Vancouver Energy
Water Quality Protection and Monitoring Plan

Plan No. C.03 | Revision 01

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Vancouver Energy
Water Quality Protection and Monitoring Plan

EFSEC Application for Site Certification No. 2013-01
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Table of Contents

Section

1. Introduction 1
1.1 Purpose of Plan 1
1.2 Regulatory Requirements 1
1.3 Water Quality Criteria 3
1.4 Related Documents 3
2. Water Quality Protection Measures 4
2.1 General Water Quality Protection Measures 4
2.2 General Overwater Construction Work 5
2.2.1 Dock Modifications 5
2.2.2 Pile Strengthening 6
2.2.3 Dockside Equipment Installation 7
2.3 Upland Construction Work 7
2.4 Nearshore and Abutment Ground Improvements 7
3. Water Quality Monitoring 9
3.1 Visual Monitoring 9
3.1.1 Monitoring Parameters 10
3.1.2 Monitoring Schedule 10
3.1.3 Monitoring Locations 10
3.2 Instrumented Monitoring 11
3.2.1 Monitoring Locations 11
3.2.2 Monitoring Depths 12
3.2.3 Monitoring Parameters 13
3.2.4 Monitoring Schedule 13
3.3 Record Keeping and Reporting 13
3.3.1 Monitoring Reports 14
3.3.2 Notification of Exceedances 14
4. Contingency Response and Notification Plan 14
4.1 Visible Turbidity Plume 14
4.2 Instrumented Monitoring 15
4.3 Overwater Concrete Work 15
4.4 Construction Debris in Water 16
4.5 Distressed or Dying Fish 16
4.6 Nearshore and Abutment Ground Improvements 16
4.7 Discharge of Oil, Fuel, or Chemicals 17
5. List of Acronyms and Abbreviations 17

List of Tables

Table 1. Water Quality Standards for Lower Columbia River 3
Table 2. Monitoring Depth Summary 13

List of Figures

Figure 1. Facility Site Plan 2
Figure 2. Monitoring Locations 12

List of Appendices

Appendix A. Sample Daily Monitoring Log
Appendix B. Sample Report Template

1. Introduction

Vancouver Energy (Facility) provides transloading services for pipeline quality crude oil from railcars to marine vessels. The Facility is located at 5501 NW Old Lower River Road, Vancouver, Washington; it is situated at the Port of Vancouver USA (Port) on the north bank of the Columbia River at approximately River Mile 103.5 (RM 103.5). The Facility site is approximately 47.4 acres in size and comprises elements within the following "area" groupings, as illustrated in Figure 1.

- Area 200 – Rail Unloading – located at Terminal 5 of the Port
- Area 300 – Storage – located at Parcel 1A of the Port
- Area 400 - Marine Terminal – located at berths 13 and 14 at the Port
- Area 500 –Transfer Pipelines – located in locations between areas 200, 300, and 400
- Rail Infrastructure – located at Terminal 5 of the Port

The Facility receives an average of four unit trains per day and unloads an average of 360,000 barrels (bbl) of crude per day. Six nominal capacity 380,000 bbl tanks are used to store crude oil on site. A transfer pipeline system is used to convey crude oil from Area 200 to Area 300 for storage, and from Area 300 to Area 400 for vessel loading. The transfer pipeline system can also be operated to move oil from Area 200 directly to Area 400. The Facility will operate 24 hours a day, 7 days a week.

1.1 Purpose of Plan

This water quality protection and monitoring plan (WQPMP) describes how Vancouver Energy will monitor and control releases of turbidity, suspended sediment, concrete, and other construction-related materials that may be generated during Facility construction activities in, over, and adjacent to the Columbia River and other adjacent water bodies. This WQPMP describes water quality protection measures; monitoring parameters, methods, evaluation criteria; and contingency response and notification procedures in the event a water quality criterion is exceeded during such construction activities. This WQPMP does not apply to Facility operations.

1.2 Regulatory Requirements

This WQPMP is implemented to provide guidance for construction activities to comply with the following regulatory requirements.

- Section 401 of the Clean Water Act, for which the Energy Facility Site Evaluation Council (EFSEC) is delegated regulatory authority for this Facility
- Washington State Water Pollution Control Act (Chapter 90.48 Revised Code of Washington [RCW])
- Washington State Surface Water Quality Standards (Chapter 173-201A [WAC])

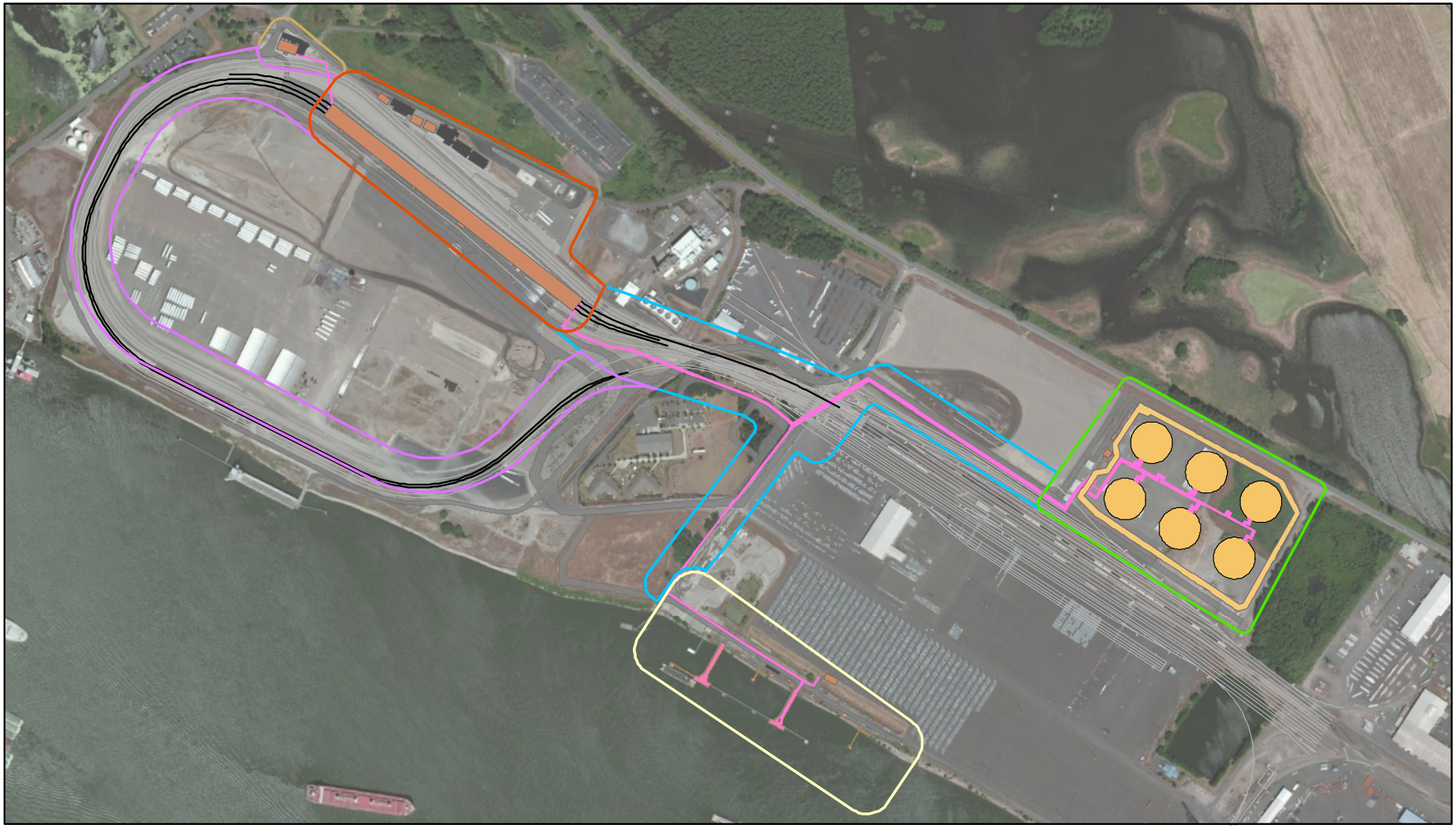

Figure 1 - Site Plan

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

VANCOUVER ENERGY

Tesoro Savage Petroleum Terminal LLC

Date: February 2015

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

EX-0001-005524-PCE

1.3 Water Quality Criteria

The designated uses for the Columbia River between the river mouth (RM-0) and the Washington-Oregon border (RM-309.3), inclusive of the Facility site, include salmonid spawning, rearing, and migration; primary contact recreation; various water supply uses (domestic, industrial, agricultural, and stock water supply); and other miscellaneous uses, such as wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics (WAC 173-201A-602). In consideration of the site construction activities (dock modifications, pile and overwater structure removal, overwater concrete work, and upland ground improvements), turbidity and pH are the primary water quality parameters of concern for this project. Table 1 presents the water quality standards for turbidity and pH (WAC 173-201A-200[1][e] and [1][g], respectively) to support the designated uses associated with this reach of the Columbia River. The water quality standards are applicable to all construction activities performed below the ordinary high water mark (OHWM) and other activities subject to this WQPMP.

Table 1. Water Quality Standards for Lower Columbia River

Monitoring Parameter	Water Quality Criterion	
Turbidity	If less than 50 NTU:	Background Turbidity plus 5 NTU
	If greater than 50 NTU:	Background Turbidity plus 20 percent
pH	pH will be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 unit.	

Note: NTU = nephelometric turbidity unit

The water quality standard for turbidity will need to be met at the compliance boundary at the edge of an authorized temporary area of mixing for construction activities following the implementation of appropriate best management practices (BMPs). The area of mixing extends 300 feet from the point of construction, as authorized in WAC 173-201A-200(1)(e)(i)(C) (Figure 2). The critical monitoring location will typically be directly 300 feet downstream (i.e., west-northwest) from the point of construction, although tidal reversals are possible during flood tide conditions, which could shift the critical monitoring location 300 feet upstream.

The pH standard has no area of mixing and must, therefore, be met at the location of the discharge with no dilution.

In addition to the numerical criteria in Table 1, the Facility must also comply with narrative water quality standards, including the following.

- No visible petroleum sheen on water observed at the construction site.
- No distressed or dying fish observed at the construction site and attributed to site activities.

These narrative criteria are not subject to an area of mixing and, therefore, must be met at the construction activity location with no dilution.

1.4 Related Documents

The following documents and plans implement additional protective measures and procedures in addition to those presented in this WQPMP.

- Construction Stormwater Pollution Prevention Plan (SWPPP) – the construction SWPPP outlines BMPs designed to minimize erosion from construction activities as part of NPDES compliance. This plan focuses on the prevention of stormwater pollution by minimizing, capturing, and treating runoff from construction sites.

- Construction Spill Prevention, Control, and Countermeasures Plan (SPCCP) – the construction SPCCP outlines BMPs, response actions in the event of a release, and notification and reporting procedures. The construction SPCCP also outlines management elements, such as personnel responsibilities, construction site security, site inspections, and training. Finally, the construction SPCCP lists spill response equipment and where such equipment is maintained on site.

2. Water Quality Protection Measures

This section describes the construction activities covered by this WQPMP and the protection measures or BMPs that will be implemented to minimize impacts to water quality. In addition to implementing the protection measures described in this WQPMP, water quality monitoring will be performed during specific construction activities to determine protection measures are effective, as described in section 3. General and activity-specific water quality protection measures are described in the following subsections.

2.1 General Water Quality Protection Measures

Description: Construction activities that are proposed within, over, and adjacent to waters of the state are subject to state water quality standards.

Water Quality Protection Measures: The following BMPs will be implemented during all work in, over, or near the water to minimize effects to water quality.

- The contractor's construction SWPPP and construction SPCCP will be implemented. A copy of the construction SWPPP and construction SPCCP with any updates will be maintained in the construction office at the work site.
- All equipment will be maintained in good proper running order to prevent leaking or spilling of potentially hazardous or toxic substances, including, but not limited to, hydraulic fluid, diesel, gasoline, and other petroleum products.
- All construction equipment will be inspected daily before use to verify that the equipment has no fluid leaks. Should a leak develop during use, the leaking equipment will be removed from service immediately and will not be used again until it has been adequately repaired. At no time will fuels or oils be intentionally allowed to enter the river or spilled to ground.
- In the event of inadvertent release of fuels, lubricants, or other materials during construction, containment and cleanup efforts will begin immediately and be completed in an expeditious manner, in accordance with all local, state, and federal regulations, and will take precedence over normal work. Spill response kits will be staged at the work site. Cleanup will include proper disposal of any inadvertently released material and used cleanup material.
- All equipment using hydraulics used over the water will use biodegradable hydraulic fluids.
- Debris boom(s) will be placed around the work areas to contain demolition or construction materials or litter that may inadvertently drop into the water.
- Any debris dropped into the water will promptly be removed by the contractor. The contractor will have a boat available and on site during in-water activities for debris retrieval.
- Excess or waste materials generated during construction will not be disposed of or abandoned waterward of the OHWM or allowed to enter surface waters. Waste materials will be collected and disposed of in an appropriate site.
- Demolition and construction materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.
- Unless stated otherwise below, all in-water work performed "in the wet[1]" will be completed within the in-water work window approved in the Site Certification Agreement ("approved in-water work window") to protect sensitive fisheries and aquatic resources.
- Other work elements below the OHWM may be performed "in the dry" and will be removed or isolated from direct contact with the river. Examples include working on the bank during low-water conditions, conducting pile strengthening activities inside existing piles, working on structures above the water level, and moving structures or

[1] "Work in the wet" includes any activity that physically occurs in the water where equipment or materials will be submerged. Conversely, "work in the dry" is defined as an activity that does not include physical contact with water, either by equipment or material.

components built off site onto the Facility site. Such activities are, therefore, proposed to be conducted irrespective of the designated in-water work window.

- Pile cut-offs, waste, or any miscellaneous unused materials will be recovered for either disposal in a designated facility or placed in storage. No such material will be intentionally discharged or released into surface waters.
- Contractors will have emergency spill equipment available whenever working in or near the water.
- Contractors will position waterborne equipment (e.g., pile-driving barges) in a manner that will minimize damage to existing habitat.
- Corrective actions, including those listed below, will be taken in the event of any release of oil, fuel, or chemicals from construction vessels, equipment, or materials into surface waters.
- The cause of the inadvertent release will be assessed and appropriate action will be taken to prevent further incidents or environmental damage.
- Inadvertent releases will be reported to EFSEC and any local and state agency representatives delegated by EFSEC to receive such notices, for example Ecology's Southwest Regional Spill Response Office at 360/407-6300.
- Work barges will not be intentionally grounded on the river bottom during construction.

2.2 General Overwater Construction Work

Overwater construction activities are specific to Area 400 and are associated entirely with the existing dock. These activities include dock modifications, pile strengthening, and dockside equipment installation.

2.2.1 Dock Modifications

Description: Modifications to the existing dock will likely require overwater welding, cutting, and other general overwater construction work. Because this work will occur out of the water, it will not be constrained to the approved in-water work window. The construction activities will consist of adding structural capacity to the existing piles supporting the dock and mooring dolphins; removal and replacement of the decking, mooring hardware, and fendering system; and removing portions of the structure that conflict with mooring lines. Two upland mooring points will be installed above the OHWM using impact pile driving. Temporary piles will be installed with a vibratory hammer where needed for construction. They will then be removed using vibratory extraction after construction is completed. BMPs described below will be implemented to protect water quality.

Existing piles will be removed using vibratory extraction or by pulling them with a crane mounted on a barge. If a pile is unable to be completely removed using vibratory or pulling methods, the pile will be cut off at or below the mudline using an articulating diamond wire saw or cutting torch or pushed into the sediment.

The existing terminal deck will be removed and replaced with a new concrete structure. New concrete pile caps will be formed using watertight forms. The superstructure will be constructed with steel framing with a steel grid deck and a poured-in-place concrete topping slab. Grated walkways and trusses will be manufactured off site and brought to the site for installation. Deck replacement occurs above OHWM and will not be constrained to the approved in-water work window.

Water Quality Protection Measures: In addition to the general BMPs described above, the following BMPs will be implemented during pile removal.

- Checking construction vessels and equipment for leaks and/or other problems that could result in discharge of petroleum-based products or other material into surface waters.
- Facility construction will be completed in compliance with Washington State Water Quality Standards (WAC 173-201A), including
  - No petroleum products, fresh cement, lime, concrete, chemicals, or other toxic or deleterious materials will be intentionally allowed to enter surface waters.
  - There will be no intentional discharge of oil, fuels, or chemicals to surface waters or onto land where there is a potential for reentry into surface waters.

- Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc. will be checked regularly for leaks, and materials will be maintained and stored properly to prevent inadvertent releases.

- Existing piles will be dislodged with a vibratory hammer, when possible, and will not be intentionally broken by twisting or bending. If a pile breaks above the mudline, it will be cut off at or below the mudline or pushed into the sediment.
- The piles will be removed in a single, slow, and continuous motion so as to minimize sediment disturbance and turbidity in the water column.
- Removed piles, stubs, and associated sediment (if any) will be promptly transferred to a barge or onto the uplands. If a barge is used, the work surface will fully contain any associated sediment or liquid removed along with the piles. Any water contained on the barge deck will not be discharged into surface waters. Water will be sent to temporary holding tanks on the barge, and pumped to approved shore-based facilities for disposal.

2.2.2 Pile Strengthening

Description: The piles are not anticipated to contain significant sediment as they were driven partially closed ended. If necessary, sediment will be removed by the contractor, likely using an air lift or auger, which will bring the sediment to the top of the existing piles. On the surface, sediments and any sediment-laden water will be pumped to temporary containment tanks/areas to prevent it from flowing into surface waters. A skirt or similar device will be attached to the top of the pile to collect any sediment or water that spills out of the pile. Sediments collected in this manner will be transported off site for disposal in an approved location.

Micropiles will be drilled into the substrate below the pile tip from within the existing pile. Any spoils generated by drilling will be fully contained within the existing pile and will be prevented from contacting surface water to the maximum extent possible. Spoils from the drill will be brought back up through the pile, similar to the extraction of sediment prior to drilling, and directed to containment tanks/areas for off-site disposal. Because all work will occur within an existing pile, the spoils will not contact surface water.

Water Quality Protection Measures: The following BMPs will be implemented to minimize effects to water quality during pile strengthening construction work.

- Blocking deck drains on the existing dock to prevent runoff during pile strengthening activities.
- A skirt or other containment will be attached to the top of the pile to collect sediment and turbid water.
- Runoff or pumpout water will be directed to temporary storage tanks for treatment if needed to meet water quality standards.
- Any piping used to convey runoff or pump-out water will be watertight to prevent leakages or discharges to surface water.

Overwater concrete work will occur when placing grout inside existing piles and replacing the concrete deck. The following BMPs will be followed during these elements.

- Wet concrete will be isolated from contact with surface water.
- Watertight forms will be used to prevent leakage.
- Forms will be kept in place until curing is complete.
- If concrete is discharged from the concrete truck directly to the form work or placed by wheelbarrow, properly sealed chutes will be constructed to avoid spillage.
- If the concrete is being placed with a concrete pump, verify that all hose and pipe connections are properly sealed and locked.
- All concrete forms will be constructed in a manner that will prevent fresh concrete or cement-laden water from leaking into the surrounding water.
- Crews will monitor all pours to verify that concrete forms are not filled to overflowing or leaking.
- All tools, pumps, pipes, hoses, and trucks used for finishing, placing, or transporting fresh concrete will be washed off to prevent the wash water and excess concrete from entering the marine environment. The wash water will be contained and disposed of upland in an environmentally acceptable manner.
- Water will not be used to cure concrete.

2.2.3 Dockside Equipment Installation

Description: Construction of transfer pipelines and shiploading infrastructure (e.g., pumps, jib cranes, piping) will occur on the modified access trestle and dock. Construction will not be constrained to the approved in-water work window as there is no in-water component, but activities will occur over water and above the OHWM elevation.

Water Quality Protection Measures: BMPs described above for dock modifications will be implemented to minimize effects to water quality.

2.3 Upland Construction Work

Description: Upland work associated within Area 400 includes the construction of shore-based infrastructure to support vessel loading activities. This includes construction of a control room and E-house, fire pump and foam facilities, a marine vapor combustion unit, and lighting. Construction will not be constrained to the approved in-water work window as there is no in-water component.

Water Quality Protection Measures: BMPs described for general water quality protection above will be implemented to minimize effects to water quality during upland construction.

2.4 Nearshore and Abutment Ground Improvements

Description: To meet seismic design requirements, upland ground improvements (jet grout columns, deep soil mixing panels, and stone columns[2]) have been designed to minimize potential liquefaction and lateral movement. There are two zones of ground improvement in Area 400: the "nearshore ground improvements" and the "abutment ground improvements." The nearshore ground improvements occur along the transfer pipeline alignment and parallels the shoreline adjacent to the existing berths 13 and 14. This zone of improvements is located entirely on the top of the existing bank. The abutment ground improvements occur at the Berth 13 abutment and extend from the top of bank waterward to the OHWM in the immediate area of the abutment.

Nearshore Ground Improvements

Ground improvements associated with transfer pipeline support include stone columns, jet grouting, and deep soil mixing[3]. Deep soil mixing panels will limit the potential liquefaction below the pipeline alignment, jet grout will provide vertical support of the pipe-rack foundation, and a series of stone columns will form a non-liquefiable buttress that stabilizes the shoreline area. According to the preliminary engineering design, the deep soil mixing panels are spaced approximately 35 feet apart and are planned to be 55 feet long, 6 feet wide, and extend to a depth of approximately 45 feet. A jet grout column, approximately 8 feet in diameter, will be situated below the deep soil mixing panels; the jet grout column will extend to a depth of approximately 32 feet below the deep soil mixing panels. The stone columns are located between the deep soil mixing panels and the top of the bank and are approximately 3 feet in diameter and spaced at approximately 8 feet on center. The stone columns extend to the non-liquefiable soils at about 78 feet below ground surface. Ground improvements along the majority of the pipeline alignment in Area 400 are set back a minimum of approximately 20 feet landward from OHWM.

Stone columns will be installed using a downhole vibratory probe to create subsurface vertical aggregate columns to reinforce, densify, and drain potentially liquefiable soils. The preferred installation method is

[2] As of the writing of this WQPMP, ground improvement design has not been fully completed. Other methods for ground improvement may be implemented, including jet grouting or soil mixing.

[3] Vancouver Energy Terminal Ground Improvements Design – Areas 300 and 400, prepared by Hayward Baker, Inc., April 15, 2015. This design is considered preliminary.

the dry bottom-feed process, in which the probe's weight and vibrations cause it to advance to the design depth. Then crushed gravel is fed into the soil at the vibrator tip, using air pressure through a feed pipe, attached to the vibrator. The stones displace the soil, creating a stiff, stone column that reinforces the improvement zone and densifies the surrounding soils.

Abutment Ground Improvements

The ground improvements that will occur in the vicinity of the proposed marine terminal abutment will include jet grouting and deep soil mixing. The area targeted for improvement in this zone is approximately 160 feet long (parallel to the river) and 72 feet wide (perpendicular to the river). Approximately 6-foot-diameter jet grout columns will be constructed to a depth of approximately 78 feet in this zone between the top of bank and the OHWM. Landward of the jet grout block at the top of bank, a combination deep soil mixing/jet grout, as described above for the nearshore ground improvement zone, would be constructed to support Area 400 facilities and transfer pipeline as it transitions from the shoreline to the terminal.

Water Quality Protection Measures: The following BMPs will be implemented to minimize effects to water quality during upland ground improvements. Proposed water quality protection measures are consistent with the recommendations in Ecology's internal memorandum, Guidance on Controlling Turbidity in Nearby Waters from Ground Improvement Work for Seismic Events (Ecology 2010).

- An air injection method for stone columns is selected over a water injection method to minimize the amount of soil and water generated at the surface during installation.
- The nearshore stone columns behind the dock structure will be positioned with a minimum setback distance at the top of the bank based on final engineering design. Ground improvements around the abutment will extend down the slope to landward of the OHWM.
- For jet grout ground improvements around the abutment (because these improvements are in such close proximity to the OHWM), sheet piling will be vibratory installed approximately 1 to 2 feet upland from, and parallel to, the OHWM. The sheet pile wall extends above the ground surface and will function as a barrier to minimize the potential for surface and subsurface grout migration toward the Columbia River[4].
- Grout spoils will be pumped, hauled, or otherwise conveyed to an upland location for management, treatment, and/or discharge/disposal. Grout spoils generated during jet grout installation will be contained by the use of berms, waddles, and by extending the sheet piling above the ground surface.
- For jet grout columns installed adjacent to sheet piling, the jet nozzles will only be rotated a half circle in the direction away from the sheet piling to minimize the potential for grout migration toward the shoreline.
- Where stone columns are installed, wick drains will be installed on the top of bank between the ground improvements closest to the shoreline and the OHWM. The wick drains will help to relieve excess pore water pressure and dissipate air flow through the subsurface to reduce the potential for air or water to exit the bank face and create turbidity in the river.

During nearshore and abutment ground improvement installation, the following additional BMPs will be implemented.

- Visual turbidity monitoring will be conducted during nearshore and abutment ground improvement installation behind the dock, as described in section 3. In particular, the installation locations closest to the water will be a high priority for the monitoring program.
- As a contingency measure, if turbidity is observed during ground improvement installation, additional engineering controls will be implemented.

[4] Preliminarily, the sheet piling will be installed to a depth of approximately 40 feet. The height of the wall above the ground surface will be sufficient to trap surface runoff during construction and will be specified in the final engineering plans. The depth of the sheet piling will not extend to the full depth of the jet grout columns. Furthermore, the sheet piling may be removed at the conclusion of ground improvement work, or may remain in place and be cut off below the surface if extraction is not possible.

- Instrumental pH monitoring will be conducted during jet column installation in the abutment area. Monitoring will be conducted along the shoreline closest to the location of jet grout installation.
- As a contingency measure, if pH monitoring indicates the migration of grout or impacted groundwater, additional BMPs or engineering controls may be implemented.
- The control of excess soil and water on the uplands at the ground improvement installation site is described in the construction SWPPP for this project. Upland BMPs will include an appropriate combination of perimeter controls, infiltration, and segregation of stormwater run-on/runoff.

3. Water Quality Monitoring

A combination of visual and instrumented monitoring will be conducted. Visual monitoring of turbidity generated by construction activities will be conducted for all in- and overwater work, including dock modifications, pile strengthening and replacement of concrete deck, and dockside equipment installation. In addition to turbidity, visual monitoring will be performed by a designated Vancouver Energy representative on an ongoing basis for floating debris, trash, oil sheen, etc. during in- and overwater construction activities. Specific visual monitoring protocols for ground improvements are described in section 3.1.

Instrumented turbidity monitoring will be implemented if potential violations are observed during visual monitoring. For example, a turbidity plume is observed during visual monitoring and followed up with instrumented to determine if turbidity exceeds standards.

Instrumented pH monitoring will be conducted during installation of jet grout ground improvements and during overwater concrete work until the concrete is set. The set period is the time it takes the grout or concrete to solidify and is no longer fluid and at risk of spilling into the water or mobilizing in the subsurface. The time required for concrete to set is dependent on the admixture specifications and environmental conditions at the time it is poured. Typically, concrete will set within a matter of hours. Instrumented monitoring will not be conducted past the set period.

In the event that an exceedance of water quality standards is indicated by either visual or instrumented monitoring, contingency response actions and agency notifications will be triggered. The contingency response and notification plan is described in section 4.

3.1 Visual Monitoring

Visual monitoring will be performed during all in-water and overwater construction activities, and installation of nearshore and abutment ground improvements. This includes

- Dock modifications, including pile removal, temporary pile placement and removal, and deck replacement
- Overwater casting of concrete pile caps and decking on the structure
- Pile strengthening
- Dockside equipment installation
- Construction of upland facilities immediately adjacent to the shoreline at Area 400
- Nearshore and abutment ground improvements adjacent to the shoreline

Visual monitoring will be performed on the water surface and a locations of installed BMPs. Instrumented monitoring, see section 3.2, will only be conducted if visual monitoring identifies a potential exceedance, e.g., visible plume or spill, to verify if an actual exceedance has occurred.

During nearshore and abutment ground improvements in the shoreline area, the adjacent river bank will be monitored from shore for air bubbles, which provide a clear visual indication of gas movement through the bank sediments. As a result of the control measures described above, it may be that no discharge of air is observed in the Columbia River. However, if air bubbles are observed, follow-up instrumented turbidity monitoring using a hydroprobe or equivalent will be performed, see section 3.2.2. If air bubbles

are observed during visual monitoring of ground improvements, instrumented turbidity monitoring will be activated. Turbidity measurements will be collected as close as practicable to the discharge area. The turbidity measurements will be compared to the turbidity standards (Table 1). These standards will be considered an action level for implementing additional controls, which are described in further detail in the next paragraph, and conducting instrumented turbidity monitoring.

If air bubbles are observed in the river during ground improvement installation, the following sequence of response procedures will be conducted.

- Turbidity will be measured as close as practicable to the discharge area. If turbidity is below the benchmark described above and continues to stay below the benchmark for three consecutive days, monitoring may revert to visual monitoring for stone columns installed at similar or greater setback distances.
- If turbidity is above the benchmark, an additional set of measurements will be collected 5 minutes later to confirm (or not confirm) a potential exceedance.
- If the potential exceedance is confirmed and is attributed to ground improvement installation activities, the contractor and designated Vancouver Energy representative will be immediately notified. The contractor will be directed to immediately modify operations to control turbidity, as feasible, potentially including slowing the pace of the work.
- Retake turbidity measurements 30 minutes later at the discharge site and the background location after additional operational modifications are implemented to assess the effectiveness of the modifications.

3.1.1 Monitoring Parameters

The following parameters will be assessed during visual monitoring.

- Turbidity
- Sheen
- Construction debris in the water
- Operation and effectiveness of BMPs

Visual monitoring will include photographic documentation.

3.1.2 Monitoring Schedule

The frequency of visual monitoring will be as follows.

- Ongoing monitoring by the contractor conducting the activity(ies) subject to this WQPMP during said construction operations.
- Monitoring by the designated Vancouver Energy representative every 4 hours during construction activities subject to this WQPMP.

Immediate visual confirmation by the designated Vancouver Energy representative is required if notified by the contractor of a potential water quality exceedance. If a visual exceedance is confirmed, follow-up instrumented monitoring will be implemented until water quality returns to compliance levels.

3.1.3 Monitoring Locations

Visual monitoring will be performed at the following locations.

- For BMP performance, at the location of the installed BMP
- For turbidity, at the locations specified in section 3.2.1 (i.e., 150 feet and 300 feet downstream from construction activity, plus upstream background)
- For visible sheen, at the point of discharge to the river
- For construction debris, including wet concrete, at the point of discharge to the river
- For ground improvements, the length of shoreline parallel to the marine terminal

Note that multiple activities requiring monitoring may occur simultaneously. Flow reversals in the river may shift monitoring locations. Upstream and downstream is used in conjunction with the direction of flow.

3.2 Instrumented Monitoring

Instrumented turbidity monitoring will be performed when visual monitoring detects a potential water quality exceedance during the following construction activities.

- As a contingency measure in response to visual observation of a significant turbidity plume, to better assess compliance with water quality standards and the effectiveness of any supplemental BMPs that may be implemented to control turbidity.
- Instrumented pH monitoring will be performed during overwater casting of concrete pile caps and decking and during the installation of jet column ground improvements in the abutment area until the concrete or grout is set.

The monitoring procedures outlined in the following subsections will be implemented during instrumented monitoring.

3.2.1 Monitoring Locations

During each monitoring event, the appropriate water quality parameters (i.e., turbidity and/or pH, depending on the activity) will be measured at the following stations (see Figure 2). Typically, monitoring stations are located with respect to the direction of river flow. Tidal flow reversals are possible on the section of the river, which essentially flips the location of the compliance, early warning, and background stations.

The Compliance Station varies by water quality parameter and construction activity. The Compliance Station for turbidity is at the edge of the area of mixing, 300 feet downstream from the construction activity. The Compliance Station for pH is as close as practicable to the construction activity involving active concrete or abutment jet grout work because pH has no area of mixing allowance.

The Early Warning Station for turbidity is at the midpoint of the authorized area of mixing, 150 feet downstream from the construction activity. The objective of the Early Warning Station is to become quickly aware of possible water quality excursions at the construction site and to be able to adjust construction operations and BMPs before an exceedance occurs at the Compliance Station.

The Background Station will be positioned approximately 500 feet upstream of the project site and beyond the influence of construction activities. The Background Station will be located along a part of the shoreline with comparable water depth and other physical characteristics (e.g., slope and substrate) to the extent possible. This station will be monitored during every monitoring event because the turbidity criterion is based on an acceptably small increase above ambient background levels in the river.

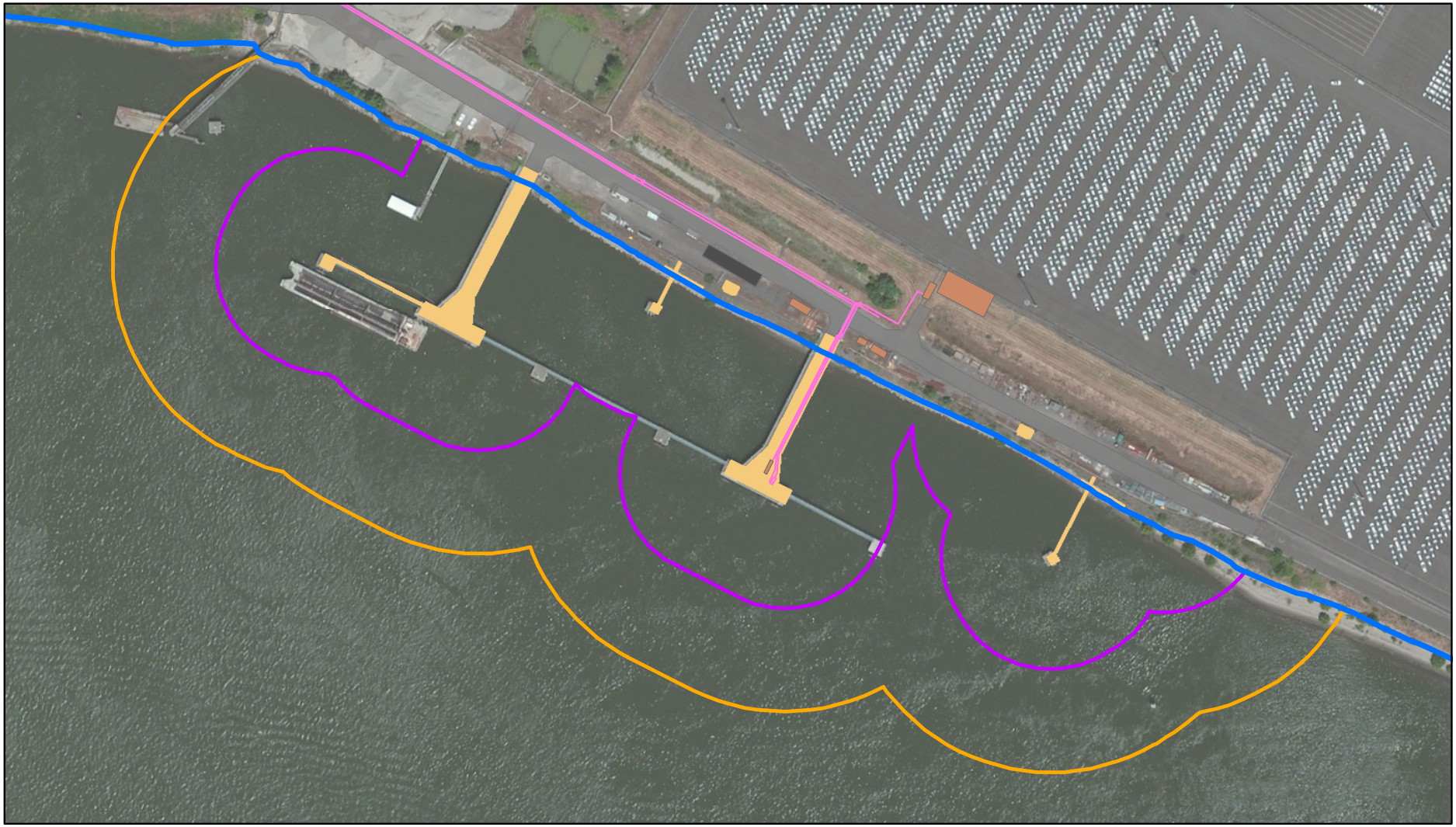

Figure 2 - Monitoring Locations

LEGEND

Proposed Project Facilities

- Transfer Pipeline
- Buildings
- Parking
- Roads
- Marine Terminal

- Ordinary High Water
- 150 Foot Early Warning Boundary
- 300 Foot Compliance Boundary

0 100 200 400

Feet

N

VANCOUVER ENERGY

Tesoro Savage Petroleum Terminal LLC

Date: February 2015

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

EX-0001-005534-PCE

3.2.2 Monitoring Depths

At each monitoring station, measurements of activity-appropriate water quality parameters will be made at three depths in the water column dependent on the river depth at the time of sampling. In shallow water depths, it will not be possible to collect all three measurements. In water depths less than 12 feet, only two depths will be monitored, and in water depths less than 6 feet, only one depth will be monitored.

Table 2. Monitoring Depth Summary

Measurement Location[a]	Shallow Depths (< 6 feet)	Depths < 12 feet	Depths > 12 feet
Surface	X	X	X
Middle			X
Bottom		X	X

[a] Measurement locations are defined as follows: Surface - within 3 feet (approximately 1 meter) of the water surface; Middle - at the mid-depth of the water column; Bottom - within 6 feet (approximately 2 meters) of the river bed

3.2.3 Monitoring Parameters

Real-time field measurements of the following water quality parameters will be collected during instrumented monitoring, as appropriate to the activity.

- Turbidity (in NTU)
- pH (in standard units)

3.2.4 Monitoring Schedule

Turbidity: In response to a visual observation of a turbidity plume, instrumented monitoring will be conducted immediately. If the result does not indicate an exceedance, no further monitoring is necessary and construction can resume. If the water quality standard is exceeded, a second sample will be conducted 30 minutes later. If the water quality standard remains exceeded, subsequent sample will be conducted at 30-minute intervals until the water quality standard is achieved.

Wet Concrete and Abutment Jet Grout Work: Monitoring will be undertaken once every 4 hours during active work.

If any exceedances of water quality criteria are observed at any time during the monitoring program and it is determined that the exceedance is caused by construction activities rather than an ambient background condition, then the contingency response and notification procedures will be initiated as described in section 4.

3.3 Record Keeping and Reporting

The designated Vancouver Energy representative or his/her designee will keep a written record of monitoring activities and inspections during both visual and instrumented monitoring. These records will be maintained in the Facility construction files and provided to EFSEC staff and any agency personnel designated by EFSEC to receive notifications. Daily monitoring logs will be kept by the designated Vancouver Energy representative. Daily logs will be compiled into weekly monitoring reports and notifications of water quality exceedances as described in detail below, which will be submitted to EFSEC.

3.3.1 Monitoring Reports

Daily monitoring logs will be kept throughout the duration of construction activities. Daily logs will include the following information. A sample daily monitoring log is included in Appendix A.

- Date and time of sample
- Sample location
- Sample results
- Monitoring type (i.e., visual or instrumented)
- Name of person collecting the sample
- Weather conditions
- Corrective actions needed/taken

Results of the water quality monitoring will be documented and submitted to EFSEC and any agency personnel designated by EFSEC on a weekly basis during construction. The weekly reports will contain summaries of the daily logs, and will be submitted to EFSEC within one week following the completion of each week of construction activities.

3.3.2 Notification of Exceedances

In the event of an exceedance of water quality standards, the attendant project personnel will immediately notify the designated Vancouver Energy representative, construction site environmental manager, or their designee, who will notify EFSEC and any other state agency personnel designated by EFSEC. Notification to EFSEC will be made within 24 hours of the occurrence, or the next business day if the violation occurs outside of normal business hours. A detailed written report will be submitted to EFSEC within five business days after the notification.

The report will include the following information. Appendix B contains a sample report template.

- Nature, extent, and duration of the water quality exceedance, including detailed visual observations and, if applicable, field parameter measurements
- Identification of the likely cause of the exceedance
- Description of control measures or BMPs implemented to mitigate the exceedance
- Notifications to agency, including timing and names of agency personnel contacted
- Documentation that control measures were effective at mitigating the water quality exceedance and stabilizing environmental conditions in the construction area

4. Contingency Response and Notification Plan

In the event of an exceedance of water quality standards, as observed during visual or instrumented monitoring, personnel will immediately assess the source of the impact or exceedance. Once the source has been identified, personnel will implement operational modifications or other control measures to prevent further occurrences and limit additional environmental impact. Monitoring will continue to confirm the control measures are effective and the observed water quality exceedances have been mitigated.

4.1 Visible Turbidity Plume

In the event a significant turbidity plume[5] is observed during visual monitoring of construction activities, construction operations and BMPs will be thoroughly inspected to identify the source of the turbidity exceedance, and appropriate operational controls, engineering controls, or enhanced BMPs will be

[5] A turbidity plume is considered significant when it extends the entire length of the area of mixing and remains visible 300 feet from the construction activity.

implemented to reduce turbidity to acceptable levels. Based on the shape and extent of the turbidity plume, it should be evident that the plume is sourced from a construction activity subject to this WQPMP rather than an anomalous background condition.

If a visible turbidity plume is evident at the compliance boundary, follow-up instrumented turbidity monitoring will be initiated to better assess compliance with water quality standards and to track the effectiveness of any supplemental controls or BMPs that may be implemented. Instrumented monitoring is described in the next section.

4.2 Instrumented Monitoring

Instrumented monitoring for turbidity, using a calibrated turbidimeter, will be implemented as a follow-up contingency measure in response to visual evidence of a significant turbidity plume or air bubbles observed during nearshore and abutment ground improvement installation. Instrumented monitoring for pH, using a hydroprobe or equivalent, will be implemented during overwater wet concrete work and during abutment ground improvement installation until the concrete is set.

Field measurements of turbidity and pH will be compared with the water quality criteria specified in Table 1 (see section 1.2). Compliance with water quality criteria will be evaluated at the Compliance Station locations described in section 3.2.1, which are parameter specific. If there is an exceedance of water quality criteria at the Compliance Station, the following sequence of events will be initiated.

1. Evaluate the concurrent measurements at the Background Station to determine whether the exceedance is caused by ambient river conditions versus site-related construction activities.
2. Retake field measurements 5 minutes later at the Compliance Station to confirm (or not confirm) the exceedance.
3. If the exceedance is confirmed and is attributed to site construction activities, immediately notify the contractor and designated Vancouver Energy representative. The contractor will be directed to immediately modify operations or implement additional BMPs to mitigate the exceedance.
4. Retake field measurements at the Compliance Station boundary within 30 minutes of the exceedance, after additional BMPs or operational modifications are implemented.
5. If the immediate response actions are not successful at mitigating the water quality exceedance within 30 minutes, the work will cease. The contractor and designated Vancouver Energy representative (or their designee) will assess the cause of the water quality problem and take immediate action to stop, contain, and correct the problem, and prevent further water quality exceedances. This may include implementing more aggressive BMPs and/or operational modifications.
6. Within 24 hours of occurrence, notify EFSEC of the exceedance (nature, extent, and duration), actions taken to mitigate the exceedance, and the results of the follow-up measurements.
7. Within five days after notification, submit a written report to EFSEC describing the exceedance, the mitigation measures implemented, and documentation of their effectiveness.

4.3 Overwater Concrete Work

If an exceedance of pH criteria is observed during overwater concrete work, the sequence of events specified in section 4.2 will be implemented. If the exceedance is confirmed and attributed to site construction activities, the contractor and designated Vancouver Energy representative or their designee will be notified and directed to modify operations or implement additional BMPs to mitigate the exceedance. The following contingency response actions will be initiated.

- Evaluate whether the BMPs identified in section 2.2 are in use and are functioning properly with no visible signs of concrete or concrete laden water leaving the work area. If BMPs are missing or installed improperly, the contractor will be directed to immediately stop the concrete work and install or fix the BMPs until they are functioning properly and pH levels are within the acceptable range.

- If BMPs are in place and functioning properly, all areas of concrete work will be evaluated for potential sources of pH exceedances. Additional BMPs or operational controls will be identified and implemented based on the source of the exceedances. Potential BMPs may include
  - Installation of tarps, work platforms or other methods to provide secondary containment for overwater concrete pours.
  - Placement of impermeable blankets to prevent precipitation from coming into contact with concrete until fully cured.

4.4 Construction Debris in Water

In the event of an observed release to the water of construction debris, the contractor will cease operations (if needed for safety) and recover the debris. Repairs to equipment, containment measures, or modification to work practices will be made prior to resuming work. Once the source has been identified and addressed, work may proceed. If the debris is environmentally innocuous (e.g., untreated wood, plastic, old concrete, and steel), work may proceed simultaneously with recovery efforts.

4.5 Distressed or Dying Fish

In the event distressed or dying fish are observed at the construction site and are attributed to site activities, work will immediately stop and EFSEC, the Washington Department of Fish and Wildlife (WDFW), and the National Marine Fisheries Service (NMFS) will be contacted at the numbers listed as follows.

- EFSEC at (phone number to be determined)
- WDFW at 360/906-6764
- NMFS Office of Law Enforcement at 503/231-6240 or 206/526-6133

The condition of the fish (dead, dying, or erratic behavior); an estimate of the number, species, and size of fish in each condition; and the location of fish relative to construction operations will be noted. If any dead listed species are present, samples will be frozen in secure storage under chain-of-custody for possible agency inspection. Additional fish and water sampling may be conducted at the direction of the resource agencies.

4.6 Nearshore and Abutment Ground Improvements

In the event that activities associated with installation of nearshore or abutment ground improvements result in turbidity or pH exceedances, notify EFSEC of the exceedance, actions taken to mitigate the exceedance, and the results of the follow-up measurements. If the turbidity or pH exceedance continues to persist in the discharge area, a path forward will be discussed with EFSEC. The path forward will likely include implementation of additional in-water and/or upland engineering controls, potentially including one or more of the following, depending on river conditions.

- Slowing the installation of jet or stone columns.
- Installation of a silt curtain to contain turbidity near the discharge area. Following installation of a silt curtain, the compliance monitoring location will move to the outside of the curtain.
- Installation of a fish diversion structure upstream of the discharge area. Following installation of a fish diversion structure, the compliance monitoring location will move to the boundary of the exclusion area, as projected downstream from the structure.
- Installation of additional wick drains on the uplands to further alleviate excess pore pressure on the bank of the river.
- Rotation of column installation sites, from forward to back, to minimize the temporal impacts of installation at the locations nearest the water.

4.7 Discharge of Oil, Fuel, or Chemicals

In the event of a discharge of oil, fuel, or chemicals (including wet concrete) into state waters, work will stop and containment and cleanup efforts will begin immediately and be completed as soon as possible. Work may resume only after the source of the spill or leak has been identified and controlled, as long as the work does not interfere with, delay, or hinder the containment and cleanup efforts. Cleanup includes appropriate disposal of any spilled material and cleanup material. The following agencies will be immediately notified.

- EFSEC at (phone number to be determined)
- Ecology's Spill Response Office at 360/407-6300
- Washington State Emergency Management at 800/258-5990 (24-hour)
- National Response Center at 800/424-8802 (24-hour)

5. List of Acronyms and Abbreviations

bbl: barrel or barrels

BMPs: best management practices

Ecology: Washington State Department of Ecology

EFSEC: Energy Facility Site Evaluation Council

Facility: Vancouver Energy

NMFS: National Marine Fisheries Service

NTU: nephelometric turbidity unit

OHWM: ordinary high water mark

Port: Port of Vancouver USA

RCW: Revised Code of Washington

RM 103.5: River Mile 103.5

SPCCP: spill prevention, control, and countermeasures plan

SWPPP: stormwater pollution prevention plan

WAC: Washington Administrative Code

WDFW: Washington Department of Fish and Wildlife

WQPMP: water quality protection and monitoring plan

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Vancouver Energy
Water Quality Protection and Monitoring Plan
EFSEC Application for Site Certification No. 2013-01
Docket No. EF131590

Appendix A
Sample Daily Monitoring Log

Appendix A - Water Quality Monitoring Daily Log

Date	Name	Method	Background Station		Early Warning Station		Compliance Station		Weather	Corrective Actions Needed/Taken
			Time	Reading	Time	Reading	Time	Reading		

Vancouver Energy
Water Quality Protection and Monitoring Plan

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

Appendix B
Sample Report Template

Appendix B, Sample Report Template

1. Introduction

Vancouver Energy (Facility) provides transloading services for pipeline quality crude oil from railcars to marine vessels. The Facility is located at 5501 NW Old Lower River Road, Vancouver, Washington; it is situated at the Port of Vancouver USA (Port) on the north bank of the Columbia River at approximately River Mile 103.5 (RM 103.5). Construction of the Facility started [date] in accordance with approved construction plans. Weekly monitoring reports have been submitted to Energy Facility Site Evaluation Council (EFSEC) to document compliance with water quality standards.

2. Water Quality Exceedance

On [date], a water quality exceedance for [parameter] was detected during routine monitoring of water quality during construction. The following section summarize the nature and source of the violoation.

2.1 Location

Nature, extent, and duration of the water quality exceedance, including detailed visual observations and, if applicable, field parameter measurements

Identification of the likely cause of the exceedance.

2.2 Contigency Response Actions

Describe work stoppage procedures and immediation action, if any, taken to minimize further violation.

Describe notifications to agency, including timing and names of agency personnel contacted.

2.3 Corrective Action

Description of control measures or best management practices (BMPs) implemented to mitigate the exceedance.

Documentation that control measures were effective at mitigating the water quality exceedance and stabilizing environmental conditions in the construction area.