



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

Memorandum

**CLEAN WATER ACT §401 SUBSTANTIVE WATER QUALITY REQUIREMENTS
FOR THE TERMINAL 117 CERCLA ACTION**

June 25, 2013

I. Introduction

This Clean Water Act §401 Substantive Water Quality Requirements Memorandum (401 Memo) documents the United States Environmental Protection Agency's (EPA) determination that the in-water activities of the Terminal 117 Early Action Area (T-117 EAA or Site) Removal Action meets the substantive requirements of the Clean Water Act §401 (CWA § 401). The activities covered in this evaluation of substantive compliance include the following: sheetpile wall installation/excavation behind the wall; removal of contaminated marine sediment and bank material; placement of bank material and sediment backfill; in-water debris and pile removal; pile driving; and operation of a surface water treatment system. The remediation of the Site will be conducted as a non-time-critical removal action (NTCRA) in accordance with EPA's selected cleanup alternative documented in the Action Memorandum for a Non-Time-Critical Removal Action at the Terminal 117 (T-117) Upland and Sediment cleanup areas (Action Memo; EPA 2010) and detailed in the Final Engineering Evaluation/Cost Analysis (EE/CA) T-117 Facility, 8700 Dallas Avenue South, Seattle, Washington (AECOM 2010).

The Removal Action will address approximately 2.1 acres of contaminated sediments and 3.3 acres of upland soils. A copy of this 401 Memo and any future amendments will be placed in the Site File. In addition, copies of this original memorandum and any future amendments shall be kept on the job site and made readily available for reference by EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

The EPA is responsible for review of this project to ensure compliance with the substantive requirements of the CWA §401. We have drawn heavily on the State of Washington water quality standards (Chapter 173-201A WAC) in our evaluation, these standards being normally applicable and used by the State of Washington for CWA § 401 certification in the absence of a CERCLA action. The anti-degradation policy of the State of Washington, in addition to preservation of beneficial uses, is a factor in our analysis. While the State of Washington has no certification authority regarding this Removal Action, EPA has coordinated with the Washington State Department of Ecology, the designated water quality agency for the State of Washington.

This finding of compliance with CWA §401 is based on our review of the project final remedial design documents, including the final Design Report (dated October 2012) and the Removal Action Work Plan (RAWP, June 2013) which includes the, Erosion and Sedimentation Control Plan, and Construction Water Management Plan. An update to the Water Quality Monitoring Plan (WQMP) is in preparation and will be reviewed and approved by EPA. The WQMP serves as the overall water quality monitoring plan for the project, though conditions of this 401 Memo shall supersede the WQMP when specifications conflict between the two documents. Should new or more specific information become available during planning and during implementation of the project, a revised/amended 401 Memo will be prepared by the EPA, if necessary.

II. Removal Action

Details of each project component are described in the referenced support documents. The following is a brief summary of the site and relevant actions.

Construction activities planned as part of the T-117 Upland and Sediment removal action to which this 401 Memo applies include the following:

- upland soil and bank removal,
- water treatment plant discharges,
- sheetpile wall installation and excavation behind the wall,
- sediment dredging,
- in-water debris and pile removal,
- pile driving, and
- in-water placement of backfill and shoreline materials.

The purpose of this removal action is the excavation of 33,000 cubic yards (cy) of upland and bank soil containing elevated concentrations of total PCBs above the removal action level (RvAL) of 1 part per million (ppm), and dredging of 8,100 cy of surface and subsurface sediments containing elevated concentrations of total PCBs above the RvAL of 12 milligrams per kilogram of organic carbon (mg/kg-OC).

Approximately 1,000 linear feet of shoreline bank will be excavated to remove impacted nearshore soils and sediments, followed by the placement of a backfill to restore grade. The proposed shoreline reconfiguration extends from the top of the existing bank at approximately +20 feet MLLW down to -13 feet MLLW elevation. While every effort will be made to perform the bank excavation and backfill activities from the landside and “in the dry” during low tides, some of the shoreline work at lower elevations will occur during times when the area is inundated and are thus covered by this 401 Memo.

In addition to sediment/soil removal, a sheetpile wall (24-inches wide by 300-feet long along the shoreline and extends 300 feet into the upland) will be installed in order to minimize the movement of contaminated surface water and soil associated with excavation to the Lower

Duwamish Waterway (LDW). In-water debris and pilings (83) will be removed and new pilings (10) will be installed.

A 200-size excavator and long reach excavators will be used for excavation of saturated upland and bank subtitle D and subtitle C soil (approximately 5,000 cy are below the groundwater table). This material will be placed into off-road haul trucks and transported to the soil stockpile area to drain. A 7.5 cubic yard (cy) square nose re-handle bucket, a 7.5 cy environmental-level bucket and a 5-cy round-nose digging bucket will be used for sediment dredging. The environmental bucket will be used whenever possible to help keep turbidity levels low and dredging rates will be slowed or modified to reduce turbidity if found to be out of compliance values. The excavated soils, dredged sediments and debris/pilings will be disposed of at an EPA-approved Subtitle D and/or Subtitle C landfill. The excavation depths vary from an elevation of 0 to +20 feet MLLW. The dredging depths vary from 0 to -13 feet MLLW with an over dredge tolerance of 2 feet.

A Chitosan Enhanced Sand Filtration (CESF) water treatment system will be installed and managed on-site to treat all collected site stormwater, stockpile dewatering, decontamination fluids and any required sump or excavation dewatering to maintain discharge compliance with the Department of Ecology NPDES permit as well as the Water Quality Memo. The CESF system will include solids removal, oil/water separation, granulated activated carbon filtration, pH neutralization and dissolved oxygen treatment as necessary.

Following dredging, the removal areas will be backfilled with clean import material to bring the area generally back to its approximate original grade. If incidental dredging occurs in the federally authorized navigation channel, no backfill will be placed. Additionally, portions of the South Park Marina ingress/egress channel will only be backfilled to the marina's permitted dredge depth of -8 ft MLLW.

III. Conditions of Substantive Compliance

As documented in this 401 Memo, EPA finds that it has reasonable assurance that the discharges associated with the Early Action removal at the T-117 Site as proposed and conditioned will be in substantive compliance with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended and other appropriate requirements of Washington State Law. This finding of compliance with the substantive requirements of the CWA §401 Water Quality Certification is subject to the following terms and conditions:

A. General Conditions

1. Expiration and Amendment

- a. This 401 Memo shall become effective on the date it is signed and shall remain valid for one construction season, expiring June 21, 2014, unless specifically extended by EPA through amendment. In-water construction activities, including dredging, debris and pile removal, backfilling of dredge area, and pile placement, will be

prohibited between February 15th and August 15th of any year, unless timing extensions are specifically coordinated and approved by the appropriate resource agencies. Sheet pile wall installation, bank removal and backfill, and discharge from the surface water treatment plant can occur on or after June 15.

- b. Prior to expiration, this 401 Memo may be amended if there are significant additions, changes, modifications, and revisions to the Design Report, RAWP, or the WQMP.
- c. The EPA contact person for amendments, modifications, approvals, or any other changes to this 401 Memo is Erika Hoffman (hoffman.erika@epa.gov), Environmental Review & Sediment Management Unit, Washington Operations Office (WOO) at (360) 753-9540. Surface mail correspondence should be addressed to WOO, 300 Desmond Drive SE, Suite 102, Lacey, Washington 98503.

2. Reporting

- a. The EPA must be notified as soon as possible and within 24 hours of any water quality criteria exceedance or failure to comply with conditions of this 401 Memo. Reporting frequencies are detailed below. Typically, the EPA Remedial Project Manager (RPM) will be notified first and the RPM will then immediately notify the EPA Water Quality Specialist (WQS); however, the reverse may occur.

EPA Remedial Project Manager (RPM): Piper Peterson (206) 553-4951;
peterson.piper@epa.gov

EPA Water Quality Specialist (WQS): Erika Hoffman, (360)753-9540;
hoffman.erika@epa.gov

- b. Pre-project: EPA's RPM shall be notified at least 2 weeks prior to the commencement of removal activities.

Daily reporting: Any water quality exceedances will be reported verbally or by e-mail to the EPA Remedial Project Manager within 24 hours.

- c. Weekly reporting: Results from each week's Water Quality Monitoring Forms will be compiled into a summary table and provided electronically to EPA with the Weekly Progress Report. The exception to weekly reporting is the exceedance of a condition from this Memorandum, which must follow the reporting sequence outlined in Section 18 of the RAWP.
- d. Final project report: Once all construction is complete, results for the entire construction period will be compiled and reported to EPA along with supporting documentation in the Water Quality Monitoring Report as part of the Removal Action Completion Report. At a minimum, the report must include, but not be limited to, the following information:

- i. A description of field sampling activities and a plan view of monitoring locations relative to the location of removal actions;
- ii. Any deviations from this Memorandum and reasons for the deviations;
- iii. Description of changes or contingency BMP's implemented to avoid or address water quality impacts;
- iv. A summary of field observations, including sampling times, weather conditions, water conditions, silt plumes, distressed/dying fish, and any relevant anecdotal or unusual observations;
- v. Narrative and tabular text presenting results of water quality monitoring related to each operation;
- vi. Discussion of water quality exceedances and any additional monitoring that may have resulted including rationale for selection/location of additional stations and/or discretionary samples;
- vii. Data quality review results based on calibration and precision/accuracy information, including any data qualifiers and reasons for those qualifiers ;
- viii. An appendix containing all completed water quality monitoring sample forms;
- ix. An appendix containing all calibration information ;
- x. A list of all of the best management practices (BMPs) related to water quality that were employed during the project implementation, when and why those were used, and an assessment of the effectiveness of those BMPs.

3. Incorporation of other documents by reference

The Final Design Report and RAWP discuss potential concerns associated with each segment of construction, potential remedies and contingencies, best management practices, as well as inspection and monitoring associated with each element of this project. These are incorporated by reference.

4. Fish Window Timing

In order to minimize potential chemical and physical impacts from suspended sediments to out-migrating juvenile salmonids utilizing the nearshore environment for migration and feeding, project in-water construction activities will be prohibited between February 15th and June 15th of 2013 for this project, specifically. Dredging and pile and debris removal and pile driving will be prohibited February 15th to August 15th of 2013 for this project specifically. Sheet-piles associated with the containment wall may be driven using vibratory methods between June 15 and August 15, 2013.

B. Water Quality and Water Quality Monitoring

1. Compliance Standards

The State of Washington Marine Acute and Chronic water quality criteria for the protection of aquatic life, found within the water quality standards (WQS), shall apply for all dredging, dredged material dewatering and any other in-water activities (e.g., any

shoreline excavation and debris removal not performed “in the dry”) (WAC Chapter 173-201A-240). Conventional parameters will comply with the water quality performance criteria for the “excellent quality” marine waters of the Duwamish River (WAC 173-201A-210) except at the points of compliance (as defined in Section 5). All other applicable water quality criteria shall remain in effect within the applicable points of compliance, and all water quality criteria are to be met outside of the authorized points of compliance.

2. **Dissolved Oxygen**

At the 150-foot point of compliance, DO shall exceed 6.0 mg/L. If background DO is lower than this criterion due to natural conditions, then the background condition minus 0.2 mg/L will replace the criterion (only for that period that background DO is lower). This standard is waived within the 150-foot point of compliance but at no time should dissolved oxygen drop below 3.5 mg/L within the 150-foot point of compliance. Should this occur, all in-water activities should cease immediately and EPA shall be notified. Work shall not recommence until dissolved oxygen levels have returned to ambient levels and approval has been given by EPA.

3. **Turbidity**

At the 150-foot point of compliance, turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

4. **Temperature**

If the receiving water temperature is greater than 16°C (or within 0.3°C of 16°C) due to natural conditions, then no incremental increase of more than 0.3°C (over a 7-day average of daily maximum temperatures) is allowed at the 150-foot point of compliance.

If the receiving water temperature is less than 16°C (or more than 0.3°C below 16°C – i.e., less than 15.7°C), then incremental temperature increases must not, at any time, exceed a temperature defined as $12/(T-2)$ as measured at the 150-foot compliance zone boundary, where “T” is the highest ambient background in the vicinity (°C).

5. **pH**

The pH at the 150-foot compliance zone boundary must be within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

6. Contaminants of Concern

The T-117 site COCs for sediments are arsenic, PAHs, phenol, total PCBs and dioxins/furans. Measurement of these COCs will be required for monitoring associated with in-water activities, although WQS are only available for arsenic and PCBs (Table 1).

The site COCs in upland soils and groundwater are arsenic, silver, cPAH TEQ, total PCBs, TPH, BEHP, and dioxins/furans. Measurement of these COCs (as well as the standard suite of trace metals) is required for monitoring of construction water treatment plant discharge.

At the designated point of compliance (see Section 7), the following acute and chronic Water Quality Criteria will apply:

Table 1: COCs with Applicable Marine WQS

Analyte	Marine Water Quality Standards ^{ab} (µg/L)	
	Acute	Chronic
PCBs ^c	10	0.03
Arsenic ^c	69	36
Cadmium ^d	40	8.8
Chromium ^d	1100	50
Copper ^d	4.8	3.1
Lead ^d	210	8.1
Mercury ^d	1.8	0.025
Silver ^d	1.9	---
Zinc ^d	90	81

^a Standards listed are the lowest of National Recommended Water Quality Criteria: Aquatic Life Criteria. U.S. EPA or Water Quality Standards for Surface Waters of the State of Washington.

^b All WQS for trace metals are expressed in terms of the dissolved fraction.

^c PCBs and arsenic are among the suite of COCs for both in-water construction and treatment plant discharge monitoring.

^d Trace metals (aside from arsenic) are among the suite of COCs for treatment plant discharge monitoring only.

If conventional or chemical water quality criteria are exceeded at the applicable point of compliance, the steps outlined in Section 18.2. of the WQMP must be followed.

7. Points of Compliance

Per WAC 173-201A this memo establishes the following Points of Compliance for this project (Table 2):

Table 2: Applicable Points of Compliance

Activity	Standards	Point of Compliance
In-water dredging	Acute ^a and Conventional ^b parameters	150-ft radius from dredging location
In-water dredging	Chronic ^a parameters	300-ft radius from dredging location
Barge dewatering ^c	Acute and Conventional parameters	150-ft radius from dewatering location
Barge dewatering ^c	Chronic parameters	300-ft radius from dewatering location
Other in-water construction (i.e., debris removal, submerged shoreline excavation)	Acute and Conventional parameters	150-ft radius from dredging location
Other in-water construction (i.e., debris removal, submerged shoreline excavation)	Chronic parameters	300-ft radius from activity location
In-water backfill placement	Conventional parameters	150-ft from placement location
Surface water treatment plant discharge	Chronic and conventional parameters	End of pipe (prior to discharge)

^a Acute and chronic substances criteria as specified in Table 1 and Section 6.

^b Conventionals include turbidity, dissolved oxygen, pH, and temperature. While the compliance boundary for conventional parameters is 150-ft, conventional testing will also be conducted at 300-ft.

^c Separate monitoring of barge dewatering is only required if dewatering and removal activities are more than 150-ft apart.

8. Water Quality Monitoring

EPA has approved the Removal Design Report and the RAWP, this document is incorporated by reference as condition of this 401 Memo. Additional modifications to the WQMP (in progress) as well as revisions to the RAWP by the contractor selected to do the work shall require prior notification to and approval by EPA. Salient elements of the required monitoring for in-water activities are summarized below (See Section F for a description of monitoring associated with the surface water treatment discharge).

Timing, frequency, and type of monitoring are keyed to the particular in-water activity as described in the WQMP (Table 18-1, subject to revision). The schedule is divided into two tiers for all in-water work. Tier 1 Field Monitoring for Conventional Parameters (turbidity, dissolved oxygen, pH and temperature) will occur at least twice daily during certain in-water activities, such as dredging (1-2 hours following a tide reversal on either an ebb tide or a flood tide) at the activity-specific frequency shown in Table 18-1 (subject to revision) and Section 18.2 of the RAWP. Each reading will be taken from 3 types of stations: a background station

at least 100 feet up-current from the Sediment Area boundary, the edge of the 150-foot compliance zone (up-current and down-current) and the edge of the 300-foot compliance zone up-current and down-current from activity. The compliance zone boundaries will vary depending upon the location of the activity (e.g., these distances will be measured from the center point of the activity being conducted). Background/upstream readings will be recorded just prior to the recording of the compliance readings.

Tier II monitoring involves collections and expedited laboratory analysis of water samples for total suspended solids (TSS), PCB Aroclors, PAHs, dioxins/furans, dissolved arsenic, and phenol. Sample collection will be conducted at the frequency in Table 18-1 (subject to revision), both in response to Tier 1 exceedances and, for particular activities such as dredging, at a determined frequency independent of Tier 1 results. Samples will be collected from both up-current and down-current locations at the compliance and background stations and at the two depths used for Tier 1 monitoring. The chemical compliance criteria at 150 feet from the in-water activity will be the acute criteria and the compliance criteria at 300 feet will be the chronic criteria (see Table 1). For compliance purposes, the concentrations of COCs that are compared to the water quality standards may be averages of samples collected at a compliance boundary over space (up-current and down-current) and/or over time (depending on the appropriate averaging period for the standard in question may be 1-hr, 24-hr or 4-day average).

The timing of monitoring are intended to be representative of conditions during a given work day and to capture potential worst-case conditions for suspended sediments. During active dredging, it is expected that worst-case conditions will occur approximately 1-2 hours after a tide reversal. This is because a suspended sediment plume moving in one direction prior to the reversal will be superimposed on the plume being generated by ongoing dredging. During dewatering, worst-case effluent conditions will depend on the way dredging is proceeding, how well the barge de-watering system is operating, and how much water is mixed with sediment during dredging. The person directing field sampling must use discretion when determining timing of sampling on any given day, capturing worst-case operational conditions for dredging and dewatering, and doing so approximately 1-2 hours following tide reversal on a flood or ebb tide.

In-water activities automatically requiring water quality monitoring are:

- In-Water constructions (including sheet pile wall installation, dredging, debris removal, pile removal, pile driving) with the exception of work in the dry.
- Barge de-watering (can be covered by monitoring for dredging as long as activities are within 150 ft of each other).
- Submerged Shoreline Bank Excavation
- Backfill in dredged areas
- Water treatment plant discharge to surface water

Five types of water quality sampling stations are defined as follows:

- One ambient station located outside the influence of project activities (location changes depending on tide).

- 150-foot compliance stations located upriver and downriver from the construction work area.
- 300-foot compliance stations located upriver and downriver from the construction work area.
- End of pipe samples associated with the surface water treatment plant discharges (See Section F below).
- Discretionary stations may be necessary if the compliance station indicates water quality exceedances are occurring. The rationale for taking discretionary stations should be clearly indicated in field notes. Discretionary stations can be used to track and document the nature and extent of any plume associated with exceedances as well as identify the source of a plume or exceedance.

Water quality measurements/samples will be taken at two sampling depths: near-surface (approx 2-ft below the water surface) and near-bottom (approx. 2-ft above mudline).

9. Water Quality Exceedance

In the event the water quality monitoring field staff detect an exceedance of turbidity or DO standards at a 150-ft compliance monitoring station (or 300-ft station) or if water grab sample chemistry results detect an exceedance of the acute or chronic criteria for a COC, the Water Quality Response Mechanisms sequence must be followed (summarized below).

- Alert the quality assurance officer and EPA following receipt of confirmed field results or lab results as soon as possible and within 24 hours.
- For field results, compare compliance boundary data to that from the upstream ambient station to evaluate whether concentrations may be elevated as a result of the Removal Action, or may reflect area-wide water quality conditions. Removal Action operations may continue during this review.
- For lab results, initiate analysis of appropriate archived sample(s) to evaluate instantaneous, 1-hr averaged, 24-hr averaged or 4-day concentrations relative to compliance.
- Removal action operations may continue, may be altered, or may be halted pending the results of the additional testing. After receipt of the follow-up testing results, the contractor will assemble a list of recommendations for addressing any confirmed exceedance(s).
- The Quality Assurance Officer (QAO) and EPA will be notified of follow-up testing results. If concentrations in the follow-up monitoring indicate continuing exceedances of water quality criteria caused by the Removal Action, the QAO, the Resident Engineer and EPA will confer concerning additional sampling and implementation of operational controls.

10. Effects on Fish

If during in-water activities, distressed and/or dying fish are observed in the construction vicinity, EPA must be immediately notified of the condition. The operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, have the water samples analyzed for dissolved oxygen and total sulfides. For distressed or dying fish the following, at a minimum, will be noted:

- Condition of fish (dead, dying, decaying, erratic or unusual behavior)
- Number, species, and size of fish in each condition
- Location of fish relative to operations
- Presence of any apparently healthy fish in the area at the same time
- Whether the species is a listed species

Additional water quality measurements may need to be taken at the discretion of the QAO and EPA, and are intended to define the area of impact and assess the situation to allow informed decisions. The cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates, modify work schedule, perform work on a slack tide, etc.) will be taken to correct an identified problem.

11. Silt Plume

If routine water quality monitoring is not being performed during in-water activities and a silt plume is observed in the vicinity of construction operations, EPA must be immediately notified and decisions regarding additional water quality monitoring coordinated. Any additional water quality measurements will be taken at the discretion of the Quality Assurance Official and EPA, and are intended to define the area of impact and assess the situation to allow informed decisions. The cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates, modify work schedule, perform work on a slack tide, etc.) will be taken to correct an identified problem if project operations are determined to be the source.

C. Dredging, Debris/Pile Removal, Pile Driving and Disposal

1. All dredging is to be done using a dredge with an enclosed environmental bucket, or conventional digging bucket where there is large debris or pilings that cannot be removed with the environmental bucket.
2. Dredged/excavated materials generated for the project will be disposed at permitted solid waste landfills in accordance with State and Federal solid and hazardous waste regulations.

3. Dredged material shall not be stockpiled on a temporary or permanent basis below the ordinary high water line.

Reasonable precautions and controls must be used to minimize the disturbance or siltation of adjacent waters and prevent incidental and accidental discharges of petroleum products or other deleterious or toxic materials from entering the water as a result of any in-water activities. Materials such as sorbent pads and booms must be available on-site and must be used to contain and clean up petroleum product spilled as a result of the in-water activities. If significant oil sheen is observed immediate corrective actions must be taken to modify the operation to prevent further degradation, or the activity must cease. EPA must be notified of the situation.

D. Dredging Return Water Handling

1. Water associated with dredging will be pumped from sediment haul barges to an on-barge treatment system using geobags to remove excess sediment and associated contaminants prior to discharging back to the LDW (as described in the RAWP).
2. Discharge water must comply with turbidity and COC criteria as measured at the 150-foot and 300-foot points of compliance.

E. Placement of Backfill

Clean, sandy material must be used, which is free from fines and suspendable material to the extent practicable, and free from contamination by petroleum products or toxic substances in toxic amounts. Prior to placement of the backfill material, the EPA Project Manager must be provided with information regarding the location/source of the material and detailed specifications of this material, including chemistry and grain size information, and approve its suitability as a clean backfill material.

F. Construction Water Treatment Plant

In addition to the requirements for the site-wide activities discussed above, this section covers the discharge of construction related water (contaminated groundwater, soil contact water and contact storm water collected and treated from the T-117 Upland Removal action in the Lower Duwamish Waterway. The discharge water must meet the substantive requirements of Clean Water Act and subsequently meet the requirements of National Pollution Discharge and Elimination System (NPDES) permits for discharge to surface water.

The Construction Water Management Plan (CWMP) covers the design, operation, maintenance, monitoring and regulatory reporting associated with the CESF system discharge (Section 12, RAWP). Section 12.4 identifies the water quality sampling locations, tests, performed, rate of testing and discharge limits. The compliance point is at the end of the pipe and discharge point for the water treatment system is the Lower Duwamish

Waterway (LDW), all discharge will be in compliance with the Water Discharge Criteria listed in Table 3 (below).

1. The following numeric limits apply to this discharge. The point of compliance for these numeric limits is final effluent (end of pipe). Additional samples may be archived for future chemical monitoring to calculate a more representative average and to verify compliance with the limits.

Table 3: Water Discharge Criteria

Conventional Parameter	Discharge Limit ¹	
pH	8.5 (maximum) 7.0 (minimum)	
Turbidity	10 NTU* (maximum) 5 NTU above background	
Dissolved Oxygen	6 mg/L (minimum)	
Oil sheen	No sheen observed	
Chemical Parameter	Discharge Limit ^{1,2}	
	Sample maximum ³	Average ⁴
Total PCBs (as Aroclors)	10 ug/L	0.03 ug/L
Arsenic	69 ug/L	36 ug/L
Cadmium	40 ug/L	8.8 ug/L
Chromium	1100 ug/L	50 ug/L
Copper	4.8 ug/L	3.1 ug/L
Lead	210 ug/L	8.1 ug/L
Mercury	1.8 ug/L	0.025 ug/L
Nickel	74 ug/L	8.2 ug/L
Silver	1.9 ug/L	-
Zinc	90 ug/L	81 ug/L

¹ The discharge must comply with both limits (sample maximum and average). If there is only one sample taken during an averaging period (e.g. 4 day for metals), the sample result must meet the most stringent limit (e.g. average in this case).

² Chemical discharge limits are based on the lowest of National Recommended Water Quality Criteria: Aquatic Life Criteria. U.S. EPA or Water Quality Standards for Surface Waters of the State of Washington. Dissolved metals will be analyzed

³ This limit is based on acute water quality criteria for Marine waters, which is 1 hour average for most parameters except for total PCBs which is 24 hour average.

⁴ This limit is based on chronic water quality criteria for Marine waters, which is calculated as 4 day average for most parameters except for total PCBs which is 24 hour average.

* This limit is based on technology.

2. The discharge must comply with the following standards:
 - a. Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), ground water quality standards (Chapter 173-200 WAC), and sediment management standards (Chapter 173-204 WAC). Discharges not in compliance with these standards are not authorized.

3. Prior to the discharge of stormwater and non-stormwater to waters of the State, the Port must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this 401 Memo. This is documented in the Pollution Prevention Plan and the Sediment and Erosion Control Plan
 - a. EPA presumes that the Port complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Port complies with the following conditions. The Port must fully:
 - i. Comply with all conditions of this 401 Memo.
 - ii. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater technical manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control.
 - iii. Comply with the construction water management plan as part of the EPA approved removal action work plan (RAWP), including planning, sampling, monitoring, reporting, and recordkeeping conditions.

4. At a minimum, the Port must monitor the final effluent from the treatment system per the frequencies given in Table 4. If additional monitoring is conducted, the data must be reported to EPA.

Table 4: Monitoring Parameters and Schedule

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type	Analytical Method
Final Effluent (Conventional)				
Flow volume	gallons	Continuous	Online data	-
Flow duration	hours	Continuous	Online data	-
Turbidity	NTU	Twice Daily	Grab	EPA 180.1/ SM2130
pH	Standard units	Twice Daily	Grab	SM4500-H ⁺ B
Dissolved Oxygen	mg/L	Twice Daily	Grab	SM4500- OC/OG
Temperature	°C	Twice Daily	Grab	Field Method
Oil sheen	-	Daily	Grab	Visual

Parameter	Units & Speciation	Minimum Sampling Frequency	Sample Type	Analytical Method
				Observation
Total Suspended Solids (TSS)	mg/L	Weekly	Grab	EPA 160.2/ SM2540-D
Effluent from 1st Granular Activated Carbon unit to check breakthrough (Chemical)				
Total PCBs (as Aroclors)	ug/L	Weekly	Grab	EPA 8082
Final Effluent (Chemical)				
Total PCBs (as Aroclors)	ug/L	Weekly	Grab	EPA 8082
Arsenic	ug/L	Weekly	Grab	EPA 200.8
Cadmium	ug/L	Weekly	Grab	EPA 200.8
Chromium	ug/L	Weekly	Grab	EPA 200.8
Copper	ug/L	Weekly	Grab	EPA 200.8
Lead	ug/L	Weekly	Grab	EPA 200.8
Mercury	ug/L	Weekly	Grab	EPA 245.7/ 1631E
Nickel	ug/L	Weekly	Grab	EPA 200.8
Silver	ug/L	Weekly	Grab	EPA 200.8
Zinc	ug/L	Weekly	Grab	EPA 200.8
BEHP	ug/L	Twice during NTCRA	Grab	EPA 8270
cPAHs	ug/L	Twice during NTCRA	Grab	EPA 8270 SIM
Dioxins/Furans	pg/L	Twice during NTCRA	Grab	EPA 1613B
TPH -Dx	mg/L	Twice during NTCRA	Grab	NWTPH Dx
Residual Chitosan	mg/L	Daily	grab	Field Method
Whole Effluent Toxicity (WET) – Chronic bioassay [#]	-	Twice during NTCRA	Grab/24 hour composite	See below [#]

[#] See Table 5

Table 5: WET Test Methods

Saltwater Chronic Test	Species	Method
Topsmelt survival and growth	<i>Atherinops affinis</i>	EPA/600/R-95/136
Mysid shrimp survival and growth	<i>Americamysis bahia</i> (formerly <i>Mysidopsis bahia</i>)	EPA-821-R-02-014
Sea urchin/ Sand dollar fertilization	<i>Strongylocentrotus purpuratus</i> / <i>Dendraster excentricus</i>	EPA/600/R-95/136

5. In the event the Port is unable to comply with any part of the terms and conditions of this 401 Memo, and the resulting noncompliance may cause a threat to human health or the environment, the Port must notify EPA immediately, and:
 - a. The Port must take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately.
 - b. The Port must notify EPA of any exceedances detected through water quality monitoring within 24 hours of the occurrence. The Port must, at a minimum, provide the following information:
 - i. A description of the noncompliance and its cause.
 - ii. The period of noncompliance, including exact dates and times.
 - iii. The estimated time noncompliance is expected to continue if not yet corrected.
 - iv. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
 - v. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.
 - c. In addition to the 24 hour notification, the Port must submit a written report to EPA that describes the nature of the exceedance, sampling results and location, photographs, and any other pertinent information within five (5) days after the exceedance. The report shall also identify what additional BMPs were, or will be, implemented to prevent further exceedances. If any monitoring results (follow up or other) are not available within five (5) days of any exceedances, a follow up report must be submitted when monitoring results are available but no later than two weeks.
 - d. If monitoring results demonstrate that the applicable water quality standards or project performance standards are not being met, EPA may require additional monitoring and/or mitigation.

6. The Port must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this 401 Memo. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the Port to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this 401 Memo.
 - a. Approval of Construction Stormwater Chemical Treatment System- The Port has been approved to use of the proposed Chitosan Enhanced Sand Filtration (CESF) water treatment system per BMP C250 of the Western Washington Stormwater Management Manual (2012). The CESF water treatment system is included in the RAWP. The CESF water treatment system must be operated per the terms and conditions of the General Use Level Designation (GULD).
 - b. Certified Operator - The CESF water treatment system must be operated by a trained technician certified through an Ecology-approved training program that includes classroom and field instruction. The technician must have current certification as a Certified Erosion and Sediment Control Lead (CESCL), through an Ecology-approved CESCL training course. The CESF operator must remain on-site during CESF operation.
7. The Port must demonstrate substantive compliance with prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) or its equivalent for construction activity in accordance with the requirements of the Stormwater Management Manual for Western Washington (2012). This is documented in the Pollution Prevention Plan and the Sediment and Erosion Control Plan.
 - a. The SWPPP Objectives are as follows:
 - i. To implement best management practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.
 - ii. To prevent violations of surface water quality, ground water quality, or sediment management standards.
 - iii. To control peak volumetric flow rates and velocities of stormwater discharges
 - b. The Port must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the EPA determines it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Port must modify the SWPPP whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

- c. Stormwater Best Management Practices (BMPs) must be consistent with Stormwater Management Manual for Western Washington (2012), or documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the Stormwater Management Manual.
- d. The Port must include each of the 12 elements (13 elements if required by the local jurisdiction) of the SWPPP Narrative Requirements per the Volume II of the Stormwater Management Manual for Western Washington (2012) in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP. The 13 elements are:
 - i. Preserve Vegetation/Mark Clearing Limits
 - ii. Establish Construction Access
 - iii. Control Flow Rates
 - iv. Install Sediment Controls
 - v. Stabilize Soils
 - vi. Protect Slopes
 - vii. Protect Drain Inlets
 - viii. Stabilize Channels and Outlets
 - ix. Control Pollutants
 - x. Control Dewatering
 - xi. Maintain BMPs
 - xii. Manage the Project
 - xiii. Protect Low Impact Development BMPs
- e. The SWPPP must include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions:
 - i. The direction of north, property lines, and existing structures and roads.
 - ii. Cut and fill slopes indicating the top and bottom of slope catch lines.
 - iii. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
 - iv. Areas of soil disturbance and areas that will not be disturbed.
 - v. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.
 - vi. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.
 - vii. Locations of all surface water bodies, including wetlands.
 - viii. Locations where stormwater or non-stormwater discharges off-site and/or to a surface water body, including wetlands.
 - ix. Location of water quality sampling station(s).
 - x. Areas where final stabilization has been accomplished and no further construction-phase requirements apply.

G. Pre- and Post-dredge Perimeter Sediment Sampling

1. In order to determine what, if any, effects removal and construction activities have had on adjacent (perimeter) sediments, a series of grab samples will be collected both before the commencement of dredging and after the final cover has been placed. Grab samples (0-10 cm in depth) will be collected at 5 locations 50 to 75 feet to the east, north and south of the removal boundaries of the T-117 EAA (Section 5.4.2 and Appendix D of the Design Report). These samples will be analyzed for total PCB (Aroclors), PAHs, phenol, dioxins/furans, arsenic, total organic carbon, total solids, and grain size. The results will be documented in the Removal Action Completion Report and will not be used to trigger additional actions. Any changes to this sampling/testing must be approved by EPA.

H. Emergency/Contingency Measures:

1. T-117 will develop a spill prevention and containment plan (Pollution Prevention Plan in the RAWP) for this project, and shall have spill cleanup materials and an emergency call list available on site.
2. Any work that is out of compliance with the provisions of 401 Memo, or conditions causing distressed or dying fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these occur, the Applicant or operator shall immediately take the following actions:
 - a. Cease operations that are causing the compliance problem.
 - b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
 - c. In the event of finding distressed or dying fish, the applicant shall collect fish specimens and water samples in the affected area within the first hour of the event. These samples shall be held in refrigeration or on ice until the applicant is instructed by EPA on what to do with them. EPA may require analyses of these samples before allowing the work to resume.
 - d. In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled material and used cleanup materials.
 - e. Immediately notify EPA's RPM Piper Peterson (206) 553-4951; peterson.piper@epa.gov.
 - f. Submit a detailed written report to EPA within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.
3. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills.

PREPARED AND APPROVED BY:



6/25/13

Erika Hoffman
Environmental Review & Sediment Management Unit

Date

cc:

Piper Peterson (EPA Remedial Project Manager)

Ravi Sanga (EPA)

Mahbub Alam (WA Dept. of Ecology)