundwater from Area 200 and the portion of Area 500 within the Environmental Restrictive Covenant Areas will need to be tested for the following pollutants of concern listed for both soil and groundwater to determine appropriate disposal methods for work near each of the following Deed Restrictive Areas.

Table 26. Summary of the Deed Restricted Areas at the Proposed Project Site

Area (see Fig 6)	Summary	Contaminants of Concern[4]		Regulatory or Cleanup Status
		Soil	Groundwater	
Ecology/ALCOA Consent Decree 95-2-03268-4				
Vanexco Cap	PCB impacted soil removal occurred in 1992. Groundwater monitoring from 1996 through 2001 indicated that groundwater is not affected by residual PCB impacted soils. The building foundations and floor slabs were left in place to form a cap over the contaminated soils as required by the Consent Decree. Approximately 4 feet of surface material was placed above the foundation and is sloped to provide drainage away from the area or the foundation is replaced with an impervious	PCBs – (concentrations up to 2,000 ppm left in soil and 16,000 ppm in concrete pit chip samples left in place after EPA approval in 1992) and hydraulic oil (greater than 2,000 ppm. 9 feet below the ground surface	No COCs detected (depth ranges from approximately 15 feet to 25 feet bgs)	Vanexco Cap

[4] Anchor Environmental LLC, 2008. "ALCOA/Evergreen Vancouver Site RI/FS"

Area (see Fig 6)	Summary	Contaminants of Concern[4]		Regulatory or Cleanup Status
		Soil	Groundwater	
	layer and stormwater control facilities are located above the layer.			
Ecology/ALCOA Consent Decree 92-2-00783-9				
Spent Pot Liner (SPL) Cap	A former EPA NPL site; 47,500 cubic yards of spent pot liner and reclaimed alumina insulation were removed in 1992. The residual affected soils were capped with a high-density polyethylene (HDPE) cover. In 2010 the Port of Vancouver placed a specially engineered double layered asphalt cap over the HDPE cover.	Cyanide (concentrations up to 491 mg/kg) and fluoride (concentrations up to 2,500 mg/kg) Potentially extending from the HDPE cover to approximately 15 feet bgs, the vertical point of compliance defined in the Final 2008 Corrective Action Plan	Fluoride (concentrations up to 27,500 ug/l)	Spent Pot Liner (SPL) Cap
Ecology/Evergreen Enforcement Order 4931				
Ingot Cap	Approximately 14,000 tons of brick, concrete, and soil were removed and the area was covered with 1 foot of soil. Subsequently the Port has placed additional material over the capped area to raise the site grade.	PCBs at concentrations less than 10 mg/kg are estimated to be present from 1 foot bgs to the depth of the groundwater surface, between approximately 15 and 25 feet bgs	None detected	Ingot Cap
Ecology/ALCOA Agreed Orders DE90-I053 and DE03 TCPIS-5737				
North/North 2 Landfill	In 2004 approximately 38,000 cubic yards of contaminated soil at the North/North 2 Landfill site was removed and the area was covered with 1 foot of sand.	Concentrations likely present up to the following industrial MTCA site soil clean levels: PCBs (up to 10 mg/kg),PAHs (20 mg/kg), VOCs (up to 0.03 mg/kg trichloroethylene [TCE]) (estimated to be present from 1 foot bgs down to at least groundwater level)	VOCs [vinyl chloride at 3.3 micrograms per liter (ug/l)], PAHs [benzo(a)-pyrene up to 0.30 ug/l] and PCBs (up to 2 ug/l) Groundwater level is estimated at 15 to 25 feet bgs.	North/North 2 Landfill

Area (see Fig 6)	Summary	Contaminants of Concern[4]		Regulatory or Cleanup Status
		Soil	Groundwater	
Ecology/ALCOA Consent Decree 09-2-00247-2				
East Landfill	Contaminated material from the South Bank and North/North 2 landfills were placed into the East Landfill in 2003. A multi-layer impermeable cap consisting of a geosynthetic liner and a clay layer covered with HDPE, a synthetic drainage net, a 19-inch layer of compacted fill soil, a 6-inch layer of soil and vegetation was placed over the East Landfill in 2004. The shoreline adjacent to the East Landfill was armored to provide long-term stability of the riverbank and engineered cap.	Lead, cyanide, fluoride, PCBs (concentrations exceeding 10 mg/kg), petroleum hydrocarbons, VOCs (concentrations potentially exceeding 0.03 mg/kg for TCE) and PAHs (concentrations potentially exceeding 20 mg/kg) (estimated present in soil below approximately 2 feet bgs)	VOCs: (TCE, vinyl chloride) (TCE concentrations up to 620 ug/L in the intermediate zone)	East Landfill
Ecology/ALCOA Agreed Order DE97 TCI032				
Northeast Parcel	In 1997 approximately 12,000 tons of contaminated soil were removed from the Northeast Parcel. Confirmation soil samples indicated that the site was remediated in accordance with MTCA Method A unrestricted use soil cleanup levels. The area was covered with clean fill compacted, graded for proper surface water drainage, and vegetated.	PCBs, metals, and PAHs (estimated to be present below groundwater depth at concentrations less than MTCA Method A CULs.	VOCs (vinyl chloride – 6.6 ug/l) Groundwater level is estimated at about 10 feet bgs (Hahn and Associates, 2013)	Northeast Parcel

Areas 200, 300, and 400

Dewatering from excavations within or adjacent to capped areas would be completed in accordance with provision set forth in Element 9. Excavation dewatering from all other areas would be pumped to weir tanks or construction conveyance channels or pipes. Excavation dewatering is typically sediment laydown and large sediments would be treated with weir tanks. Additional downstream filtration would consist (at a minimum) of sand filters. When necessary, chemical treatment (flocculent) would be added to verify compliance with water quality standards.

Areas 500 and 600 and Rail Improvements

Dewatering is not anticipated in these areas, therefore BMPs are not expected to be required in these facility areas. The relatively shallow depth of the proposed excavations in these areas is such that groundwater is not anticipated.

3.1.11.1 Construction Stormwater Chemical Filtration (BMP C250)

Section 3.1.5.1 above discusses construction stormwater chemical filtration.

3.1.11.2 Construction Stormwater Filtration (BMP C251)

Section 3.1.5.3 above discusses construction stormwater filtration.

3.1.11.3 Weir Tanks (Custom BMP)

Section 3.1.3.4 above discusses weir tanks.

3.1.12 Element 11: Maintain BMPs

All TESC BMPs would be maintained and repaired as needed to assure continued performance of their intended function. Maintenance and repair would be conducted in accordance with the specifications of the particular BMP (attached in Appendix H). The BMPs would be monitored at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the frequency of inspection would be reduced to once every month.

All TESC BMPs would be removed within 30 days after the final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment would be removed or stabilized on site. Disturbed soil resulting from removal of BMPs or vegetation would be permanently stabilized.

3.1.13 Element 12: Manage the Project

Erosion and sediment control BMPs for this project have been designed based on the following principles:

- Design the project to fit the existing topography, soils, and drainage patterns.
- Emphasize erosion control rather than sediment control.
- Minimize the extent and duration of the area exposed.
- Keep runoff velocities low.
- Retain sediment on site.
- Monitor the site thoroughly and maintain all erosion and sediment control measures.
- Schedule major earthwork during the dry season.

In addition, as this project site is located west of the crest of the Cascade Mountains, the project will be managed according to the phasing discussed in sections 3.1.13.1 through 3.1.13.5.

3.1.13.1 Sequencing of Construction

Construction is being phased to the extent practicable in order to prevent soil erosion and, to the maximum extent possible, the transport of sediment from the site during construction.

Revegetation of exposed areas and the maintenance of that vegetation will be integral to clearing activities during each phase of construction, per the scheduling BMP (C 162).

3.1.13.2 Seasonal Work Limitations

From 1 October through 30 April, clearing, grading, and other soil-disturbing activities will be permitted and wet-weather BMPs are proposed to contain and treat silt-laden runoff prior to discharge from the site. The following measures are in place to protect water quality during wet weather.

- Advanced turbidity and TSS treatment methods including weir tanks, sand filtration, and enhanced sand filtration;
- Existing site infrastructure and downstream water quality treatment located on Terminal 5, and the Marine Terminal area; and
- Proposed erosion and sediment control measures.

3.1.13.3 Coordination with Utilities and Other Jurisdictions

Project planners have coordinated with utilities, other construction projects, and the local jurisdiction in preparing this construction SWPPP and scheduling the construction work.

3.1.13.4 Inspection and Monitoring

All BMPs would be inspected, maintained, and repaired as needed to assure continued performance of their intended function. Site inspections would be conducted by a person who is knowledgeable in the principles and practices of erosion and sediment control. This person will have the necessary skills to:

- Assess the site conditions and construction activities that could impact the quality of stormwater, and
- Assess the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges.

A CESCL would be on site or on call at all times.

As stated above, whenever inspection and/or monitoring reveal that the BMPs identified in this construction SWPPP are inadequate because of the actual discharge of, or potential to discharge, a significant amount of any pollutant, the CESCL will promptly initiate the implementation of one or more of the alternate BMPs listed in Appendix J.

3.1.13.5 Maintaining an Updated Construction SWPPP

This construction SWPPP will be retained on site or will be reasonably accessible to it.

The construction SWPPP will be modified whenever there is a change in the design, construction, operation, or maintenance of the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

The construction SWPPP will be modified if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the plan is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The plan will be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the plan will be completed within seven (7) days following the inspection.

The schedule of BMP implementation will be driven by the construction schedule. Table 27 is a sequential list of the proposed construction schedule milestones.

BMP implementation is keyed to proposed phases of the construction project, and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the crest of the Cascade Mountains and the dry season therefore is considered to be from 1 May to 30 September and the wet season is considered to be from 1 October to 30 April.

Table 27. Preliminary Construction Schedule

Construction Milestone	Anticipated Milestone Date
Construction Start Date	January 4, 2016
Completion of Underground Utility Installation	May 1, 2016
Initial Site Stabilization	May 1, 2016
Commissioning of proposed stormwater system	May 1, 2016
Facility Operations Startup	June 1, 2016
Completion of Grading	July 1, 2016
Landscape Installation	July 1, 2016
Facility Tanks 1-4 Operational	February 1, 2017
Final Grading (Tanks 5-6)	February 1, 2017
Landscape Installation (Tanks 5-6)	March 1, 2017
Facility Tanks 5-6 Operational	November 1, 2017

4. Pollution Prevention Team

4.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementing the construction SWPPP. They include the following persons.

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead[5].

4.2 Team Members

The following pollution prevention team members have been identified. The specific names and phone numbers will be provided prior to construction will be maintained current throughout Facility construction.

Table 28. Pollution Prevention Team Members

Title	Names(s)	Phone No.
Construction Project Manager and Emergency Owner Contact	TBD	(XXX) XXX-XXXX
Certified Erosion and Sediment Control Lead (CESCL)	TBD	(XXX) XXX-XXXX
Resident Engineer	TBD	(XXX) XXX-XXXX
Emergency Ecology Contact	TBD National Response Center Washington Emergency Management	(XXX) XXX-XXXX (800) 424-8802 (800) 258-5990
Non-Emergency Ecology Contact	TBD	(XXX) XXX-XXXX
Monitoring Personnel	TBD	(XXX) XXX-XXXX
Conveyance & Treatment System Operator and/or vendor	TBD	(XXX) XXX-XXXX
Contractor Project Managers	TBD	(XXX) XXX-XXXX
Equipment operators and construction personnel	TBD	(XXX) XXX-XXXX
All persons on site	TBD	(XXX) XXX-XXXX

[5] The Applicant recognizes that EFSEC may also provide an Environmental Monitor for the construction of the Facility at the Certificate Hodler's cost. Such Environmental Monitor will be added to the Pollution Prevention Team if requested by EFSEC.

5. Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site logbook. A site logbook will be maintained for all on-site construction activities and will include records of the following.

- Implementation of the construction SWPPP and other permit requirements
- Site inspections
- Stormwater quality monitoring

For convenience, the inspection form and water quality monitoring forms included in this construction SWPPP include the required information for the site logbook. This construction SWPPP may function as the site logbook if desired, or the forms may be separated and included in a separate site logbook. However, if separated, the site logbook but must be maintained on site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

5.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a CESCL per BMP C160. The name and contact information for the CESCL is provided above in section 1.4 of this construction SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site logbook or forms provided in Appendix L. All new BMPs or design changes will be documented in the construction SWPPP as soon as possible.

Preliminary monitoring points are identified in Figures 3 and 4. Discharge locations may vary throughout construction and final Facility design. Updates to the construction SWPPP will be maintained in accordance with section 6.1.4.

5.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the frequency of inspection can be reduced to once every month.

5.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix L. The site inspection log forms may be separated from this construction SWPPP document, but will be maintained on site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

5.2 Stormwater Quality Monitoring

5.2.1 Turbidity

Turbidity sampling and monitoring will be conducted during the entire construction phase of the project. Samples will be collected daily at each monitoring point identified. If there is no flow at any location the attempt to sample will be recorded in the site logbook and reported to Ecology in the monthly discharge

monitoring report (DMR) as “No Discharge.” Samples will be analyzed for turbidity using the EPA 180.1 analytical method.

The key benchmark turbidity value is 25 nephelometric turbidity units (NTU) for the downstream receiving water body. If the 25 NTU benchmark is exceeded in any sample collected, the following steps will be conducted.

1. Verify all BMPs specified in this construction SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document modified BMPs in the construction SWPPP as necessary.
3. Sample discharge daily until the discharge is 25 NTU or lower.

If the turbidity exceeds 25 NTU at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see section 1.4 for contact information).
2. Continue sampling daily until the discharge is 25 NTU or lower.
3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours, and implement those additional treatment BMPs as soon as possible, but within a maximum of 7 days.
4. Describe inspection results and remedial actions taken in the site logbook and in monthly DMRs as described in section 6.2.1.

5.2.2 pH

Sampling and monitoring for pH will occur during the phase of construction when concrete pouring will be conducted until fully cured (3 weeks from last pour) and discharges are documented to be below pH 8.5. Samples will be collected weekly at the sedimentation pond prior to discharge to surface water. Samples will be analyzed for pH using a calibrated pH meter and recorded in the site logbook.

The key benchmark pH value for stormwater is a maximum of 8.5. If a pH greater than 8.5 is measured in the sedimentation trap/pond(s) that has the potential to discharge to surface water, the following steps will be conducted:

1. Prevent (detain) all discharges from leaving the site and entering surface waters or storm drains if the pH is greater than 8.5
2. Implement CO_2 sparging or dry ice treatment in accordance with Ecology BMP C252.
3. Describe inspection results and remedial actions that are taken in the site logbook and in monthly discharge monitoring reports as described in section 6 of this construction SWPPP.

5.2.3 Contaminates of Concern

A CMMP has been prepared under separate cover to address contaminates of concern in areas of the site near existing landfill areas, caps, and addresses groundwater restrictive covenant on Terminal 5. Detailed testing methodologies and regulatory limits for these contaminates are provided in that report.

6. Reporting and Recordkeeping

6.1 Recordkeeping

6.1.1 Site Logbook

A site logbook will be maintained for all on-site construction activities and will include records of the following.

- Implementation of the construction SWPPP and other permit requirements
- Site inspections
- Stormwater quality monitoring

For convenience, the inspection form and water quality monitoring forms included in this construction SWPPP include the information that is required for the site logbook.

6.1.2 Records Retention

Records of all monitoring information (site logbook, inspection reports/checklists, etc.), this construction SWPPP, and any other documentation of compliance with permit requirements, will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with anticipated permit conditions similar to Industrial Stormwater General Permit condition S5.C.

6.1.3 Access to Plans and Records

The construction SWPPP, Construction Stormwater Permit No. TBD, and site logbook will be retained on site, or within reasonable access to the site, and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this plan will be provided to Ecology within 14 days of receipt of a written request for it from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the construction SWPPP, or access to it, will be provided to the public when requested in writing in accordance with anticipated permit conditions similar to Industrial Stormwater General Permit condition S5.G.

6.1.4 Updating the Construction SWPPP

In accordance with anticipated permit conditions similar to Industrial Stormwater General Permit conditions S3, S4.B, and S9.B.3 of the General Permit, this construction SWPPP will be modified if it is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or if there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the state. The construction SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

6.2 Reporting

6.2.1 Discharge Monitoring Reports

DMRs will be submitted to Ecology electronically. If there was no discharge during a given monitoring period, the Permittee will submit the form as required, with the words “no discharge” entered in the place of monitoring results. The due date of the DMR is 15 days following the end of each month.

6.2.2 Notification and Noncompliance

If any of the terms and conditions of the permit are not met causing a threat to human health or the environment, the following steps will be taken in accordance with anticipated permit conditions similar to Industrial Stormwater General Permit section S5.F.

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 25 nephelometric turbidity units (NTU) or greater, Ecology’s regional office will be notified by phone within 24 hours of analysis as required by anticipated

permit conditions similar to Industrial Stormwater General Permit t condition S5.A (see section 1.4 above for contact information).

In accordance with anticipated permit conditions similar to Industrial Stormwater General Permit condition S4.F.6.b, Ecology's regional office will be notified if chemical treatment other than CO_2 sparging is planned for adjustment of high pH water (see section 0 above for contact information).

7. List of Acronyms and Abbreviations

Applicant: Tesoro Savage Petroleum Terminal LLC

AST: aboveground storage tank

bbl: barrel and barrels

BFE: Base Flood Elevation

bgs: belowground surface

BMPs: best management practices

bpd: barrels per day

BTEX: benzene, toluene, ethylbenzene, and xylenes

CESCL: Certified Erosion and Sediment Control Lead

CFR: Code of Federal Regulations

cfs: cubic feet per second

City: City of Vancouver

CMMP: contaminated media management plan

COCs: contaminants of concern

CRD: Columbia River Datum

DMR: discharge monitoring report

Ecology: Washington State Department of Ecology

EFSEC: Energy Facility Site Evaluation Council

EPA: U.S. Environmental Protection Agency

Facility: Vancouver Energy Terminal

FEMA: Federal Emergency Management Agency

FIRMs: Flood Insurance Rate Maps

GMA: Growth Management Act

gpm: gallons per minute

GRI: Geotechnical Resources, Inc.

HAZWOPER: hazardous waste operations and emergency response

HDPE: high-density polyethylene

MTCA: Model Toxics Control Act

NAVD: North American Vertical Datum

NEPA: National Environmental Policy Act

NGVD: National Geodetic Vertical Datum

NPDES: National Pollutant Discharge Elimination System

NTU: nephelometric turbidity unit

PAHs: polynuclear aromatic hydrocarbons

PBDE: polybrominated diphenyl ether

PCBs: polychlorinated biphenyls

Port: Port of Vancouver USA

PPE: personal protection equipment

RCW: Revised Code of Washington

RM 103.5: River Mile 103.5

SEPA: State Environmental Policy Act

SMMWW: Stormwater Management Manual for Western Washington

SWPPP: stormwater pollution prevention plan

SPL: spent pot liner

SR 501: State Route 501

TAP: toxic air pollutant

TCE: trichloroethylene

TESC: temporary erosion and sediment control

TSS: total suspended solids

USGS: U.S. Geological Survey

VOC: volatile organic compound

WAC: Washington Administrative Code

WDFW: Washington State Department of Fish and Wildlife

WVFA: West Vancouver Freight Access

WWHM: Western Washington Hydrology Model

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