

CONTAMINATED MATERIALS MANAGEMENT PLAN

Pulp/Tissue Mill Remedial Action Unit,
G-P West Site

Prepared for: Port of Bellingham

Project No. 070188-001-22 • June 19, 2014 Final



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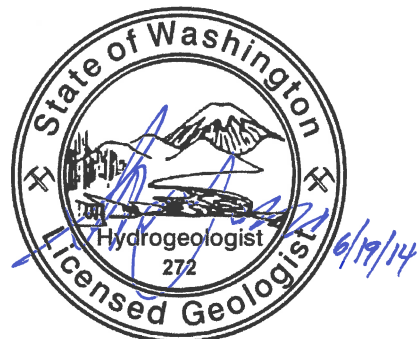
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1 Introduction

This Contaminated Materials Management Plan (CMMP) presents general procedures for handling and management of potentially contaminated materials (soil, debris, groundwater) generated by construction-related activities during redevelopment of the Pulp/Tissue Mill Remedial Action Unit (PTM RAU) within the Georgia-Pacific West Site (Site) in Bellingham, Washington (Figure 1).

The Site is being cleaned up under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D of the Revised Code of Washington, and the MTCA Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC). Cleanup of the PTM RAU in accordance with MTCA is legally required under a Consent Decree between the Port of Bellingham (Port) and Washington Department of Ecology (Ecology). Ecology's selected cleanup action is defined in their Cleanup Action Plan (CAP) for the PTM RAU (Ecology, 2014), which is an exhibit to the Consent Decree (CD). The cleanup action includes an environmental covenant(s) which requires that future activities within the RAU not compromise the protectiveness of the cleanup action defined in the CAP.

The PTM RAU is located within the Bellingham Waterfront District master-planned redevelopment area. It is anticipated that the Port will sell and/or lease property within the PTM RAU to entities for redevelopment, subject to the Waterfront District Subarea Plan (Port of Bellingham and City of Bellingham, 2013) and its development regulations. The environmental covenant(s) required by the CAP is legally applicable to the future Owners of properties within the PTM RAU including the Port.

A property owner or tenant (hereafter collectively termed "Proponent") conducting redevelopment-related activities on property within the PTM RAU will be required to comply with this CMMP and all other provisions of the CD and environmental covenant(s) so as to not interfere with the effectiveness of Ecology's selected cleanup action. Therefore, Proponents must integrate the provisions of this CMMP into their design specifications and implementation for future redevelopment-related projects anywhere within the PTM RAU. Proponents will also be responsible for securing any and all permits required for their redevelopment projects.

1.1 Purpose of this Document

This CMMP describes the procedures for managing contaminated materials (soil, debris, and water) encountered during all post-cleanup redevelopment-related activities (construction, maintenance, etc.) within the PTM RAU. Proper management of contaminated materials is necessary to ensure that future redevelopment-related activities are consistent with Ecology's CAP. Additional requirements may also be imposed on future redevelopment to comply with other regulatory programs or contract requirements.

Specific objectives of this CMMP specific to the PTM RAU are to:

- Provide a brief overview of environmental conditions and the selected cleanup action, with reference to documents providing additional detail;
- Define regulatory requirements for health and safety when workers are conducting activities that will encounter contaminated subsurface materials; and
- Provide protocols for managing contaminated materials generated during redevelopment-related activities to meet requirements of the CAP and applicable laws, regulations, ordinances, and permits.

By incorporating this CMMP into the CD for cleanup of the PTM RAU, future redevelopment-related activities covered under the CMMP and conducted consistent with the requirements of the environmental covenant(s) will be considered pre-approved by Ecology. However, prior notification to Ecology and the Port is required for all redevelopment activities that will breach the CAP-required surface cap and disturb potentially contaminated materials beneath it (Section 3.1 defines notification requirements).

An assumption inherent to this CMMP, consistent with the CAP, is that all subsurface materials within the entire PTM RAU are potentially contaminated, thus requiring an environmental surface cap across the entire RAU (RAU-wide cap) as a component of the cleanup action (described in Section 1.3). However, for a given redevelopment-related project, if supplemental environmental sampling and analysis performed by a Proponent demonstrates to Ecology's satisfaction that materials to be disturbed during the project are not contaminated relative to applicable cleanup standards, this CMMP's requirements for management of contaminated materials may not apply. However, any cleanup-related elements, including but not limited to the RAU-wide cap, that are disturbed by the Proponent's activities must be restored as needed to fully meet the remediation performance standards of the CAP (refer to Section 3.6). In addition, if an area is documented by a Proponent to be uncontaminated, contaminated materials from other areas cannot be placed there.

1.2 Description of PTM RAU

The Remedial Investigation (RI; Aspect, 2013) and Feasibility Study (FS; Aspect, 2014) for the Site identify low-level contamination throughout the entire PTM RAU, as well as the following localized contaminant areas (subareas) within the PTM RAU which are shown on Figure 1:

- Bunker C subarea;
- Dioxin-Contaminated Debris subarea (within the Bunker C subarea footprint);
- Acid Plant subarea; and
- LP-MW01 subarea.

Soils in the Bunker C subarea are impacted by carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and total petroleum hydrocarbon (TPH) in the Bunker C oil range, including non-aqueous-phase liquid (NAPL). In addition, dioxins/furans are a contaminant of concern in soils within a small portion of this area, which is designated the Dioxin-Contaminated Debris subarea. In late 2011, the Port conducted an interim action in the Bunker C subarea, which involved the excavation and off-site disposal of greater than 5,000 tons of TPH-impacted soil and debris from beneath the former Bunker C oil tank (excavation area denoted on Figure 1).

Soils in the Acid Plant subarea contain acidic pH and metals (including arsenic, cadmium, copper, mercury, and lead) at concentrations exceeding cleanup levels. Shallow groundwater in the immediate vicinity and downgradient of these soils is acidic and impacted by dissolved metals at concentrations of concern based on marine protection (Site groundwater is non-potable). The RI data indicate that the dissolved metals are mobile due to the low groundwater pH, and that metals concentrations and low pH attenuate naturally before the groundwater reaches the shoreline.

In the LP-MW01 subarea, vinyl chloride and tetrachloroethene (aka perchloroethene or PCE) were detected in shallow groundwater from a single monitoring well at concentrations of concern based on vapor intrusion (VI) and marine protection. Soil contamination above cleanup levels was not detected in this subarea, and the extent of contaminant migration in groundwater is extremely limited due to natural attenuation.

The RI also identifies metals at concentrations of concern based on marine protection in shallow groundwater in the general vicinity of the LP-MW01 subarea. The estimated extent of these elevated concentrations is labeled Miscellaneous Dissolved Metals Exceedances on Figure 1.

In addition, soil at scattered locations throughout the PTM RAU was found to contain contaminant concentrations (e.g., cPAHs, heavy metals) exceeding soil cleanup levels for unrestricted land use. Although it is possible that not all subsurface materials within the PTM RAU are contaminated, it is assumed for purposes of the CAP and this CMMP that they are contaminated (unless demonstrated otherwise by chemical testing), thus requiring proper management if disturbed.

The depth to groundwater within the PTM RAU ranges from 1 to 10 feet below ground surface and it varies with season and, near the Waterway, with the tides.

Detailed information regarding subsurface conditions and contaminant distribution is presented in the Site RI (Aspect, 2013). Specifically, Section 7 of the RI presents the conceptual site model for each subarea, which discusses contaminants of concern and their historical source(s), nature and extent of contamination, contaminant fate and transport, and environmental exposure pathways and receptors. In addition, the Bunker C Tank Interim Action Report (Aspect, 2012) describes the methods and results from that interim action cleanup.

1.3 Summary of Ecology's Selected Cleanup Action

Ecology's selected cleanup action for the PTM RAU consists of the following elements, as illustrated on Figure 2:

Soil Removal from the Bunker C Subarea. In addition to soils that were removed from beneath the former Bunker C Tank during the completed interim action, the cleanup action includes removal of all remaining soils with TPH concentrations exceeding 10,000 mg/kg (subarea-specific remediation level) from the Bunker C subarea.

RAU-wide Capping. Capping to control soil direct-contact exposure and soil erosion pathways will consist of a combination of existing pavement and building foundations, new buildings and pavement, and new soil caps. Much of the PTM RAU is currently capped with pavement and building foundations that, subject to long-term, ongoing inspection and maintenance, should provide the required isolation of underlying contaminated soil to achieve environmental protection. Integration of the existing RAU surfaces - with repair, replacement, and installation of new cap materials and erosion controls as needed to achieve protectiveness - will constitute the RAU-wide cap. When redevelopment-related activities modify these conditions such that cap protectiveness is compromised, new capping would need to be implemented.

Specific capping design will be presented in an Engineering Design Report as required by the CD; however, it is anticipated that new hard caps will be composed of a minimum 3 inches of concrete, asphalt, paving blocks, or building foundations. New soil caps will be composed of a minimum 24 inches of uncontaminated soil cover over a geotextile separation layer to distinguish the capping material from the underlying soil. Soil in the cap may include RAU soil confirmed to meet applicable soil cleanup levels as well as imported, uncontaminated soil.

Beyond the CAP requirements, the redevelopment plans for the PTM RAU include increasing grade elevation to mitigate the impact of potential sea level rise and to reduce the grade separation with the downtown Bellingham Central Business District. PTM RAU grading will be designed to maintain the required remediation performance standards, and will be integrated with redevelopment aesthetics and site drainage. Impacted soil from development projects may be temporarily stockpiled for a time period of up to 2 years, with subsequent reuse beneath new capping constructed within the project area or as part of other projects within the Site, subject to the provisions of this CMMP. All soil to be stockpiled temporarily for reuse will be managed to ensure protectiveness.

Ecology must approve reuse of any material that is placed on Site outside of the project area from which it is generated, based on chemical testing data for that material. In addition, material removed from the source area of the Acid Plant subarea (low-pH, metals-contaminated soil; Figure 1), requires chemical testing and Ecology approval prior to on Site reuse of that material.

Monitored Natural Attenuation (MNA) of Groundwater. MNA will be applied to address residual contamination in groundwater that exceeds applicable groundwater cleanup levels. Based on the RI data, cleanup level exceedances include selected metals and acidic pH in the Acid Plant subarea, PCE and vinyl chloride in the LP-MW01 subarea, and selected metals in the Miscellaneous Dissolved Metals Exceedances area. Contaminants are expected to continue to naturally attenuate through a combination of sorption, bioattenuation, volatilization, dispersion, and tidal mixing. The RI data indicate

that natural attenuation is effectively reducing concentrations of groundwater contaminants in each of these areas.

Contingent actions will be considered for implementation if MNA fails to restore groundwater at a reasonable rate and is determined by Ecology to not be protective of human health and the environment.

Institutional Controls. Following completion of the CAP-required cleanup construction, the Port and Ecology will develop an Institutional Controls Plan for the PTM RAU that includes environmental covenants in accordance with WAC 173-340-440 and RCW 64.70. It is anticipated that institutional controls will:

- Notify Proponents of the presence of residual contaminated materials, and regulate the disturbance and management of those materials and the cleanup action components;
- Require project specific design to reduce risk of creating preferential pathways for contaminant migration or run-off and sediment impacts to Whatcom Waterway (e.g., utility excavations or site grading);
- Prohibit extraction of groundwater for drinking or any other use. Groundwater extraction for construction dewatering is allowed, but that is not a beneficial use of water;
- Provide for long-term monitoring and stewardship of the cleanup action; and
- Require that VI potential be evaluated and/or VI controls constructed beneath future buildings in the LP-MW01 subarea if groundwater compliance monitoring indicates that vinyl chloride and PCE concentrations have not naturally attenuated to below cleanup levels in that subarea.

1.4 Residual Contaminants of Potential Concern

Data collected within the PTM RAU indicate that, following completion of the active cleanup measures, contaminants of potential concern (COPC) that will remain in soil at concentrations exceeding MTCA unrestricted cleanup levels include (Figure 1):

- An estimated 4,600 cubic yards (CY) of TPH-contaminated soil will remain in the Bunker C subarea;
- An estimated 100 CY of dioxin-contaminated soil will remain in the Dioxin-Contaminated Debris subarea; and
- An estimated 3,700 CY of soil with acidic pH and metals contamination will remain in the Acid Plant subarea.

In addition, soils in areas scattered throughout the 31-acre PTM RAU contain COPC concentrations exceeding soil cleanup levels for unrestricted land use. These soils occur from the existing ground surface down to an estimated average depth of 12 feet. This equates to an RAU-wide impacted soil volume of approximately 600,000 CY. Contaminants are assumed to be present beneath the RAU-wide cap in subsurface materials anywhere outside of soil excavation areas (Bunker C subarea) within the PTM RAU.

Groundwater contamination exceeding cleanup levels at the beginning of cleanup implementation includes (Figure 1):

- Acidic pH and dissolved metals covering an estimated 2.1 acres in the Acid Plant subarea;
- Dissolved vinyl chloride and PCE covering an area estimated at less than 0.1 acre in the LP-MW01 subarea; and
- Dissolved metals covering an area estimated at 2.5 acres in the Miscellaneous Dissolved Metals Exceedances area.

1.4.1 Subsurface Debris and Structures

Excavation or grading below the RAU-wide cap may encounter subsurface debris and structures associated with the former pulp and tissue mill. Such material may include foundation elements (footings, slabs, grade beams, pile caps, piles, etc.), utilities (stormwater catch basins and pipelines, water supply pipelines, sewer pipelines, etc.), and/or process components (pipelines, utility corridors, etc.). Subsurface debris and structures should be presumed to be impacted by the same contaminants as the immediately surrounding soil, and must be handled and managed consistent with the procedures prescribed in this CMMP. Structures that appear to be process components should be handled with greater care, as they may contain higher concentrations of contaminants.

Section 3.7 addresses procedures to be followed if redevelopment-related excavation activities encounter a previously unknown occurrence of hazardous substances.

2 Worker Health and Safety Requirements

Contractors conducting subsurface work within the PTM RAU are solely responsible for all matters relating to the health and safety of their employees and subcontractors while working within the RAU.

It is known that residual contamination exists in subsurface materials (soil, debris, and groundwater) throughout the PTM RAU, beneath the RAU-wide cap, at concentrations that may pose a risk to worker safety. Therefore, any contractor(s) conducting work that will disturb subsurface materials within the PTM RAU must prepare a Site Health and Safety Plan in accordance with OSHA 29 CFR 1910.120 and other applicable federal, state, or local laws or regulations.

Contractors' workers that engage in activities which could expose them to potentially hazardous substances, dangerous conditions, or other health hazards, must comply with 29 CFR 1910.120 and applicable federal, state, and local laws and regulations; this includes but is not limited to having the necessary health and safety training and performing work in accordance with their Site Health and Safety Plan and applicable regulations.

3 Requirements for Management of Contaminated Materials

This section describes the requirements that apply to any post-cleanup activities which breach the PTM RAU-wide cap and disturb underlying potentially contaminated materials. As stated in Section 1.1, if a Proponent demonstrates to the satisfaction of Ecology that materials to be disturbed during a project are not contaminated relative to applicable cleanup standards, this section's requirements for management of contaminated materials may not apply. This may include projects that disturb only future imported fill (assumed not contaminated) that is placed above the existing Site soil for redevelopment-related purposes, after completion of the cleanup action. If an area is documented by a Proponent to be uncontaminated, contaminated materials from other areas cannot be placed there. Any cleanup-related elements that are disturbed by the Proponent's activities must be restored as needed to fully meet the remediation performance standards of the CAP (refer to Section 3.6). In addition, construction best management practices (BMPs) – as required by applicable federal, state, and local laws, regulations, ordinances, and permits - will be required for any redevelopment-related activity on the PTM RAU, irrespective of whether they involve handling of contaminated materials.

Figure 3 presents a decision flowchart for management of materials generated by future redevelopment-related activities, which corresponds to the requirements of this section.

3.1 Notification

The Proponents will notify Ecology and the Port within 45 days before the beginning of any activity that will disturb the RAU-wide cap or underlying materials within the PTM RAU, or potentially create pathways for the migration of contaminated groundwater as described in Section 3.4. If Ecology determines the activity is not appropriate to be managed under this Plan, Ecology will notify the Proponents and Port and require approval prior to commencing the activity or construction of the project. The notification will include a written document submitted for Ecology review that describes the planned scope of the project, including but not limited to: how material excavated or graded from the project area will be managed including whether such materials are intended to be reused on Site; how water generated will be managed; whether subsurface drilling will be conducted; and whether existing monitoring wells will be disturbed. The notification document will also include any chemical testing data proposed to characterize material for reuse on Site, in accordance with Section 3.2.4 of this CMMP.

At the time of this document, contact information for Ecology and Port representatives is as follows:

Department of Ecology Northwest Regional Office
Cleanup Site Manager
Brian Sato
425-649-7000
bsat461@ecy.wa.gov

Port of Bellingham
Environmental Site Project Manager
Brian Gouran
360-676-2500
briang@portofbellingham.com

3.2 Management of Contaminated Materials

As described in Section 1.3, Ecology's selected cleanup action for the PTM RAU involves permanent removal of contaminant sources that pose a risk to human health or the environment via contaminant migration, plus an RAU-wide surface cap that provides protection from direct contact with and erosion of contaminated materials.

Proponents have options for managing potentially contaminated materials generated during their project-specific activities. Any material generated during redevelopment activities may be disposed of at a licensed and approved off-site disposal facility. Alternatively, the material may be beneficially reused within two years, as backfill/regrade material within the Site, as long as that material would not pose a risk to groundwater quality and it is capped in accordance with the CAP's remediation performance standards (reiterated in Section 1.3). Stockpiled soils must be disposed of at a licensed and approved off-site disposal facility after two years. Reuse assumes that the physical (e.g., geotechnical) characteristics of the material generated are suitable to meet the Proponent's project-specific requirements. Suitable barricades, fencing, signing and other warning and safety devices will be provided to limit access and protect the public and site workers from contaminated materials.

Soil generated from a defined project area may be subsequently reused within two years, beneath a new capping system within the same project area without additional chemical testing. Conversely, Ecology must approve reuse of any material that is placed on Site outside of the project area from which it is generated, based on chemical testing data for that material as described in Section 3.2.4 or as agreed to with Ecology during the project notification process (Section 3.1). In addition, material removed from the source area of the Acid Plant subarea (low-pH, metals-contaminated soil; Figure 1), requires chemical testing and Ecology approval prior to any reuse of that material on Site. The chemical testing requirements for that material are outlined in Section 3.2.4.

The on-site relocation of excavated contaminated material within the PTM RAU does not constitute generation of waste.

When construction, maintenance, or other redevelopment-related activities will disturb the RAU-wide cap and potentially contaminated materials under the cap, then the procedures outlined in the following subsections must be followed.

Section 3.7 addresses procedures to be followed if redevelopment-related excavation activities encounter a previously unknown occurrence of hazardous substances.

Note that procedures in this section apply to the material comprising the PTM's RAU-wide cap (e.g., pavement) as well as materials underlying the cap. For purposes of this CMMP, it is reasonably assumed that the material comprising the cap is not contaminated. As such, removed cap materials can be reused on site consistent with

provisions of this CMMP, or can be disposed of at a facility permitted to accept inert debris (construction and demolition landfill). Concrete or other cementitious material may not be reused in the subsurface on Site below the depth of the seasonally high groundwater table.

3.2.1 Erosion, Sedimentation, and Dust Control

When contaminated material is excavated, stockpiled, and handled, temporary erosion and sedimentation control (TESC) practices compliant with applicable state and local laws, regulations, ordinances, and permits must be followed.

In addition, construction BMPs must be implemented to minimize generation of dust throughout all handling of contaminated materials, in accordance with applicable state and local laws, regulations, ordinances, and permits.

3.2.2 Materials Handling On Site

Excavated materials to be managed on site temporarily must be stockpiled or placed into appropriate containers (e.g., covered roll-off boxes) while on site to avoid dispersal of potentially contaminated material via water (erosion) or wind. If material will be disposed of offsite, it may be directly loaded for transport to a permitted disposal facility. As required by the CAP, material generated by excavation or grading within the PTM RAU must either be placed beneath the RAU-wide cap or properly disposed of offsite within 2 years of its excavation/grading.

Stockpile Management

Stockpiles of potentially contaminated material must be constructed and maintained to prevent erosion, contact with stormwater runoff, dust generation, and worker contact. The water content of material to be stockpiled must be minimized to the extent practical prior to stockpiling to minimize drainage of free liquids from the stockpile.

Each stockpile must be underlain by a low-permeability liner with a minimum thickness of 10 millimeters (mil), and adjacent sheets of liner must be continuously overlapped by a minimum of 3 feet. The ground surface on which the liner will be placed must be free of any objects that could damage the liner. Alternatively, a layer of geotextile or plywood may be placed beneath the liner to protect it in locations containing rocks or debris on the ground surface, or in areas through which vehicular traffic will travel. A berm must be constructed around each stockpile or stockpile area. The berm must contain sufficient area and volume to allow for ponding and control of liquids within it.

Stockpiles must be covered when not in use. Stockpile covers must have a minimum thickness of 10 mils, and must be anchored as needed (e.g., sandbags) to prevent being removed by wind or other disturbance. Tears or discontinuities in the stockpile cover must be fixed immediately. Stockpiles must be inspected at least once per week to ensure they remain properly covered.

Water or other liquids accumulating within the stockpile area must be collected and disposed of in accordance with applicable federal, state, and local laws, regulations, ordinances, and permits (see Section 3.3).

3.2.3 Off-Site Disposal of Excavated Materials

Materials excavated from the PTM RAU may be disposed of at a permitted off-site facility. The disposal facility will have specific permit requirements for profiling the waste materials (through sampling and chemical analysis) that must be complied with before off-site transport and disposal is allowed. Note that, based on extensive characterization conducted during the RI, no environmental media within the PTM RAU have been identified as hazardous waste/dangerous waste under the state Dangerous Waste Regulations (Chapter 173-303 WAC).

Transport and off-site disposal of all waste materials generated from the PTM RAU must be conducted in accordance with Chapter 173-303 WAC and other applicable federal, state, and local laws, regulations, ordinances, and permits.

The property owner will be the generator for all waste materials generated on their property, in accordance with Chapter 173-303 WAC.

3.2.4 Chemical Testing Protocols and Criteria for On Site Material Reuse

As stated above, soil generated from a defined project area may be subsequently reused within two years, beneath a new capping system within the same project area without additional chemical testing. Conversely, chemical testing is required prior to on Site reuse of material generated from the source area of the Acid Plant subarea (Figure 1) or material that will be placed outside of the project area from which it is generated, based on chemical testing data. Chemical data used to characterize such material can include existing (RI/FS) data if representative of the location and material and/or new representative sampling and chemical analysis as described in this section.

To generate new chemical testing data, one representative 5-point composite sample must be collected for each 100 cubic yards of material, using industry-standard sampling practices for the material being sampled and the contaminants being analyzed for (listed below). The material may be sampled *in situ* (before excavation/grading) or sampled from a stockpile after excavation/grading. Each sample must have a unique identification number and, for each sample, the correlation between the identification number and the location from which it was collected must be recorded. The characterization soil samples must be submitted under chain-of-custody protocol to an analytical laboratory accredited by Ecology for the chemical analyses to be conducted.

New soil samples will be analyzed for contaminants of concern based on groundwater protection for the PTM RAU (addressing vapor intrusion and marine protection). Since all soil must be reused beneath a new cap, it is not necessary to test for contaminants that pose a risk only via soil direct contact (e.g., cPAHs). If new chemical testing is required as described above, the new soil samples must be analyzed for following groundwater contaminants of concern defined in the RI/FS:

- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
- Soil pH; and
- Chlorinated solvent volatile organic compounds (VOCs).

Table 1 presents soil screening levels¹ to assess suitability for on-Site reuse of material that requires additional chemical testing (described above). In accordance with MTCA, the groundwater-protection-based soil reuse screening levels for some contaminants are different for material located above the water table (unsaturated) versus below the water table (saturated) (Table 1).

Based on the chemical testing data, material with measured concentrations less than the soil reuse screening levels in Table 1 will be acceptable for reuse beneath a cap on Site.

Based on the chemical testing data, materials with detected concentrations greater than the soil reuse screening levels will be disposed of offsite in accordance with Section 3.2.3. However, if concentrations detected in the material are greater than the soil reuse screening levels, the Proponent may determine and present for Ecology approval alternative area-specific soil concentrations protective of groundwater by applying the other MTCA methods presented in WAC 173-340-747 (e.g., use of leaching tests, calculation of a dilution/attenuation factor to apply in the 3-phase leaching model, and use of empirical groundwater data). Materials determined to be protective of groundwater by these methods are acceptable for reuse beneath the RAU-wide cap.

The chemical testing information must be submitted to Ecology for their review and written opinion regarding suitability of the tested material for its intended reuse purpose (e.g., above or below the water table etc.). No excavated material for which chemical testing is required may be placed on Site without Ecology written approval regarding its reuse suitability.

3.3 Water Management

Redevelopment-related activities generating water include but are not limited to construction dewatering (groundwater withdrawal), stormwater runoff from work areas including soil stockpile areas, drainage from stockpiles, and water from cleaning equipment. All water generated by redevelopment-related activities must be characterized, handled (captured, pumped, stored, treated, conveyed, etc.), and discharged in compliance with federal, state, and local laws, regulations, ordinances, and permits. Water generated during redevelopment-related activities may not be discharged or allowed to flow onto the ground surface, to the Whatcom Waterway, or off the site, except as allowed by permit.

3.4 Preventing Groundwater Contaminant Migration

The Proponent's redevelopment-related activity must not create or facilitate migration of contaminated groundwater within or from the areas depicted on Figure 1 (Acid Plant subarea, LP-MW01 subarea, Miscellaneous Dissolved Metals area). Specific redevelopment-related activities that would require additional design considerations if planned within those areas include but are not limited to:

¹ Soil reuse screening levels are soil concentrations based on leaching to groundwater applying MTCA-default assumptions and adjusted for background metals concentrations and analytical practical quantitation limits (PQL); refer to Section 5 of RI for details regarding screening level derivation.

- Construction of subsurface utilities extending beneath the water table. Any such utility corridors would need to be backfilled in a manner so as to not serve as a preferred pathway for groundwater migration (e.g., backfill with low-permeability material such as controlled density fill [CDF]); and
- Construction of stormwater infiltration facilities that create focused groundwater recharge and thus change the local groundwater flow directions or velocity. Diffuse infiltration that would not substantively change groundwater flow directions or velocity in those areas is acceptable and would not require specialized design measures.

The required prior notification to the Port and Ecology (Section 3.1) must describe any such redevelopment-related features or activities considered within the defined areas of groundwater contamination, along with the design measures to be implemented to prevent migration of contaminated groundwater.

3.5 Subsurface Drilling and Well Decommissioning

Drilling into materials beneath the RAU-wide cap may be necessary for geotechnical or environmental characterization of subsurface conditions in support of future redevelopment projects within the PTM RAU. All drilling within the PTM RAU is subject to applicable state and local laws, regulations, ordinances, and permits. Drinking water supply wells are not allowed to be installed or operated within the PTM RAU under the CAP-required environmental covenant.

The Port and Ecology contacts identified in Section 3.1 must be notified if redevelopment-related activities will disturb any monitoring wells within the PTM RAU.

Any monitoring well rendered inoperable by redevelopment-related activities must be properly decommissioned in accordance with the state's Minimum Standards for Construction and Maintenance Wells (Chapter 173-160 WAC). Any monitoring well that needs to be disturbed for redevelopment-related activities but is required to remain operable to meet CAP requirements as determined by Ecology, must be repaired or replaced to restore its pre-existing function and meet requirements of Chapter 173-160 WAC.

Any CAP-required cleanup element, including but not limited to the RAU-wide cap, that is disturbed by drilling or well decommissioning activities must be restored in accordance with Section 3.6. In no case may the portion of a decommissioned boring or monitoring well that penetrates the RAU-wide cap be of a quality inferior to that of the cap prior to disturbance. In addition, the surface finish for any subsurface exploration (whether an operable monitoring well or decommissioned boring/well) must match the surrounding finish grade unless otherwise approved by Ecology.

Drill cuttings, water, or other materials produced from subsurface drilling or monitoring well decommissioning within the RAU are subject to the same requirements as other potentially contaminated materials and water produced in the RAU as specified in this CMMP and subject to applicable regulations.

3.6 Restoration of CAP-Required Cleanup Elements

Any cleanup element required by the PTM RAU CAP, including but not limited to the RAU-wide cap, which is disturbed by future investigation, construction, maintenance, or other activities must be restored to fully meet the remediation performance standards of the CAP (reiterated in Section 1.3) as soon as possible after the disturbance. Written documentation of disturbance and restoration of CAP-required cleanup elements must be provided to Ecology for review and approval that the CAP requirements are met.

3.7 Management of Material with Previously Unknown Hazardous Substances

If the Proponent encounters a previously unknown occurrence of hazardous substances at concentrations greater than applicable cleanup levels and those materials possess field-screening indications of gross contamination (e.g., odor or presence of visible non-aqueous phase liquid (NAPL)), then the Proponent must notify Ecology and the Port contacts in Section 3.1 of the occurrence within 3 business days. Hazardous substances known to exceed cleanup levels within soil or groundwater of the PTM RAU include petroleum hydrocarbon, metals, VOCs, PAHs, dioxins/furans, and acidic pH. Aspect (2013) and Aspect (2014) provide additional details regarding hazardous substances within the PTM RAU, and are incorporated here by reference.

After notifying the Port and Ecology, such materials excavated for project purposes must be segregated and managed separately from materials without indications of gross contamination. Excavated materials with indications of gross contamination must be either: (1) properly profiled and disposed of off site in accordance with procedures identified in Section 3.2.3; or (2) sampled to characterize the contamination as described below, and the information presented to Ecology for their determination on its suitability for on-site reuse beneath the RAU-wide cap.

To chemically characterize material containing gross contamination for potential on-site reuse, one representative 5-point composite sample will be collected for each 20 cubic yards of material with indications of gross contamination, using industry-standard sampling practices for the material being sampled and the contaminants being analyzed for (listed below). The material may be sampled *in situ* (that is, before excavation/grading) or sampled from a stockpile after excavation/grading. Each sample must have a unique identification number and, for each sample, the correlation between the identification number and the stockpile or *in situ* location from which it was collected must be recorded. Characterization soil samples must be submitted under chain of custody to an Ecology-accredited analytical laboratory for the following chemical analyses:

- Diesel-range and oil-range petroleum hydrocarbons (by NWTPH-Dx method with silica gel pretreatment);
- VOCs by EPA Method 8260; and
- The metals arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc (by EPA Methods 6000 and 7000).

ASPECT CONSULTING

The list of analyses may be revised based on field screening or other information.

Based on the chemical testing data, excavated material with measured concentrations less than the soil reuse screening levels in Table 1 will be acceptable for reuse beneath a cap on Site.

Based on the chemical testing data, excavated materials with detected concentrations greater than the soil reuse screening levels will be disposed of offsite in accordance with Section 3.2.3. However, if concentrations detected in the material are greater than the soil reuse screening levels, the Proponent may determine and present for Ecology approval alternative area-specific soil concentrations protective of groundwater by applying the other MTCA methods presented in WAC 173-340-747 (e.g., use of leaching tests, calculation of a dilution/attenuation factor to apply in the 3-phase leaching model, and use of empirical groundwater data). Materials determined to be protective of groundwater by these methods are acceptable for reuse beneath the RAU-wide cap.

The chemical testing information must be submitted to Ecology for their review and written opinion regarding suitability of the tested material for its intended reuse purpose (e.g., above or below the water table etc.). No excavated material for which chemical testing is required may be placed on Site without Ecology written approval regarding its reuse suitability.

4 References

- Aspect, 2012, Bunker C Tank Interim Action Report, Georgia-Pacific West Site, Bellingham, Washington, February 24, 2012.
- Aspect, 2013, Remedial Investigation, Georgia-Pacific West Site, Bellingham, Volume 1 of RI/FS, August 5, 2013.
- Aspect, 2014, Feasibility Study, Pulp/Tissue Mill Remedial Action Unit, Vol. 2a of RI/FS, Georgia-Pacific West Site, Bellingham, Washington, May 2, 2014.
- Ecology, 2014, Cleanup Action Plan, Pulp/Tissue Mill Remedial Action Unit, Georgia-Pacific Site, Bellingham, Washington, June 2014.
- Port of Bellingham and City of Bellingham, 2013, The Waterfront District Draft Sub-Area Plan, 2013.

TABLE

Table 1 - Soil Screening Levels for Reuse of Material

Contaminated Materials Management Plan, Pulp/Tissue Mill RAU, GP West Site

Contaminant of Concern	Soil Reuse Screening Level Based on Groundwater Protection (mg/kg)	
	Unsaturated Soil (above water table)	Saturated Soil (below water table)
Metals		
Arsenic	20	20
Cadmium	1.2	1
Chromium (Total)	5,200	260
Copper	36	36
Lead	250	81
Mercury	2	0.1
Nickel	48	48
Zinc	100	85
Volatile Organic Compounds (Chlorinated Solvents)		
cis-1,2-Dichloroethene (DCE)	2.5	0.14
Tetrachloroethene (PCE)	0.3	0.015
Trichloroethene (TCE)	0.056	0.005
Vinyl chloride	0.006	0.005
Conventionals		
pH (in Standard pH Units)	<2.5 or >11.0	<2.5 or >11.0

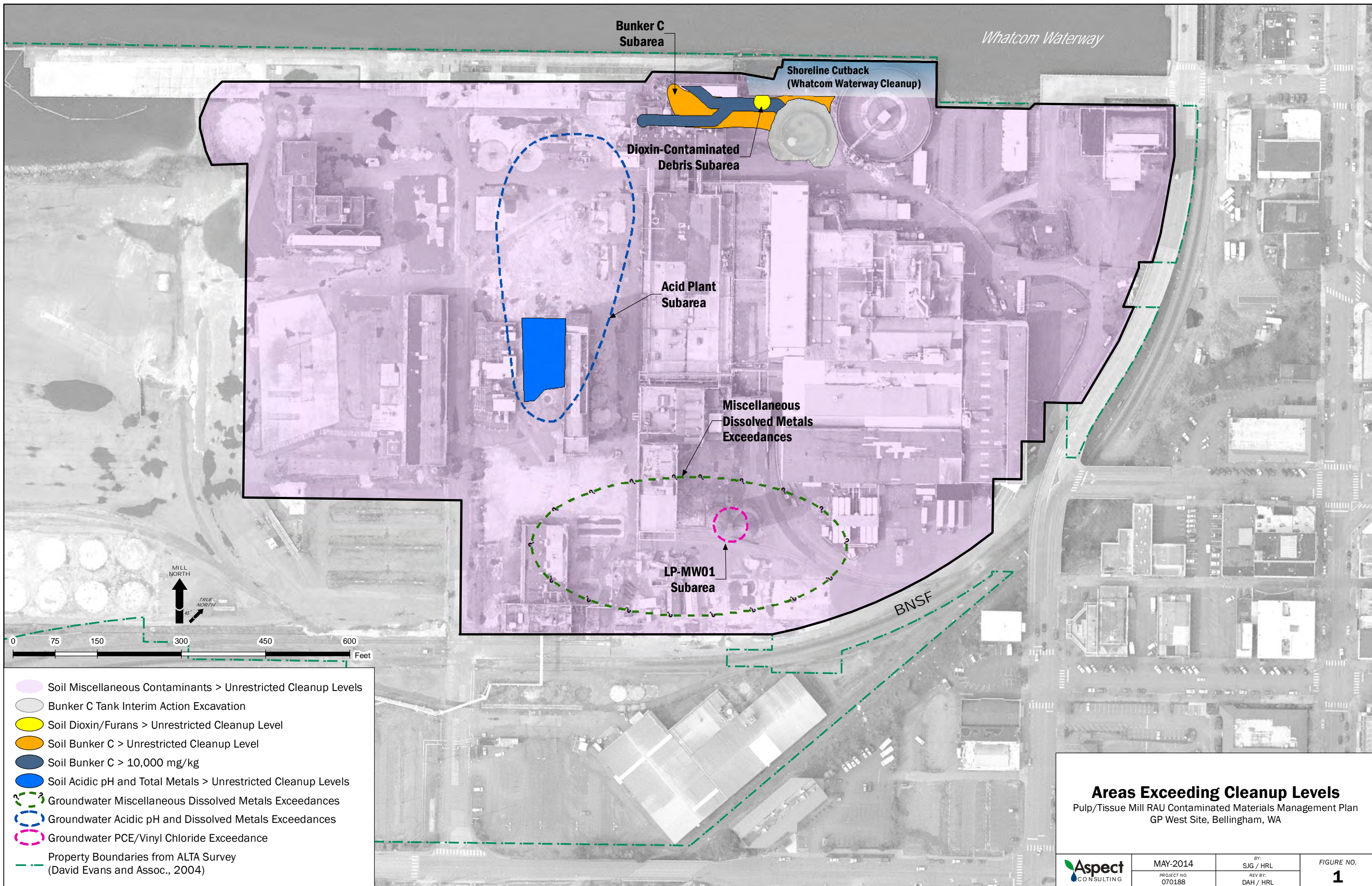
Notes:

mg/kg: milligrams per kilogram.

These screening levels apply to material that is either (1) generated from the source area of the Acid Plant subarea and intended for reuse anywhere on Site, or (2) intended for reuse on Site outside of the project area from which it is generated.


If detected concentrations in material intended for reuse exceed these screening levels, alternative methods for determining concentrations protective of groundwater (per WAC 173-340-747) may be applied for reuse suitability assessment (see Section 3.2.4).

FIGURES

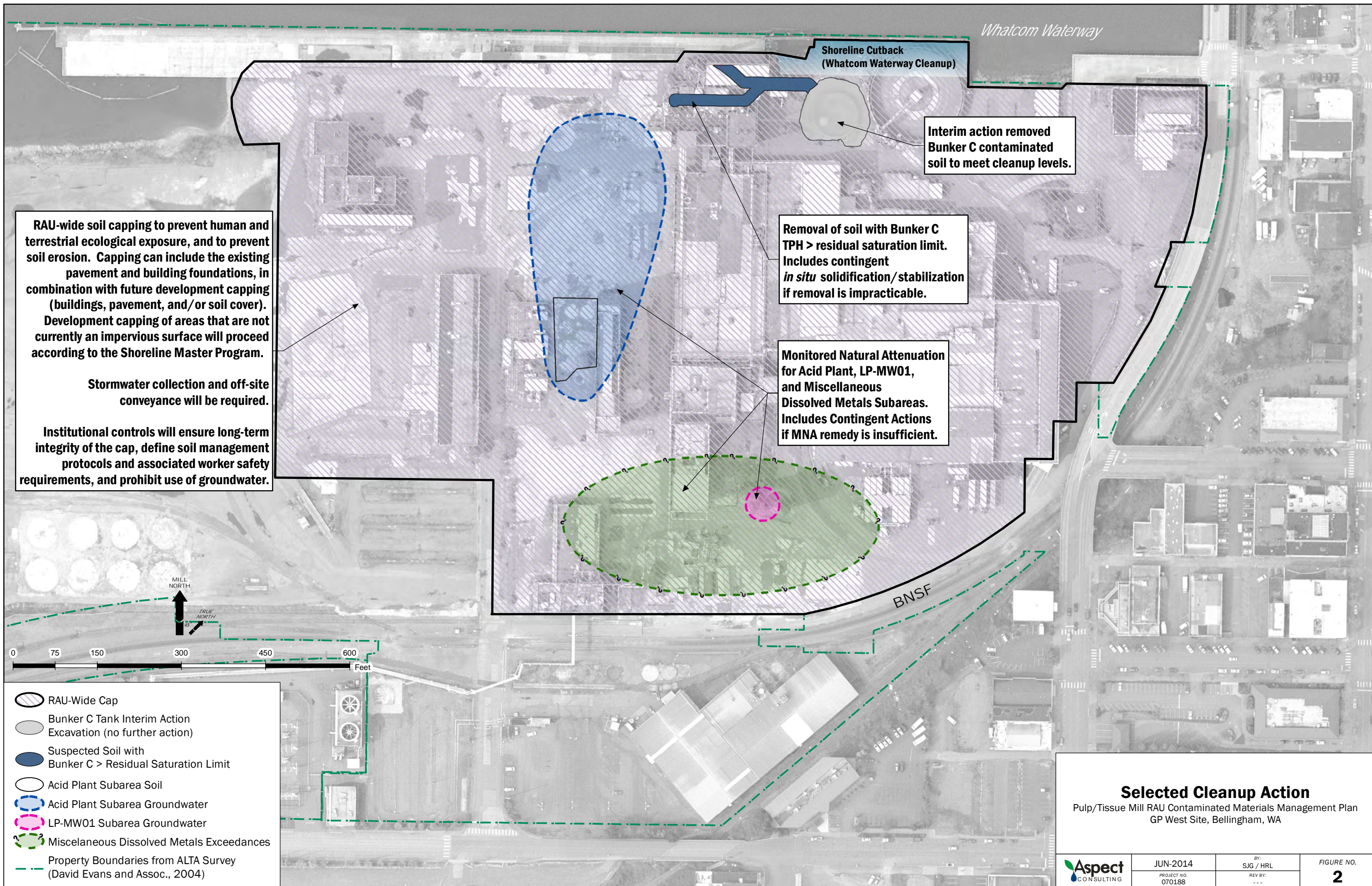


- Soil Miscellaneous Contaminants > Unrestricted Cleanup Levels
- Bunker C Tank Interim Action Excavation
- Soil Dioxin/Furans > Unrestricted Cleanup Level
- Soil Bunker C > Unrestricted Cleanup Level
- Soil Bunker C > 10,000 mg/kg
- Soil Acidic pH and Total Metals > Unrestricted Cleanup Levels
- Groundwater Miscellaneous Dissolved Metals Exceedances
- Groundwater Acidic pH and Dissolved Metals Exceedances
- Groundwater PCE/Vinyl Chloride Exceedance
- Property Boundaries from ALTA Survey (David Evans and Assoc., 2004)

Areas Exceeding Cleanup Levels
 Pulp/Tissue Mill RAU Contaminated Materials Management Plan
 GP West Site, Bellingham, WA

	MAY-2014 PROJECT NO. 070188	BY: SJG / HRL REV BY: DAH / HRL	FIGURE NO. 1
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RAU-wide soil capping to prevent human and terrestrial ecological exposure, and to prevent soil erosion. Capping can include the existing pavement and building foundations, in combination with future development capping (buildings, pavement, and/or soil cover). Development capping of areas that are not currently an impervious surface will proceed according to the Shoreline Master Program.

Stormwater collection and off-site conveyance will be required.

Institutional controls will ensure long-term integrity of the cap, define soil management protocols and associated worker safety requirements, and prohibit use of groundwater.

Shoreline Cutback (Whatcom Waterway Cleanup)

Interim action removed Bunker C contaminated soil to meet cleanup levels.

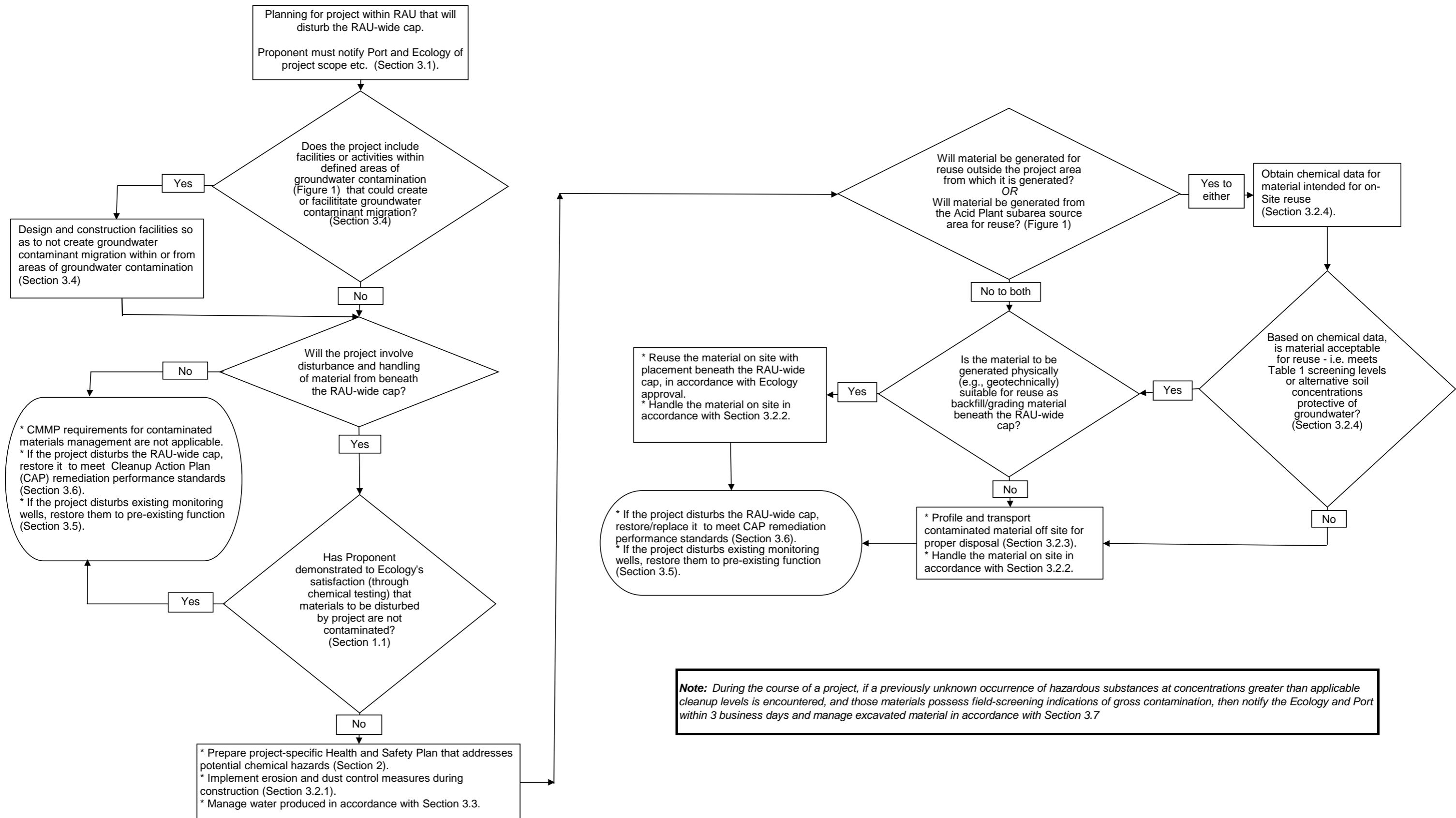
Removal of soil with Bunker C TPH > residual saturation limit. Includes contingent *in situ* solidification/stabilization if removal is impracticable.

Monitored Natural Attenuation for Acid Plant, LP-MW01, and Miscellaneous Dissolved Metals Subareas. Includes Contingent Actions if MNA remedy is insufficient.

- RAU-Wide Cap
- Bunker C Tank Interim Action Excavation (no further action)
- Suspected Soil with Bunker C > Residual Saturation Limit
- Acid Plant Subarea Soil
- Acid Plant Subarea Groundwater
- LP-MW01 Subarea Groundwater
- Miscellaneous Dissolved Metals Exceedances
- Property Boundaries from ALTA Survey (David Evans and Assoc., 2004)

Selected Cleanup Action
Pulp/Tissue Mill RAU Contaminated Materials Management Plan
GP West Site, Bellingham, WA

	JUN-2014	BY: S/JG / H/RL	FIGURE NO. 2
	PROJECT NO. 070188	REV BY: ...	



Note: During the course of a project, if a previously unknown occurrence of hazardous substances at concentrations greater than applicable cleanup levels is encountered, and those materials possess field-screening indications of gross contamination, then notify the Ecology and Port within 3 business days and manage excavated material in accordance with Section 3.7